



# Mod.Brane 11

Euro-Rack Analog Membrane Synthesizer Module

## Operating Manual

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## Introduction

Thanks for using the JoMoX Mod.Brane 11! The Mod.Brane 11 is a great sounding, dedicated percussion module with a real analog sound production made for installation in 19 inch euroracks as offered by companies like Doepfer GmbH for instance.

Actually it is a single voice storeable analog synthesizer which is optimized to produce professional percussion and snaredrum-like sounds. The Mod.Brane 11 module is fully controllable by CV (control voltage) / Gate as well as via Midi. The module can also be triggered by a drumpad piezo or an external audio signal. All jacks are being made as 3.5mm mini jacks which is the standard in eurorack world. You can find suitable cables in the accessories of many eurorack modular system producing companies.

The usage is fairly simple and self-explaining at most points. Nevertheless, we recommend to study this manual intensively in order to explore the manifold musical possibilities of the Mod.Brane 11 as quickly as possible.

Before we start just some important safety instructions:

- Please use the Mod.Brane 11 only in dry rooms. Please never let fluids or humidity penetrate to the device!
- The module is only made for use in so-called eurorack modular systems. A 16 pin ribbon cable for the connection to the Doepfer system bus with +/-12V is added. The supply voltages may not exceed +/- 15Volts. Although there are protection diodes inside against wrong polarity we have to warn you about wrong installation as severe damage may happen to the device! On a damage caused by wrong installation or modification of supply pins the warranty is void.
- For cleansing of the Mod.Brane 11, please use a slightly damp cloth, never solvents or agents!
- The Mod.Brane 11 is a complex electronic device and should therefore be treated carefully!

If any damages or malfunctions occur, please immediatly turn off the rack, take the module out of the rack and contact your local music dealer or send an email to [mail@jomox.de](mailto:mail@jomox.de).

## 1. Installation

Please turn off the euro rack prior to the wiring! On the backside of the Mod.Brane 11 module you can find these connections:

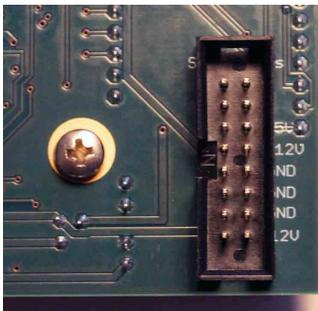


## 1.1. Installation in the eurorack

Please connect the supplied ribbon cable to the eurorack system bus rails as shown on the picture. The module needs +/-12 Volts at a supply current of maximum 140mA on +12V and about 80mA on -12 Volts. The optional 5 Volts and the CV/Gate on the A-100 Doepfer bus are both not wired inside the Jomox modules and not needed. Other 10 pin systems may be used as well if only the lower part of the 16 pin connector is connected. Please pay attention for the position of the voltages and the ground pins! There are protection diodes inside the modules but please take extra care to protect the rack and the module!

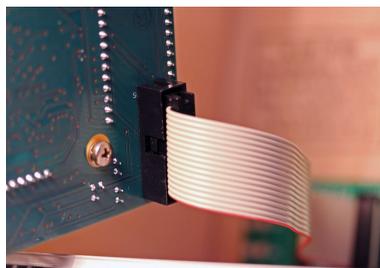


A-100 Doepfer bus. (The Doepfer GmbH enterprise and all of their shown products are registered trademarks. With friendly approval of Doepfer Musikelektronik GmbH)



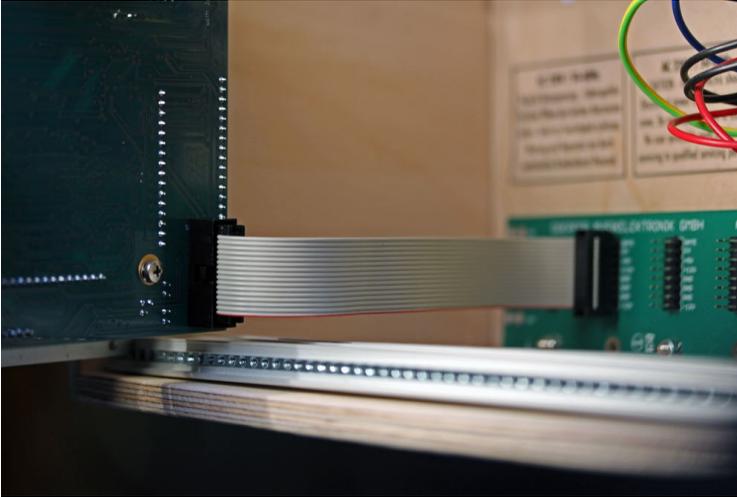
Jomox ModBase 09/ModBrane 11 euro rack supply connector. Please connect the power supply of the eurorack system bus *here*.

