GAMECHANGER | AUDIO

MOTOR Synth MKI USER MANUAL

FIRMWARE VERSION v.1.22

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MOTOR - [M]- SYNTH

OVERVIEW



Front Panel

1 MOTOR CONTROLS 2 AMP ENVELOPE **3 ACCELERATION / BRAKE (PITCH ENVELOPE)** 4 AMP ENVELOPE AND ACCELERATION LINK FUNCTIONALITY <u>5 FILTER</u> **6 MODULATION** 7 CROSS MOD **8 DRIFT & DETUNE 9 PERFORMANCE INTERFACE 10 MASTER TEMPO <u>11 ARPEGGIATOR</u> <u>12 SEQUENCER</u> 13 MOTION REC 14 RANDOM GENERATOR 15 INPUT SIGNAL PROCESSING 16 CV AND TRIGGER INPUTS** <u>17 MIDI ASSIGN</u> 18 DELETE **19 PRESETS AND PROJECTS** 20 SETTINGS MENU **21 MIDI IMPLEMENTATION** 22 FIRMWARE UPDATE



Back panel

1 MIDI OUT & IN

5-pin DIN MIDI output and input

2 USB

USB type B for data transfer and MIDI output

3 DC input

Use the included power adapter connected to a power outlet

4 Power button

Turn the unit on and off

5 V1 & V2 SEND RET

Pre-filter send and return for MOTOR VOICE 1 and MOTOR VOICE 2 separately. 3.5mm / 1/8 inch unbalanced TRS (TIP – SEND, RING – RETURN)

6 PHONES

3.5mm / 1/8 inch unbalanced TRS

7 OUT

Main audio output 6.35mm / 1/4 inch unbalanced TS

<u>8 IN</u>

Audio input 6.35mm / 1/4 inch unbalanced TS

9 CV & TRIG IN

3.5mm / 1/8 inch CV and trigger inputs

10 FAN VENT

Variable speed fan for cooling. Do not cover the vent.

11 SD CARD

SD card slot

! Interface Changes in Firmware version 1.22

The firmware version 1.2 introduces extended MOTOR Synth MKI functionality taken from the development of MOTOR Synth MKII. To implement this a few parts of the front panel now perform different functions described below.

SCREEN section

Many screens have additional parameters that don't have dedicated controls on the front panel. These are controlled with **PRESETS** and **PLAY MODE** encoders. These encoders perform their original functions when the *MAIN PLAY SCREEN* is active. In other screens they control additional parameters and will be referred to as **LEFT SCREEN ENCODER (PRESETS)** and **RIGHT SCREEN ENCODER (PLAY MODE).** The functions of these encoders are indicated in the active screen.

The **POLY MODE** button performs its original function when the *MAIN PLAY SCREEN* is active. In other screens it acts as **EXIT** back to the MAIN PLAY SCREEN and will be referred to as **EXIT (POLY MODE)**.

There is detailed information about LEFT SCREEN ENCODER (PRESETS), RIGHT SCREEN ENCODER (PLAY MODE) and EXIT (POLY MODE) functions in all sections.

MODULATION section

The **SYNC TEMPO** button's original function is replaced with additional parameters in the *MOD SCREENS* and thus now performs **MOD SETUP** function and will be referred to as **MOD SETUP (SYNC TEMPO)**

The **ALT + RATE / SUBDIV** combination does not control MODULATION subdivision, instead it is controlled by the **RATE** encoder without holding **ALT**.

There is detailed information about **MOD SETUP (SYNC TEMPO)** and **RATE** functions in the <u>MODULATION</u> section.

TRANSPORT section

A new CLUTCH feature is implemented and controlled with the **TAP** button. The **TAP** button performs its original function while **ALT** is being held pressed. This allows to avoid accidental taps and to implement the CLUTCH function in which case it will be referred to as **CLUTCH (TAP)**.

There is detailed information about **TAP** and **CLUTCH (TAP)** functions in the <u>MASTER TEMPO</u> and <u>CLUTCH</u> sections.

! PRESET FORMAT CHANGE FOR FIRMWARE V.1.22

The firmware version 1.2 was implemented with many major updates to the instrument. As a result all PRESETS created with older firmware versions need to be converted to work properly with the latest firmware. Detailed information is available in the <u>PRESETS and PROJECTS</u> section.

MOTOR CONTROLS

Description

The MOTOR CONTROLS are comparable to the typical oscillator controls in other synthesizers. These are often the foundational parameters for building a patch.

The eight-motor oscillator block is divided into 2 groups / voices - MOTOR VOICE 1 (V1) and MOTOR VOICE 2 (V2). Each MOTOR VOICE consists of 4 motors that can operate in polyphonic, duophonic or monophonic modes. Each voice's 4 motors are controlled with a separate set of controls and parameters.

The first three waveforms, Optical Sine "OPT SINE", Optical Triangle "OPT SAW" and Optical Square "OPT SQ", are produced by an infrared optocoupler (emitter and sensor) that reads three distinct graphical patterns imprinted on reflective optical discs connected to motor shafts. These graphical patterns are located on the discs' bottom side and represent sine, saw, and square waveforms in graphical form.

Note: There are inherent imperfections in this system of producing optical waveforms, resulting in a less than precise readout of the graphical sine, saw and square patterns. The audio output produced by the optical discs does not fully match the sound of these waveforms in typical synthesizers. However, we view these imperfections as desirable sound characteristics because they provide a unique source of audio for further synthesis.

The fourth waveshape, labeled "M" for Motor, is an electromagnetic inductive signal collected by eight magnetic pickups. Each pickup is placed next to the electromotor's rotating coils. This signal generation system is similar to those found in other instruments with inductive pickups, such as the tonewheel organ (which uses electromagnetic induction) and, more distantly, the electric guitar (which uses magnetic induction).





List of parameters

The motors are controlled with one rotary knob **VOLUME** and two rotary switches **WAVE** and **SCALE** for each motor voice.



This list contains an overview of all parameters in this section. For further information refer to the <u>Instructions</u> <u>sub-section</u>.

Parameter	Control	Description	Value Range
Volume [VOL]	VOLUME knob	The volume level of all motors of the given voice.	From 0 to 100
Waveform [WAVE]	WAVE rotary switch	Waveshape output select	Optical Sine "OPT SINE"; Optical Saw "OPT SAW"; Optical Square "OPT SQ"; Motor electromagnetic inductive "M"
[SCALE]	SCALE rotary switch	Scale (octave) select	32' / 16' / 8' / 4' / 2 '
[TUNE]	MASTER TUNE knob	The tuning of both VOICES	From -200c (two semitones down) through 0 to +200c (two semitones up)

[V2 DETUNE]	TUNE VOICE 2 knob	The detune of VOICE 2	From -1200c (one octave down) through 0 to +1200c (one octave up)
[TONE]	TONE knob	Pre-FILTER EQ tilt	From 0 (low boost / high cut) to 100 (low cut / high boost)

Instructions

Setting the VOLUME

Turn the **VOLUME** knob to adjust the output level of each voice - from zero (CCW) to the maximum level (CW).

This is the volume of each motor during the highest point of the <u>AMP ENVELOPE</u>. Unlike the MASTER VOLUME parameter, VOICE VOLUME is saved in user <u>PRESETS</u> and is an integral part of the patch. Whereas, the MASTER VOLUME is intended to be used as a utility control for setup with other gear.

Choosing the waveform - WAVE knob

Turn the **WAVE** rotary switch to select one of the four Waveforms [WAVE] available for each of the MOTOR Synth's motor voices: Optical Sine "OPT SINE", Optical Saw "OPT SAW", Optical Square "OPT SQ" and Motor electromagnetic inductive "M".

Tip 1: The main *PLAY SCREEN* provides an oscilloscope for the final output waveform. To monitor the waveform of a single motor play one note, set the **MASTER VOLUME** to max, turn the **VOLUME** of other voices to 0 and bypass the <u>FILTER</u>.



Optical Saw "OPT SAW" waveform in oscilloscope

Tip 2: As the MOTOR VOICES do not offer waveshaping before the FILTER due to the nature of the instrument it can be a good idea to set both MOTOR VOICES to the same SCALE and explore mixing different WAVESHAPES and AMP & PITCH ENVELOPES.



Setting the SCALE

The **SCALE** switch lets you set the octave range in which the motors will play all notes. Notes can be entered with the MOTOR Synth's performance <u>KEYS, ARPEGIATOR, SEQUENCER</u>, various <u>MIDI</u> controllers, or triggered via the MOTOR Synth's assignable <u>CV inputs</u>.

Using TUNE knobs

The motor rotation speed is digitally precisely controlled so a conventional oscillator tune knob is unnecessary. The **MASTER TUNE** and **TUNE VOICE 2** knobs are added to be used as an effect. The **MASTER TUNE** knob can detune both VOICES by +/- 200c (two semitones) and the **TUNE VOICE 2** knob can detune VOICE 2 by +/-1200c (one octave)

Setting the TONE

The TONE knob controls a pre-<u>FILTER</u> EQ tilt and determines the overall character of the VOICE.

When set to 0 (counter clockwise) it applies low boost / high cut to the whole VOICE. In the center position the EQ is flat and when set to 100 (clockwise) it applies low cut / high boost.

This control is especially useful for adjusting the tone of the VOICE when it bypasses the FILTER

AMP ENVELOPE

Description

The MOTOR Synth features 3 groups of envelopes:

- 1. AMP ENVELOPES
- 2. FILTER ENVELOPES
- 3. MOD ENVELOPES

All of these envelopes are very similar in functionality and share the same settings. The only difference is that each group is modulating a different parameter and each group is accessed differently from the front panel. Therefore, this guide will focus on providing a detailed description of the AMP Envelope, while the FILTER ENVELOPE and MOD ENVELOPE sections will refer back to this section of the manual.



Each motor has its own independent analog AMP ENVELOPE. It is a fundamental tone-shaping tool, as it determines each note's dynamic behavior over time. The AMP ENVELOPES are controlled in voice groups - all four AMP ENVELOPES of one MOTOR VOICE share the same settings, but are triggered independently. The AMP ENVELOPES are fully configurable with several envelope types, per-stage and master curve parameter, reset and velocity parameter.