**Attention: DO NOT connect, under any circumstances, the power supply cable to the Jomox Inter-D-module bus!!! The rack power supply and the module could get seriously damaged!**

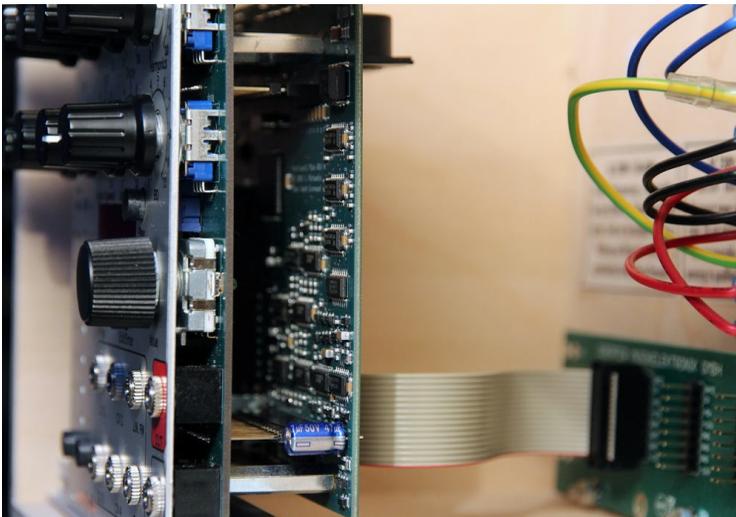


Connect the other end of the ribbon cable to the module as shown on the picture. The cables are fairly short which is good in electrical means to the relatively high power consumption of the module.

Don't flip the cable but connect it as shown on the picture.



Then please mount the module on the rack rails with the supplied metric M3 screws. In case you want to connect a midi cable, please do this beforehand of mounting.



## 2. Front connections



### 2.1. CV1-CV4

The inputs CV1-CV4 are programmable CV control inputs. In a modular system, most functions and parameters like eg. VCO pitch or filter cutoff can be controlled by a CV (control voltage). In the Mod.Brane 11, practically all internal sound parameters can be controlled (i.e. modulated) by an assignable CV. The modulation amount can be controlled by software, either positively as negatively. More information you can find in chapter 5.5 CV control.

These CV inputs can process 0-5 Volts. Higher or negative voltages are blocked inside and will not cause damage, but they won't get processed anyway.

## **2.2. LIN.FM**

Linear FM CV input. This connection serves to modulate both the F-OSC membrane oscillators and works on the pitch (FM = frequency modulation). The LIN.FM CV input is just analogue and can't be controlled by software. Therefore it works over the entire audio range and the frequency resolution is not limited by the sampling rate of the CPU. Since the input has no amount knob, one should put an attenuator (it may be passive, means a potentiometer) into the signal chain because otherwise modulation occurs at full intensity of the modulating signal (eg. LFO). This input processes also negative voltages.

## **2.3. Gate**

The gate input of a typical modular environment is the input which is used to trigger the tone of the Mod.Brane 11. Opposing to the Trig input the Gate input can trigger the signal only without dynamics (on/off). The typical gate high signals used in modular world have normally 5-15 volts, which the gate input of the Mod.Brane 11 can process without any problems – the threshold is at about 1 volts. The gate polarity can be inverted by software too. Furthermore, some modular systems use a special kind of triggering called S-trig (switch trigger) which the Mod.Brane 11 can do as a software feature too. In this case the triggering is excited if the tip (hot wire) and ring (=ground) of the gate cable plug are shorted – be it electrical by a transistor or mechanical by a simple switch.

## **2.4. Trigger**

The Trig input is used to trigger the Mod.Brane 11 by a drumpad piezo pickup or an audio signal. Connect the Trig input to an audio source like a mixer output, cd-player or dynamic microphone. The input is dynamic and can process the velocity. In general, the Trig input is optimized for piezo pickups and useful for live drummers who want to use the Mod.Brane 11 as a drum enhancement for instance.

How to change the threshold or dynamics is described in chapter 6.3 Trig Sens.

## 2.5. Out

Audio output signal of the Mod.Brane 11. The output is unbalanced and has a maximum level of about +20 dBu, so it can be very loud and may overdrive high gain inputs. Therefore connect the audio output with an appropriate attenuator/mixer or amplifier.

## 3. General functions

### 3.1. Preset selection

< P00-P99 >

As long none of the 8 menu LEDs is lit, the Mod.Brane 11 is in preset mode. Now you can choose one of 100 preprogrammed presets by turning the value input wheel. The sounds get loaded automatically.

By hitting the play button the sounds can be manually triggered and heard.

### 3.2. Menu control



The Mod.Brane 11 has an up/down menu with 8 rows and 3 pages which are shown by multi-colored LEDs.

Please use the arrow buttons to enter the menu and to select the desired menu item and the page button to switch between the three pages green (left printing), orange (right printing) and red (right printing).

Repeated pressing of the page button switches first from green to orange, then to red and then in opposite direction backwards.