Note: Due to the semi-polyphonic architecture of the MOTOR Synth, the amplifiers are positioned before the mixer and <u>FILTER</u> in the signal chain. Additionally there is another amplifier after the FILTER to enable dynamic performances when it is self resonating. This additional amplifier is controlled by the root mean square of all 8 AMP ENVELOPES. In other words, even if the FILTER is self resonating it will not be heard while none of the AMP ENVELOPES of the given voice are triggered.

List of parameters

The AMP ENVELOPE is controlled with one **AMP ENV / CURVE** encoder for each MOTOR VOICE and additional parameters in the *AMP ENVELOPE SCREEN* are controlled with the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE)**. Push the **AMP ENV** encoder to access the *AMP ENVELOPE SCREEN* and to toggle between different envelope stages.



VI AMP ENV SCREEN

This list contains an overview of all parameters in this section. For further information refer to the Instructions sub-section.

Parameter	Control	Description	Value Range
Attack [A]	AMP ENV encoder; Push to jump to the parameter; Turn to change the parameter.	The attack stage length in seconds	From 0.000 to 20.000
Decay [D]	AMP ENV encoder; Push to jump to the parameter; Turn to change the parameter.	The decay stage length in seconds	From 0.00 to 20.00
Sustain [S]	AMP ENV encoder; Push to jump to the parameter; Turn to change the parameter.	The sustain stage level	From 0.00 to 1.00
Release [R]	AMP ENV encoder; Push to jump to the parameter; Turn to change the parameter.	The release stage length in seconds	From 0.00 to 20.00

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Parameter	Control	Description	Value Range
Delay [D]	AMP ENV encoder; Push to jump to the parameter; Turn to change the parameter.	The delay stage time in seconds (available only when the DADSR envelope type is selected)	From 0.000 to 5.000
Hold [H]	AMP ENV encoder; Push to jump to the parameter; Turn to change the parameter.	The hold stage time in seconds (available only when the ADSHR envelope type is selected)	From 0.00 to 5.00
Stage curve [C]	ALT + AMP ENV encoder	The curve of the selected envelope stage	From 1.00 (exponential) through 0.00 (linear) to 1.00 (inverse exponential)
Breakpoint [B]	ALT + AMP ENV encoder	The break level - a hidden parameter in the ADSR, DADSR and ADSHR envelope types	From -1.00 to 1.00
TIme [T]	Push ALT + AMP ENV encoder	The time stage length in seconds - a hidden parameter in the ADSR, DADSR and ADSHR envelope types	From 0.00 to - 20.00
Master curve [M CRV]	LEFT SCREEN ENCODER (PRESETS)	The master curve. Functions as an offset to the individual Stage curve [C] parameter	From 1.00 (exponential) through 0.00 (linear) to 1.00 (inverse exponential)
Envelope type [TYPE]	RIGHT SCREEN ENCODER (PLAY MODE)	The envelope type selection	"ADSR" "AD" "AR" "DADSR" "ADSHR" "AD LOOP" "ADS"
Reset [RST]	RIGHT SCREEN ENCODER (PLAY MODE)	The reset setting that determines how the AMP ENVELOPE retrigger acts, when the envelope polyphony slots are filled up	"OFF" - when the envelope is retriggered, the attack stage starts at current envelope level; "GATE" - when the envelope is retriggered it also reset and the attack stage starts from the zero level.

Parameter	Control	Description	Value Range
Velocity [VEL]	RIGHT SCREEN ENCODER (PLAY MODE)	The velocity parameter determines the envelope's amplitude response to midi input note velocity	From -1 (inverted sensitivity) Through - 0 (no sensitivity) To 1 (full sensitivity)

Instructions

Navigating between voices in the AMP ENV SCREEN

The primary way for accessing the *AMP ENV SCREEN* is to press the **AMP ENV** encoder of the MOTOR VOICE. This opens the *AMP ENV SCREEN* for that voice. Press the AMP ENV Encoder in the VOICE 2 section to access the *V2 AMP ENV SCREEN*.



VI AMP ENV SCREEN

An alternative way of jumping between V1 and V2 AMP ENVELOPES in the AMP ENVELOPE SCREEN is to use the </ > arrow buttons in the bottom left corner of the MOTOR Synth. This navigation option is suggested by the small arrow symbols [< >] at the top of the AMP ENV SCREEN.



Setting the basic envelope stage parameters

Press the **AMP ENV** encoder to access the *AMP ENV SCREEN* with the AMP ENVELOPE settings. This screen contains the visual representation of the envelope shape.



Attack [A] stage selected

Push the **AMP ENV** encoder to circularly toggle between the multiple envelope stage parameters and highlight them. For example - pressing the **AMP ENV** encoder a second time, the Decay [D] parameter will be highlighted. Turning the **AMP ENV** encoder will now adjust the value of the Decay [D] parameter.



Decay [D] stage selected

The time based envelope stage parameters Attack [A], Decay [D] and Release [R] are expressed in seconds and range from 0.000 to 20.000 seconds. The Sustain [S] parameter is expressed as a numerical value between 0.00 and 1.00 that represents either a fully closed amp during the sustain stage and a fully open amp respectively.



Setting the Curve [C] and Master curve [M CRV]

The time based envelope stages Attack [A], Decay [D] and Release [R] have a Curve [C] parameter which is expressed in numerical values from -1 (exponential), through 0 (linear) to 1 (inverse exponential).



To change the curve of one of the stages, push the **AMP ENV** encoder until the intended stage is highlighted. Turn the **ALT + AMP ENV** encoder to set the Curve [C] parameter for that stage. You will notice the stage parameters [A, D, R] will be momentarily replaced by the Curve [C] parameter in the *AMP ENV SCREEN*.



Attack [A] stage Curve [C] parameter in the negative range

Additionally, the Master Curve [M CRV] parameter can be used to control the curves of all 3 stages at once. If any of the stages has the Curve [C] set to anything other than 0 (linear) the Master Curve [M CRV] parameter functions as an offset to the existing Curve [C] values.

To set the Master Curve [M CRV] parameter turn the LEFT SCREEN ENCODER (PRESETS)



Master Curve [M CRV] parameter in the positive range

Changing the envelope Type [TYPE]

The AMP ENVELOPE SCREEN offers several types of envelopes. The optimal choice of envelope type depends on the patch and performance tasks at hand. For example, the "ADSR" envelope type might be better suited for a performance using a <u>MIDI</u> keyboard where each note's gate length is determined by the performer. In contrast, the "AD" and "AR" envelope types might work better in fast <u>ARPEGGIATOR</u> performances where the gate length is usually fixed and short.

To change the envelope Type [TYPE] turn the **RIGHT SCREEN ENCODER (PLAY MODE)** and select one of the following.

[TYPE]	Stages	Remark
"ADSR"	Attack [A], Decay [D], Sustain [S], Release [R]	Hidden parameters: Breakpoint [B]; Time [T]. See the next section for further instructions
"AD"	Attack [A], Decay [D]	The gate length will has no effect on the envelope length

"AR"	Attack [A], Release [R]	The sustain level is fixed at the maximum
"DADSR"	Delay [D], Attack [A], Decay [D], Sustain [S], Release [R]	Hidden parameters: Breakpoint [B]; Time [T]
"ADSHR"	Attack [A], Decay [D], Sustain [S], Hold [H], Release [R]	Hidden parameters: Breakpoint [B]; Time [T]
"AD LOOP"	Attack [A], Decay [D]	Loops the envelope while the note gate is high
"ADS"	Attack [A], Decay [D], Sustain [S]	Holds sustain stage indefinitely or until the envelope is retriggered

Setting advanced hidden parameters of the ADSR envelope - Breakpoint [B] and Time [T]

The "ADSR", "DADSR" and "ADSHR" envelope types have two hidden envelope parameters for a more nuanced sound designed compared to a typical ADSR type envelope.

The Breakpoint [B] is a level relative to the Sustain [S] level at which the Decay [D] stage stops. Time [T] is the time during the Sustain [S] stage in which the envelope falls or rises from the Breakpoint [B] level to the Sustain [S] level. If the Breakpoint [B] is lower than Sustain [S] then Time [T] acts as a secondary attack after the Decay [D] stage. However, if the Breakpoint [B] parameter is set higher than the Sustain parameter [S] then Time [T] acts as a secondary decay after the initial Decay [D] stage.

Push the **AMP ENV** encoder until the Sustain [S] stage is highlighted. Turn the **ALT + AMP ENV** encoder to set the Breakpoint [B] level. While holding **ALT** the Sustain [S] parameter is momentarily replaced by the Breakpoint [B] parameter in the *AMP ENV SCREEN*. Negative Breakpoint [B] values will create a second attack, but positive values will create a second decay.



Negative Breakpoint [B]

Push the **ALT + AMP ENV / CURVE** encoder once again to toggle to the Time [T] parameter and turn the **ALT + AMP ENV / CURVE** encoder to set the value. The Time [T] parameter determines the time in which the AMP ENVELOPE will go from the Breakpoint [B] level to Sustain [S] level.



Time [T] ads slope between Breakpoint [B] and Sustain [S]

Setting the ENVELOPE Reset [RST]

The Reset [RST] setting determines how the envelope retrigger behaves. The default Reset [RST] setting is "OFF" in which case the Attack [A] stage of each newly triggered note will begin from its current envelope level when retriggered. In the "GATE" setting each new note gate on event will reset the envelope and the Attack [A] will begin from 0 when retriggered. To change the Reset [RST] setting press the RIGHT SCREEN ENCODER (PLAY MODE) until the setting is highlighted and turn the RIGHT SCREEN ENCODER (PLAY MODE) to change the setting.



Setting the ENVELOPE Velocity [VEL]

The Velocity [VEL] parameter determines the envelope's amplitude response to midi input note velocity. The Velocity [VEL] is expressed in numerical values from 1 (full velocity response), through 0 (no velocity response) to -1 (inverted velocity response). To set the Velocity [VEL] setting press the RIGHT SCREEN ENCODER (PLAY MODE) until the setting is highlighted and turn the RIGHT SCREEN ENCODER (PLAY MODE) to change it.



Velocity [VEL] set to 0.7

Note: While the MOTOR Stynth's built in keypad is not velocity sensitive, the Velocity [VEL] control is an essential parameter when playing with velocity sensitive MIDI keyboards and other external controllers. Furthermore the MOTOR Synth's SEOUENCER and ARPEGIATOR do have a Velocity [VEL] parameter per step which will interact with the ENVELOPE depending on the ENVELOPE's Velocity [VEL] setting.