Some pages do have 4 pages (eg. Met Nze) which is shown by blinking of the red LED.

If you press the page button whilst the menu is inactive you step automatically to LFO 1 menu (menu 1 orange). This was made because the LFO is an important function and shares the three lower potentiometers with the other sound parameters. In order not to be forced to press two buttons first you can enter the LFO 1 menu by just pressing the page button.

With all other menu functions the value gets edited by the value input wheel (alpha dial).

### Summary of menus

Green	Orange	Red	Red blinks
Midi Ch	LFO 1	LFO 2	
Split Mode	Gate Time	Preset Init	
Trig Sens	Trig Dynamic	Noise Filter	
Gate Mode	Metal Noise 1	Metal Noise 2	Bit Mask 2
Volume	CV 1 Dest	CV 1 Amt	
Bus Vol	CV 2 Dest	CV 2 Amt	
Bus Send	CV 3 Dest	CV 3 Amt	
Store	CV 4 Dest	CV 4 Amt	

### **3.3. Midi control**

#### **3.3.1. Note trigger**

The Mod.Brane 11 processes midi note commands. It can be triggered by any midi sequencer. If the Mod.Brane 11 receives midi data on the selected channel, the leftmost decimal point in the display lights up. Please find the settings of the various midi functions in chapter 7 Midi Implementation.

#### **3.3.2. Parameter control via Midi controllers**

All sound parameters can be remotely controlled by continuous midi controllers (CCs). The controller map can be found in the Midi Implementation at the end of this operating manual.

### **3.4. Triggering via CV/Gate**

Please connect a typical modular gate/trigger CV sequencer (like eg. the Doepfer A-155) to the Gate jack. The Mod.Brane 11 processes gate signals from 0..1 volts to 0..15 volts. To get retriggered, the signal must at least once drop below the trigger threshold, which is a little below 1 volts. If the module is triggered, the second decimal dot next to the second digit of the display flashes up. The gate input triggers always with maximum velocity and has no dynamics. It is strongly recommended to use the GATE input for triggering via a modular sequencer or any other gate-like signals like LFOs!!

### **3.5. Triggering via TRIG**

The jack TRIG is an analog input which allows for triggering the Mod.Brane 11 by a drumpad piezo or audio signal. The trigger input is dynamic and provides attack velocity. It works in parallel to the Midi and Gate trigger, i.e. it allows for playing notes on the keyboard, triggering by a sequencer via gate and triggering by a drum pad at the same time. Also one could play it via Trig in and change sound parameters via Midi CC at the same time. If the Trig input of the Mod.Brane 11 receives a signal, the decimal point next to the second digit of the display flashes up.

## 4. Sound parameters (potentiometers)



In order to enter the edit mode, please press <Edit/Enter>. A dot right down in the display lights up indicating that you are in edit mode. Now turn one of the knobs and you will see a value in the display and hear the change of sound.

If you press <Edit/Enter> again, the edit mode indicator dot is lit weaker. This is the fine tune mode. Since the whole adjustable range is very large (almost the entire audio range) you have the ability to control the pitch of the membrane oscillators much finer. Whilst hitting the <Edit/Enter> button the second time, the current coarse value is defined as the new center value of the fine tune mode.

If you don't want sound parameters to be changed by unwanted knob movements, press <Edit/Enter> once again to leave the edit mode. The edit mode indicator dot fades.

The Mod.Brane 11 has a dedicated potentiometer knob for the 8 most important parameters. Some sound parameters are only being changed via the LED menu and the incremental wheel though. There is a double assignment for the three knobs in the lower row for the settings of the LFOs.

#### **4.1. M1 Pitch**

**< 000-252 >**

This parameter controls the pitch of the first membrane oscillator M1 (F-OSC). The range goes from about 25Hz to 14kHz.

Please note that the pitch is also little affected by the settings of M1 Dampen and both coupling parameters 1\_2 Couplg and 2\_1 Couplg. Because of the sensitive analog circuitry, these values interfere each other a little bit so that re-adjustment of values may be necessary to achieve a special sound.

#### **4.2. M1 Dampen**

**< 000-252 >**

By the parameter M1 dampen you change the decay of sound, means the dampen of F-OSC M1. If turned up, M1 fades longer and becomes a steadily vibrating oscillator. A low value lets the F-OSC M1 decay very short.

#### **4.3. M2 Pitch**

**< 000-252 >**

This parameter controls the pitch of the second membrane oscillator M2 (F-OSC). The range goes from about 25Hz to 14kHz. Other than that, the same qualities yield like in 4.1. M1 Pitch described.

#### **4.4. M2 Dampen**

**< 000-252 >**

By the parameter M2 Dampen you change the decay of sound, means the dampen of F-OSC M2. Other than that, the same qualities yield like in 4.2. M1 Dampen described.

#### **4.5. 1\_2 Couplg**

**< 000-252 >**

This parameter determines the coupling between M1 and M2. As mentioned in the general functional description, you can simulate the actions of two coupled membranes in a real drum. The parameter 1\_2 Coupling adds a part of the bandpass output of M1 to M2 and performs a little bit frequency modulation too.

#### **4.6. 2\_1 Couplg**

**< (-128)-124 >**

This parameter determines the coupling between M2 and M1. This value can be either positive or negative. This controls at which phase (+/-) the bandpass signal is coupled (added) from M2 into M1.

Zero is the initial setting at which no interference occurs. If both coupling parameters have the same sign, they gain each other and create a feedback vibration of both F-OSC which sometimes can result in scream-like sounds if both F-OSCs have the same pitch or are in an octave or 5th relation. At opposing signs, they attenuate each other. Like 1\_2 Coupling, 2\_1 Coupling performs a little frequency modulation M2 -> M1 too.

By playing with these two parameters you can create those wave interferences and interactions that are characteristic for membrane-like percussion sounds.

#### **4.7. Noise**

**< 000-252 >**

The noise signal creates the snare drum noise or metallic attacks. The parameter Noise controls the intensity of this signal. As can be seen in Pic.1, the noise signal is processed by a noise envelope and is then mixed into the F-OSC network and a small portion into the final VCA.

In the F-OSC network, the noise mixes up with the hit (trigger pulse) and the F-OSC sounds in a similar way like in a real snare drum and reaches a fairly homogeneous sound. If Noise is cranked up too much (>180) it may lead to internal distortions that might be desired though. Also the level and sound of the noise is affected by the noise filter settings too(see 5.3 Noiz Fil).

The noise may be either random white noise (MetNze 1 = <noi>) or metallic noise made up by thousands of combinations of MetNze 1 and/or MetNze 2.

#### **4.8. Decay**

**< 000-252 >**

Controls the decay time (length) of the Mod.Brane 11. As can be seen in chapt. 6.9 functional description Pic.1, this value controls either the noise envelope and the final VCA envelope. The noise envelope is always shorter than the final VCA envelope in order to adjust the noise attacks precisely, whilst the decay of F-OSC M1 and M2 are mostly controlled by parameter Dampen.

## 5. Sound parameters (menu orange/red)

### Summary of menus

Green	Orange	Red	Red blinks
Midi Ch	LFO 1	LFO 2	
Split Mode	Gate Time	Preset Init	
Trig Sens	Trig Dynamic	Noise Filter	
Gate Mode	Metal Noise 1	Metal Noise 2	Bit Mask 2
Volume	CV 1 Dest	CV 1 Amt	
Bus Vol	CV 2 Dest	CV 2 Amt	
Bus Send	CV 3 Dest	CV 3 Amt	
Store	CV 4 Dest	CV 4 Amt	

### 5.1. LFO

Use the up/down buttons and go to **LFO**.

Choose page 2 (LED lights up orange) by pressing the Page button so that the display shows LM1.

As long as you are in preset selection mode (no menu) you can just press the page button and you will enter the LFO 1 menu directly. This was made in order to quickly edit the LFO section whilst tweaking the knobs and to flip between both areas.

#### 5.1.1. LFO 1 Wave < SuP / Sdo / Sin / Si- / tri / tr- / rCt / rC- >

Now turn potentiometer 5 (1\_2 Coupl, **Wave**) to change the waveform of LFO 1. The value is shown in the display. LFO 1 always works firmly on the pitch of membrane M1.

With the LFO (Low Frequency Oscillator) you can produce periodic low frequency pitch modulations (vibrato).

The polarity is important because the LFO phase always restarts on a note trigger. That makes the LFO like an extra pitch envelope which gets triggered by the note.

This parameter controls the waveform:

- <SuP> Sawtooth up
- <Sdo> Sawtooth down
- <Sin> Sine wave rising
- <Si-> Sine wave falling
- <tri> Triangle with rising ramp
- <tr-> Triangle with falling ramp
- <rCt> Rectangular jump from minimum to maximum
- <rC-> Rectangular jump from maximum to to minimum
- <PL1> Pulse width 60% on / 40% off
- <PL2> Pulse width 70% on / 30% off
- <PL3> Pulse width 80% on / 20% off
- <PL4> Pulse width 88% on / 12% off
- <PL5> Pulse width 40% on / 60% off
- <PL6> Pulse width 30% on / 70% off
- <PL7> Pulse width 20% on / 80% off
- <PL8> Pulse width 12% on / 88% off

### **5.1.2. LFO 1 Speed** < 000-252 >

Turn Potentiometer 6 (2\_1 Coupl, **Speed**) to edit the speed of LFO 1. The value is shown in the display. LFO 1 always works on the pitch of the membrane M1.

Speed controls the frequency of LFO modulation. Low value = slow, high value = fast. The phase of the LFO always restarts with a gate trigger.