ACCELERATION / BRAKE (PITCH ENVELOPE)

Description

One of the most exciting sound characteristics of the MOTOR Synth is hearing the motors change their speed of rotation (RPM). Due to physical inertia the motors have an inherent rev up and down rate. In other words, the motors can not change their speed of rotation (and consequently the musical pitch) instantaneously. This is a physical limitation, albeit musically pleasing. As the inherent pitch slew in most cases is very short the MOTOR Synth offers to extend the effect with detailed control over the pitch envelope of each voice called ACCELERATION / BRAKE.

ACCELERATION is a rising or falling pitch when a new note gate is triggered. In terms of a pitch envelope ACCELERATION is the attack stage that can be either positive or negative.

BRAKE is a rising or falling pitch when a note gate is released. In terms of pitch envelope BRAKE is a release stage that can be both positive and negative.

Note: The ACCELERATION and BRAKE parameters are triggered by the note gate, therefore the effect may be masked by conflicting AMP ENVELOPE settings. For example, if the AMP ENVELOPE has an extremely long attack time and instant release time, the ACCELERATION and BRAKE pitch changes will not be heard, as they will take place during the silent stages of the AMP ENVELOPE.

The ACCELERATION / BRAKE section also offers a different mode in which it functions as a classic portamento instead of a pitch envelope. In the portamento type functionality the ACCELERATION is the rate in which pitch rises from a lower to a higher note. The BRAKE is the rate in which pitch falls from a higher note to a lower note.



List of parameters

ACCELERATION / BRAKE is controlled with center indented rotary knob **ACCEL / BRAKE** for each MOTOR VOICE and there are also additional parameters in the *ACCEL SCREEN* controlled with the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE)**.



V2 ACCEL SCREEN

This list contains an overview of all parameters in this section. For further information refer to the Instructions sub-section.

Parameter	Control	Description	Value Range
Acceleration [ACCEL]	ACCEL / BRAKE knob to the left	Sets the rate of ACCELERATION	"OFF" / from 1 to 100
[BRAKE]	ALT + ACCEL / BRAKE knob to the right	Sets the rate of BRAKE	"OFF" / from 1 to 100
[FROM]	LEFT SCREEN ENCODER (PRESETS)	Sets the ACCELERATION starting interval in semitones relative to the target pitch	From - 12 to +12 semitones; Center indent position corresponds to 0 semitones
[TO]	LEFT SCREEN ENCODER (PRESETS)	Sets the BRAKE ending interval in semitones relative to the target pitch	From - 12 to +12 semitones; Center indent position corresponds to 0 semitones
[CURVE]	LEFT SCREEN ENCODER (PRESETS)	Sets the curve of ACCELERATION and BRAKE	From -2 (exponential) through 0 (linear) to +2 (logarithmic)
[MODE]	RIGHT SCREEN ENCODER (PLAY MODE)	Toggles between two modes of ACCELERATION and BRAKE	"TARGET" (functions as pitch envelope) "GLIDE" (functions as portamento)

The graph on the left of the ACCEL SCREEN illustrates the X axis for [ACCEL] and [BRAKE] duration and the Y axis for [FROM] and [TO] intervals.

The graph on the right indicates the real-time ACCELERATION / BRAKE status for each motor of the given voice.

Instructions

Navigating between voices in the ACCEL SCREEN

The primary way for accessing the ACCEL SCREEN is to turn the **ACCEL / BRAKE** knob of the MOTOR VOICE. This opens the ACCEL SCREEN for that VOICE.

An alternative way for navigating between both VOICES in the *ACCEL SCREEN* is to use the **</> arrow** buttons in the bottom left corner of the MOTOR Synth. This navigation option is suggested by the small arrow symbols [< >] at the top of the *ACCEL SCREEN*.



Setting the ACCELERATION

The [FROM] parameter determines the initial interval that each new note of that particular voice will travel from.

Push the **LEFT SCREEN ENCODER (PRESETS)** until [FROM] is selected and turn the encoder to set the value. Negative values produce ascending ACCELERATION intervals, but positive values - descending ACCELERATION intervals. The [FROM] parameter indicates the relative starting interval in semitones. For example, -12 semitones will give one octave rising pitch with each triggered note until the target pitch is reached.



[FROM] set to -12 or one octave below target pitch



Turn the **ACCEL / BRAKE** knob to the left to set the rate at which each new note will reach the target pitch from the [FROM] interval. Set the **ACCEL / BRAKE** knob in the center indented position in order to turn the [ACCEL] effect "OFF".



Acceleration [ACCEL] set to the maximum

	V1 ACCEL >	
CURVE		MODE
-0.0		TARGET
FROM		RECEL (
-12		OFF
TO		REAKE
5		NEE

Acceleration [ACCEL] OFF

Note: If the [ACCEL] rate is set longer than the performed note gate, the target pitch will not be reached in the given time. This will result in out-of-tune target pitch - similar to how a note will not reach full volume if the <u>AMP ENVELOPE</u> attack is longer than the gate. This needs to be taken into consideration when performing with the <u>SEQUENCER</u> or <u>ARPEGGIATOR</u> where in many cases the gate will be set shorter than the available [ACCEL] rates. This can be monitored in the right-hand side graph in the *ACCEL SCREEN*, indicating the motor target. In most cases this effect would be avoided, however it can be used to achieve a unique detune effect.