### **5.1.3. LFO 1 Int(ensity)** < 000-252 >

Turn Potentiometer 7 (Noise, **Int**) to edit the intensity of LFO 1. The value is shown in the display. LFO 1 always works on the pitch of membrane M1.

LFO 1 Intensity controls the amount of modulation. Zero turns the modulation off.

#### **5.1.4. LFO 1 Destination <LM1/no1>**

Whilst the menu LFO is selected, dial the value with the wheel to change the modulation target of LFO 1. Default-wise the LFO works on the pitch of the membrane oscillator M1, but you can also let it modulate metallic noise 1. The result are noise modulations in the rhythm of the LFO which can sound pretty interesting.

#### **5.1.5. LFO 2**

Go to LFO with the up/down buttons. Select page 3 (menu LED lights red) by pressing the page button so that the the display shows LM2. If you are still in preset mode (no menu), you can reach the LFO 2 menu by pressing the page button twice. The same values yield for LFO 2 as described for LFO 1. LFO 2 works on the pitch of the membrane oscillator M2 or on metallic noise generator 2.

#### **5.2. Gate T(ime) (page orange) < 000-255>**

If you are in one of the following menus, please dial in the value with the wheel (alpha dial).  
The gate time, i.e. the impulse length of the trigger pulse for both the membrane circuitries M1 and M2 can be adjusted from 0.1ms to 15ms. This parameter is very influent for the sound of the attack and the decaying tone. The shorter the gate time is, the more high frequencies the spectrum of the attack contains, but the less energy is put into membrane circuitries causing a weaker envelope.

#### **5.2.1. Preset Init (page red) <in?>**

This menu serves to initialize a preset. If you turn the data wheel to the right, all sound parameters are changed to the default value. The display shows "ini" then.

Attention! If you didn't store the sound before, all settings are gone.

### **5.3. Noiz Filt** (page red) < 000-255 >

Behind the noise level control there is a simple 6 dB/octave low pass filter which can make the noise a bit more dull. A strong filtering of noise with a 6 dB/octave filter is also known as "pink noise". The noise loses its sharpness if you lower this value. At <255> the filter is opened and lets all high frequencies pass through with a slight mid-peak at 4kHz. At <000> the noise signal is turned off.

### **5.4. Met Nze 1** (page orange) < off/noi-499 >

Metallic noise 1 is one of the both noise generators. The parameter changes the noise to a metallic noise which consists of periodic asynchronous bit patterns.

With <off> the noise generator is turned off, <noi> yields a static random noise (white noise).

On values above that <2-499> a complex signal formed from digital multitones and bit patterns is produced. Each value represents a unique sound pattern which is not smoothly changing across the range but jumps to various sounds one by one. They remind more of a kaleidoscope rather than a linear scale. But they give you interesting results for any adjustment, so please play the game of trial and error.

Metallic Noise 1 yields a more aperiodic signal which results in more noise-like sounds. This is useful for eg. cowbell-like sounds.

Metallic Noise 2 is more periodic and has an adjustable bit mask.

#### **5.4.1. MetNze 2** (page red) < off-499 >

Metallic noise 2 is another noise generator which offers a more periodic (tone-like) metallic noise algorithm. The basic character of noise 2 can be varied a lot by an adjustable bit mask (which yields only for noise 2).

Both noise generators get mixed by hardware. Therefore the noise level increases significantly if both noise generators are on. The signals interfere and produce new noise patterns then.

### 5.4.2. MetNze 2 Bit Mask (page red blinks) <M01-M16>

This parameter defines the bit mask for noise generator 2. Small values produce very high frequencies in combination with the metallic noise 2 parameter, high values produce longer periodic signals. To hear changes on this parameter please check that metallic noise generator 2 isn't turned off. With low values for bit mask some numbers of metallic noise may produce silence by phase cancellation or may sound the same with every consecutive number so that only the lower numbers are relevant.

### 5.5. CV 1-4

The CV inputs are able to modulate a wide variety of sound parameters. The inputs process voltages from 0..5 volts and can be assigned to a list of modulation targets. Furthermore, the modulation amount can be adjusted for every CV individually and can be negative too.

#### 5.5.1. CV 1-4 Destination (page orange)

Choose the desired CV modulation destination by turning the value dial:

Display	Funktion	Realtime Mod.
1Pi	Membran 1 Pitch	yes
1dP	Membran 1 Dampen	yes
2Pi	Membran 2 Pitch	yes
2dP	Membran 2 Dampen	yes
1Co	Coupling 1_2	yes
2Co	Coupling 2_1	yes
noi	Noise	yes
dEC	Decay	no
noF	Noise Filter	yes
1ME	Metallic Noise 1	yes
2ME	Metallic Noise 2	yes

1Lr	LFO 1 Rate	yes
1Li	LFO 1 Intensity	yes
2Lr	LFO 2 Rate	yes
2Li	LFO 2 Intensity	yes

### 5.5.2. CV 1-4 Amount (page red) <-128 - 127>

This parameter controls the modulation amount of CV1 and its selected target. Please note that this value may be negative too. In this case the CV gets subtracted from the parameter. For instance, if you have chosen M1 pitch as destination it makes the tone the lower the higher the CV is.

The here described adjustments yield for the four programmable inputs CV1-CV4 which are almost all the same. You can also route multiple CVs on one parameter which get added. However, it is not possible to modulate several parameters with one CV because this would be too much for the processing power of the CPU and eventually lead to artifacts.

Because the CVs are sampled by the CPU the maximum frequency resolution is at about 500Hz.

#### **Hint:**

Some CV targets of the instrument can't be modulated in realtime! This is because the hardware spots the value only in the very moment of triggering and can't change it after that because the sound just decays in the circuitry. With those parameters it makes only sense to change the value right before or during the trigger, as does for instance the A-155 of Doepfer. If the tone already sounds (and decays), the CV cannot change anything on *this* parameter.

This yields for:

Decay and its connected two envelopes (noise and membranes).

## 6. Master parameters (menu green)

### 6.1. Midi Ch(annel) < 001 - 016 >

Midi channel on which the Mod.Brane 11 receives and transmits Midi data. Received are: note on/off, note number, program change, controllers. Transmitted are: note on/off, note number, program change.

### 6.2. Split Mode < SM1 / SM2 >

<SM1> The percussion instrument is only played on standard note D1 (GM standard snare drum) with the internal pitch (4.2 Pitch).

<SM2> Note range C1-C2. The note within the octave is added to the pitch of M1 and M2.

<SM3> Note range C2-C3. The note within the octave is added to the pitch of M1 and M2.

<SM4> Note range C3-C4. The note within the octave is added to the pitch of M1 and M2.

<SM5> Note range C1-C6. The percussion instrument is played across the entire keyboard, and the note gets added to the pitch of M1 and M2. Please note that due to the used analog circuitry it is not possible to play the membrane oscillators in exact semitone intervals. All parameters like pitch, dampen and coupling are affecting each other and the ranges are way to large.

You should better see it as a tool to obtain different tunings and sounds on a direct access.

### 6.3. Trig Sens < t01- t99 >

Adjusts the trigger threshold. It is the incoming level from which on the kickdrum gets triggered via TRIG in. If this menu is selected, the LED column works as a VU meter which shows the incoming trigger of the connected pick up (eg. drumpad piezo). A weak lit red LED point roughly shows the trigger threshold from which on the sound gets triggered. If you dial the value with the wheel, the weak red LED point goes up or down.

### **6.3.1. Trig Dynamics**

**< d01- d63 >**

Controls the trigger dynamics. From the trigger threshold on the incoming velocity is multiplied with the dynamics and adapted to the adjusted volume. A low value kills the dynamics and keeps the sound on the same loudness, a high value enables maximum velocity.

### **6.4. Gate Mode**

**<PoS/neg/Str>**

The gate input can process signals from 0..15 volts, yet it triggers at about 1 volts. In position "PoS" = positive (default), the signal must rise from 0 to at least 1.5 volts in order to properly trigger the Mod.Brane 11. After that, the gate signal has to fall again under the threshold down to 0 volts to be able to trigger again. Far most of the available sequencers deliver such gate signals – and it works regardless if the high level of the switching voltage is 5 volts, 8 volts or 15 volts.

In position "neg" = negative, the gate is inverted. That means, it triggers when a transit from high to low occurs and can only retrigger if the gate signal has safely risen above 1 volts again.

Some older sequencers only provide a so-called s-trigger (switch-trigger) – this is useful with position "Str" = switch-trigger. Now the hot wire of the gate cable has to be shorted with ground in order to trigger the unit. It can be a mechanical switch, but in most cases it will be a transistor with open collector which works as a switch. With the usage of a mechanical switch you have to consider that the input is not debounced – you'd have to add a capacitor (roughly 47nF, just a guess) and solder it across the pins of the switch to reduce contact bouncing and multiple triggers.

### **6.5. Volume**

**< 000-255 >**

Adjusts the main volume of the Mod.Brane 11. The maximum velocity of incoming midi notes get only processed to this level. For the best sounding results, you should keep it at <255>.

## **6.6. Bus Vol**

**< 000-255 >**

Controls the bus volume of the Mod.Brane 11 on the Inter-D-Module Bus. This is intended for future applications which make use of the bus and can process a globally storeable mix of several Jomox modules.

## **6.7. Bus Send**

**< 000-255 >**

Controls the effects send level of the Mod.Brane 11 on the Inter-D-Module Bus. This is intended for future applications which make use of the bus and that have access to the effects send bus. We can think of a Jomox effects module (e.g. a filter with reverb) that picks up the various effects send signals from the bus and that creates an effects program for the master mix bus, to which every sound module and every preset can set an individual effects intensity.