Setting the BRAKE

Push the **LEFT SCREEN ENCODER (PRESETS)** until [TO] is selected and turn the encoder to set the value. Positive values produce ascending BRAKE intervals, but negative values - descending BRAKE intervals. The [TO] parameter indicates the relative starting interval in semitones. For example, +5 semitones will produce a perfect fourth rise from the target pitch with each released gate.

Turn the **ALT + ACCEL/BRAKE** knob to the right to set the rate with which each released note will fall or rise to the [TO] interval. Set the **ALT + ACCEL/BRAKE** knob in the center indented position in order to turn the [BRAKE] effect "OFF".



[TO] set to +5 semitones and [BRAKE] rate set to 60

Setting the ACCELERATION / BRAKE CURVE

Push the **LEFT SCREEN ENCODER (PRESETS)** until [CURVE] is selected and turn the encoder to adjust the [CURVE] for both ACCELERATION and BRAKE parameters. Negative values will produce an exponential curve, positive values will produce an inverse exponential curve.



[CURVE] set to a negative value producing exponential curve

GLIDE MODE

The default ACCELERATION / BRAKE [MODE] is "TARGET" which is described previously in this section. An alternative [MODE] is "GLIDE", which functions as a classic portamento between pitch changes. In this mode [FROM] and [TO] parameters do not alter the effect, as these are determined by the intervals between notes performed.

Turn the **RIGHT SCREEN ENCODER (PLAY MODE)** to toggle between "TARGET" and "GLIDE" modes.





The MOTOR Synth offers detailed control over the portamento effect. The [ACCEL] parameter sets the portamento rate for when the pitch is rising and the [BRAKE] parameter for when the pitch is falling.

Turn the **ACCEL / BRAKE** knob left to set the rate at which a motor will rev up to a higher RPM when a new note is triggered.

Turn the **ALT + ACCEL / BRAKE** knob right to set the rate at which a motor will rev down to a lower RPM when a new note is triggered.

r,	
l I	Note: The ACCEL / BRAKE functionality is polyphonic - each motor has it own separate
	ACCELERATION and BRAKE. If the performance consists of sparse monophonic parts the glide will not
	be always heard as each new note will likely be assigned to a new motor. If glide is required for
	monophonic performances, set the voice's <u>POLYPHONY SETTINGS</u> to "DUO" or "UNI" depending on the
	performance.
l L	ا لر

AMP ENVELOPE AND ACCELERATION LINK FUNCTIONALITY

Description

Each of the MOTOR Synth's VOICES have independent control over <u>AMP ENVELOPE</u> and <u>ACCELERATION /</u> <u>BRAKE</u> which allows you to use each VOICE as a distinct separate part. However, to use both VOICES more like layers, adjusting these parameters individually can be inconvenient.

The LINK functionality solves this problem by allowing adjustments of AMP ENVELOPE and ACCELERATION / BRAKE parameters of both VOICES together with one set of controls. For example, instead of setting the AMP ENVELOPE for V1 and then for V2, LINK allows users to choose which of the voices acts as master with the other following the master controls.

List of parameters

The LINK functionality is accessible by pushing the **ENV SYNC** button for AMP ENVELOPES and **ACCEL SYNC** button for ACCELERATION / BRAKE. The related parameters are controlled with the **LEFT SCREEN ENCODER** (**PRESETS**) & **RIGHT SCREEN ENCODER (PLAY MODE)**.



This list contains an overview of all parameters in this section. For further information refer to the Instructions sub-section.

Parameter	Control	Description	Value Range
Link Master [LINK MST]	LEFT SCREEN ENCODER (PRESETS)	The master VOICE selection for LINK functionality. The master voice controls will affect the other VOICE	"V1" MOTOR VOICE 1 "V2" MOTOR VOICE 2
Unlink Type [UNLINK]	RIGHT SCREEN ENCODER (PLAY MODE)	Behavior when the LINK is disabled (Unlinked).	"NO CHANGE" - Both VOICES remain with the current parameter values, but are now individually controllable; "TO SET VALS"' - The slave VOICE returns to the original values and is now individually controllable.

Both **LINK** buttons open a separate LINK screen: *ENV LINK/UNLINK SCREEN* and *ACCEL LINK/UNLINK SCREEN*. The graph on the left side displays the state of the master VOICE and the graph on the right side shows the master/slave relationships.

ENV LINK/UNLINK		RCCEL LINK/UNLINK	
ELINK MST	UNLINK	OLINK MST	UNLINK
	NO CHANGE	45	TO SET VALS
┝──╮			
LINK	UNLINK	LINK	UNLINK

AMP ENVELOPE and ACCELERATION / BRAKE LINK

Instructions

All instructions and screenshots below use the AMP ENVELOPE section as an example. They also apply to ACCELERATION / BRAKE.



LINK

Push the **ENV SYNC** button to enter the *ENV LINK/UNLINK SCREEN*. Turn the **LEFT SCREEN ENCODER (PRESETS)** to choose the Master Voice [LINK MST] "V1" or "V2".