## **6.8. Store**

If you want to save a well sounding preset, go on Store. In case you are not in a menu yet (preset mode) you can also press the up arrow button to automatically reach the Store menu. The green LED must blink and the display shows the currently selected preset.

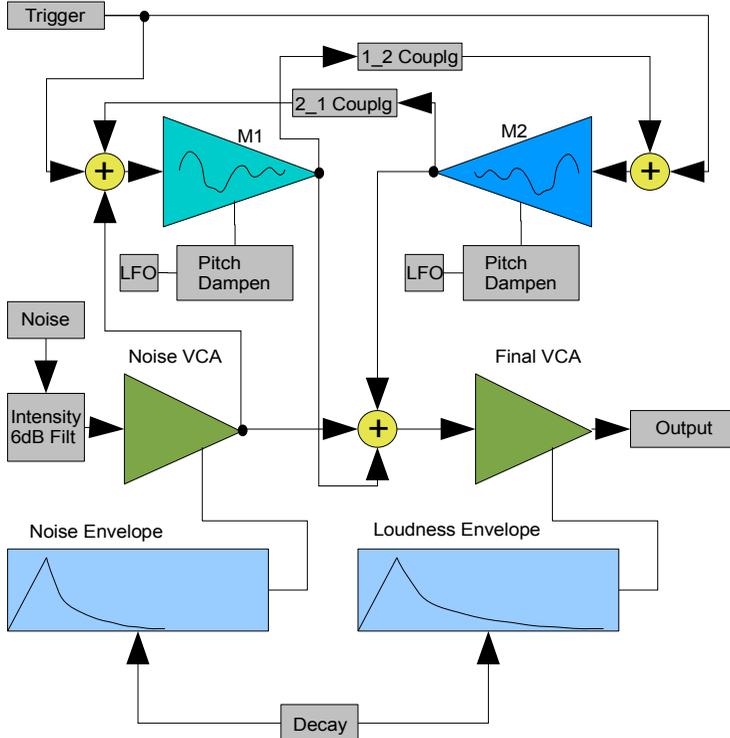
Now you can dial the memory location with the data wheel to store the new preset into. Pressing the Edit/Enter button finally executes the storing and overwrites the existing preset. If you don't move the data wheel, the current preset gets overridden.

This too implements an automatic copy function as the Mod.Brane 11 produces an identical copy of the preset if you store a non-edited preset to another location via Store and dial location.

## **6.9. Technical functional description**

The Mod.Brane 11 is a true analog synthesizer optimized for percussion sounds. The most important parts of the sound are composed by a membrane-like F-OSC network and noise being mixed together.

How does it work?



Pic. 1: Mod.Brane 11 block diagram

The sound production in the Mod.Brane 11 is made up of 2 filter oscillators (M1 and M2) that have the same frequency range of 25Hz - 14kHz.

A filter oscillator (F-OSC) is actually something like a multimode band pass filter which is working close to the resonant frequency.

Because the F-OSC becomes an actual sine oscillator with increasing resonance, we call the deviation of ideal resonance dampen. Then the resonating filter oscillator decays in form of an attenuated vibration if it's exited - similar to a single membrane that is hit.

In the Mod.Brane 11 there are two of such F-OSC. With a strong dampen the F-OSC really becomes a continuously vibrating oscillator. The weaker the

dampen is, the more the F-OSC becomes a filter with sharp q-factor (quality). This can be useful at e.g. snare drums or hihat-ish sounds.

Looking at the drumskins of an acoustic drum, there are 2 membranes positioned that modulate and interact with each other by the coupling through pressure waves of the content air. That produces the typical sound of a drum. By resonance and counteractive interference of waves new frequency bands and overtones create.

Similar to that the parameter Coupling works at the Mod.Brane 11. Both, in the first place independently vibrating F-OSCs, can attenuate or gain the vibration of the partner by means of coupling on either ways (1\_2 and 2\_1). With lightfingered tweaking you get these interesting membrane-like dampened sounds, especially by cross-wise positive/negative coupling. In order to obtain such a phase-wise cross coupling, the parameter 2\_1 Coupling provides negative values too and has a phase flipping circuitry build in.

Furthermore, a slight frequency modulation is provided with every coupling parameter (M1 → M2 and M2 → M1) that makes the cross modulation sound even more natural and interesting.

In order to create snaredrum- or cowbell-like sounds, the Mod.Brane 11 has a noise generator with an own envelope. A part of this signal is fed into the F-OSC network to excite the "membrane" with the noise signal itself. Another part of the noise signal is mixed into the final VCA (Voltage Controlled Amplifier) which produces the overall volume envelope of the resulting instrument. The noise can be either white noise or metallic noise, which is a binary pattern of different metallic sounding frequency bands. In the Mod.Brane 11, there are two independent noise generators which can be mixed together.