ENV LINK/UNLINK SCREEN, V2 selected as Master Voice [LINK MST]

Push the **LEFT SCREEN ENCODER (PRESETS)** to confirm the LINK. This step will link both envelopes to the chosen master voice and open the *AMP ENV SCREEN* of the master voice. The Master "MST" voice controls will also control the Slave "SLV" parameters. The master voice is indicated by the Master "MST" label in the *AMP ENV SCREEN*, whereas the slave voice is indicated by the Slave "SLV" labels.



V2 as Master "MST" voice and V1 as Slave "SLV" voice

The Slave "SLV" voice's original parameter values (before LINKING) are stored in the instrument's memory and are indicated by the dotted lines. Those parameters that do not match with the Master's "MST" are flashing. This allows to either <u>UNLINK</u> the envelopes and return to the previously set parameters or to switch the Master "MST" voice assignment.

To change the Master "MST" voice repeat the LINK process: Push the **ENV SYNC** button to enter the *ENV LINK/UNLINK SCREEN*. Turn the **LEFT SCREEN ENCODER (PRESETS)** to choose the master voice "V1" or "V2". Push the **LEFT SCREEN ENCODER (PRESETS)** to confirm the LINK.

Tip: The AMP ENVELOPE of each voice can be used as a sort of an envelope shape preset, and the Master "MST" voice selection can be used to choose one of the 2 presets. For example, LINK both envelopes to the V1 as Master Voice "MST". While linked, navigate to the V2 AMP ENV SCREEN. Change the V2 AMP ENVELOPE parameters. The parameter changes will not affect the sound, because it is in Slave "SLV" state, however, the dotted line envelope shape and flashing parameter readouts will match with the new settings. Now LINK both envelopes with V2 as Master "MST". Now all envelopes will take over the V2 parameter values.



UNLINK

To exit the LINKED state and to regain individual control over both AMP ENVELOPES push the **ENV SYNC** button to enter the *ENV LINK/UNLINK SCREEN*. Turn the **RIGHT SCREEN ENCODER (PLAY MODE)** to toggle between two UNLINK modes: "NO CHANGE" or "TO SET VALS".

UNLINKING with **"**TO SET VALS" will snap the Slave "SLV" AMP ENVELOPE to its own settings indicated by the dotted line envelope shape and flashing parameter readouts. In most cases this will produce an immediate change in sound.

UNLINKING with "NO CHANGE" will copy the Master's "MST" parameter values over to the Slave "SLV" voice before UNLINKING. The slave "SLV" voice will lose its individual ENVELOPE parameter values. However, this allows for smooth transitions with no change in sound, as individual control is regained.

FILTER

Description

The MOTOR Synth features an analog resonant multi-mode FILTER. The filter modes are 12 dB low pass, 24 dB low pass, 12 dB band pass and 12 dB high pass. There is a powerful DRIVE circuit before the filter as well as an independent FILTER ENVELOPE with variable ENVELOPE AMOUNT. The RESONANCE control can push the filter into self-oscillation and can be used as an oscillator.

Note: The MOTOR Synth signal path before the FILTER is polyphonic where each motor has a dedicated amplifier controlled by a individual envelope. The FILTER section is paraphonic, where all 8 motors are mixed together and passed through one FILTER.

List of parameters

The FILTER is controlled with **CUTOFF FREQ**, **RESONANCE**, **DRIVE**, **FILTER ENV AMOUNT** as well as **FILTER ENV** encoder and **TYPE** switch.

The **VI** and V2 buttons determine whether the given voice is sent through the FILTER or bypasses it.

To enter the *FILTER SCREEN* press **ALT + V1 / V2 / KEYTRACK** button. Additional parameters in the *FILTER SCREEN* are controlled with the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE).**

			HETS ROOT NOT POLY MODE
1 UNICOME	AT WAYE WAYE SCALE SCALE SCALE SCALE SCALE SCALE SCALE		TYPE CUTORF REC CUTORF FREQ DRIVE RESONANCE
LATCH BROM PLAY / STOP REC			

FILTE	R	
UTYPE Cutoff Res Env RMT Drive	LP12 6776 59 0 0	0FF 4

FILTER SCREEN

This list contains an overview of all parameters in this section. For further information refer to the Instructions sub-section. This list does not include FILTER ENVELOPE parameters, because the FILTER ENVELOPE functions the same and offers control over the same parameters as <u>AMP ENVELOPES</u>.

Parameter	Control	Description	Value Range
Filer type [TYPE]	TYPE knob	Filter type selection	"LP12" 12dB Low Pass "LP24" 24sB Low Pass "BP12" 12dB Band Pass "HP12" 12 dB High Pass
[CUTOFF]	CUTOFF FREQ knob for coarse tuning & LEFT SCREEN ENCODER (PRESETS) for fine tuning	The filter cutoff point in cents (default) or hertz depending on the settings in the <u>SETTINGS</u> <u>MENU</u>	From 20 to 21096 Hz or From 0 to 12000 cents relative to 20 Hz
Resonance [RES]	RESONANCE knob	Resonance amount	From 0 to 100 Self-oscillation starts at ~87
[DRIVE]	DRIVE knob	Drive circuit gain before the FILTER	From 0 to 100
Envelope Amount [ENV AMT]	FILTER ENV AMOUNT knob	The amount of FILTER ENVELOPE modulation on [CUTOFF]	From -100 (Full amount, inverted), through 0, to 100 (full amount)
Key Tracking [KYTR]	KEYTRACK button	[CUTOFF] key tracking status	"OFF" "ON"
Key Tracking Amount [AMT]	RIGHT SCREEN ENCODER (PLAY MODE)	The key tracking amount	From -100 (Inverted tracking) through 0 to 100 (precise tracking)
Key Tracking Glide [GLIDE]	RIGHT SCREEN ENCODER (PLAY MODE)	Key tracking glide (slew / portamento)	From 0 to 5

Instructions

Engaging the FILTER SCREEN

To enter the *FILTER SCREEN* hold **ALT** and press either **V1, V2** or **KEYTRACK** button.