The length of noise decay and the decay of the resulting tone are controlled by two different envelopes that are commonly controlled by the parameter Decay. The noise envelope is always shorter than the final VCA envelopes. That lets you work out the precise noise attacks by tweaking the Decay. The F-OSC's mostly have their own decay themselves (changed by Dampen), and they only sometimes need an own (and then longer) loudness envelope.

Two independent LFOs can modulate each of both F-OSCs or not. They always restart with the note trigger and work like an additional pitch envelope.

In Split Modes 2-5 both the F-OSC's pitch can be played over the keyboard via Midi, which again makes it a creative thing to play.

## 7. Mod.Brane 11 Midi Implementation

### 7.1. SysEx Dump

The memory contents of Mod.Brane 11 (that is the presets) can be transferred to a Midi sequencer by SysEx dump. The current single preset including the number can be transmitted or received or the whole memory contents.

#### 7.1.1. Single preset dump

Please select the **Store** menu (Menu LED 8 green blinks) at the Mod.Brane 11. Now press record at the connected midi device (we strongly recommend the newest Jomox SysEx Dumper tool). Then press the **Play** button on the Mod.Brane 11. The current active preset is sent as a midi dump.

#### 7.1.2. All presets dump

Please select the **Bus Send** menu (Menu LED 7 green) at the Mod.Brane 11. Now press record at the connected midi device (we strongly recommend the newest Jomox SysEx Dumper tool). Then press the **Play** button on the Mod.Brane 11. The whole memory contents is sent via SysEx dump. The display reads "bSY" during the dumping and "Fin" if the dump has been finished.

#### 7.1.3. Receive SysEx dump

Please select the **Midi Ch** menu (Menu LED 1 green) at the Mod.Brane 11 and do not change anything. Now start the connected Midi sequencer (we strongly recommend the newest Jomox SysEx Dumper tool because of the required flash memory cycle times). The SysEx data are sent to the Mod.Brane 11 which receives them as presets, displays the preset number and stores the data into the according preset.

## 7.2. Sound Parameter CC

Most of the controllers use one step of the CC resolution for two internal steps. But this is way sufficient enough for these parameters.

Parameter	Controller No.	Range	Internal Resolution
M1 Pitch	108	0..127	256
M1 Dampen	93	0..127	256
M2 Pitch	111	0..127	256
M2 Dampen	97	0..127	256
M1_2 Couplg	101	0..127	256
M2_1 Couplg	103	0..127	256
Noise	109	0..127	256
Decay	110	0..127	256
Noise Filter	112	0..127	256
Metal Noise I	107	0..127	499
Metal Noise II	116	0..127	499
MetalNze II Mask	115	0..15	16
Gate	114	0..127	256
Volume	117	0..127	256
LFO 1 Wave	119	0..15	Sup/Sdo/Sin/Si-/tri-/tri-/rCt/ rC-/PL1-PL8
LFO 1 Intensity	121	0..127	128
LFO 1 Speed	122	0..127	128
LFO 2 Wave	123	0..15	Sup/Sdo/Sin/Si-/tri-/tri-/rCt/ rC-/PL1-PL8
LFO 2 Intensity	124	0..127	128
LFO 2 Speed	125	0..127	128

For the limited controllability by the Jomox devices XBASE 09/888/999 in the snare drum section these controller are supposed to be used:

Parameter	Controller No.	Range	XBase Parameter
M1 Pitch	108	0..127	Snare Tune
Noise	109	0..127	Snare Snappy
Decay	110	0..127	Snare Decay
M2 Pitch	111	0..127	Snare Detune
Noise Filter	112	0..127	Snare Noise Tune

### 7.3. Note Commands

	Split Mode 1	Split Mode 2	Split Mode 3	Split Mode 4	Split Mode 5
Note (Midi Number)	D1(38)	C1(36)- C2(48)	C2(48)- C3(60)	C3(60)- C4(72)	C1(36)- C6(96)

### 7.4. System exclusive data

Since the sound control via Midi is entirely made with CC controllers, SysEx data are only used for sending and receiving presets.

One line of system exclusive commands looks like the following:

\$F0(SysEx Begin), \$31(JoMoX Manufact. code), \$7F(Command Sys Ex Dump), \$5a(Product Code), \$XX(Preset No.),XX(Data0),XX(Data1),..., \$F7(End of SysEx)

32 bytes [bit7...bit0] (0..255) of data per preset are transferred. They are split into two 7-bit midi bytes: MSB [bit7] in Data0 and LSB [bit6...bit0] in Data1. The MSB (most significant bit) is coded in Data0 = 1 or = 0, depending if bit 7 of the actual byte was set or cleared.

The numbers and digits of Sys Ex sequences are shown, as always, in hexadecimal numbers.

And finally...

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We wish you lots of fun on creative usage of our products!

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