Each VOICE can either pass through the FILTER or bypass it. To pass a VOICE through the FILTER press the **V1** and **V2** buttons accordingly. When the button is lit red, the VOICE goes through a pre-FILTER mixer. If the button is not lit, the VOICE is mixed post-FILTER. This is also indicated by a momentary pop-up when the bypass status is changed.

(ON)	¥1	FILT	0N 🗸
UTYPE Ocutoff Ores Uenv Amt Udrive	LP12 6756 59 0		- OFF 4 0.00
	V1 FII ⁻		

Setting the basic FILTER parameters [TYPE], [CUTOFF], Resonance [RES] and [DRIVE]

Turn the **TYPE** rotary switch to choose one of four Filter Types [TYPE] - 12 dB Low Pass, 24 dB Low Pass, 12 dB Band Pass and 12dB High Pass. All four filter types are resonant and can self-oscillate.

Turn the **CUTOFF FREQ** knob to set the Filter Cutoff Frequency [CUTOFF]. This knob functions as a coarse tune control and is fully sufficient in most cases. If a fine-tune control is required to set a very precise cutoff frequency turn the **LEFT SCREEN ENCODER (PRESETS)** while in the *FILTER SCREEN*.

Note: The FILTER Cutoff Frequency [CUTOFF] ranges from 20 to 21096 Hz. However, the default [CUTOFF] measurement unit is cents where 0 cents correspond to a frequency of 20 Hz or roughly E0 note. The measurement unit (hertz or cents) can be changed in the <u>SETTINGS MENU</u>. Using cents as a measurement unit is useful when utilizing the Keytrackng [KYTR]. Cents indicate the [CUTOFF] offset from the note pitch. For example, if Keytrack Amount [AMT] is set to 100 then setting the [CUTOFF] to 1200c will correspond to one octave above note pitch.





Turn the **RESONANCE** knob to set the Filter Resonance [RES] amount. At higher settings the FILTER self-oscillates which is indicated by an exclamation mark sign.



Self oscillating FILTER

Turn the **DRIVE** knob to set the [DRIVE] level. This determines the FILTER input signal level. Distorting the signal adds more harmonic content before filtering. However, when both VOICES pass through the FILTER definition between both VOICES can be lost with higher [DRIVE] values.

Tip: Other instruments that utilize electromagnetic induction pickups, especially the electric guitar, are known to be used with distortion and filtering afterwards. In the case of the electric guitar, pedals and amplifiers introduce distortion that is filtered by guitar speakers. Similarly the harmonically rich motor electromagnetic induction sound responds well to distortion and filtering.

FILTE	R	
UTYPE Cutoff Res UENV AMT URIVE	8P12 9315 21 0 82	 0FF ₩ 0.00 4 0.00



Setting the FILTER ENVELOPE and Envelope Amount [ENV AMT]

The FILTERS has a dedicated FILTER ENVELOPE which modulates the [CUTOFF] parameter. The ENVELOPE shape can be adjusted with the **FILTER ENV** encoder. The ENVELOPE functions the same as the AMP ENVELOPE. Please refer to the <u>AMP ENVELOPE</u> section for details.





Turn the **FILTER ENV AMOUNT** knob to set the Envelope Amount [ENV AMT] for the [CUTOFF] parameter. As the ENVELOPE AMOUNT Knob is a center indent potentiometer, it offers gradual positive and negative modulation amounts. In the center indent position the [ENV AMT] is zero.



[ENV AMT] set to 60

Using Key Tracking [KYTR]

The Key Tracking [KYTR] and related parameters determine how the FILTER tracks pitch. The FILTER will track the pitch of the last note played.

Push the **KEYTRACK** button to toggle the [KYTR] between the "OFF" and "ON" states.

Push the **RIGHT SCREEN ENCODER (PLAY MODE)** to highlight the Key Tracking Amount [AMT] parameter and turn the encoder to change the parameter's value. The default value is 0 which produces no key tracking. The maximum value 100 provides precise key tracking. The minimum value -100 produces inverted key tracking.

Key Tracking [KYTR] modulates the [CUTOFF] parameter. In order for the [CUTOFF] frequency to match the note frequency, set the CUTOFF knob to the minimum position value 0c or 20 Hz and then set the Key Tracking Amount [AMT] to 100.

FILTE	R		
			A
O TYPE	LP24	PA -	गमा
OCUTOFF	0		
O RES	100	RALE	02.0
		HP11	

Key Tracking [KYTR] ON and Key Tracking mount [AMT] set to 100

Tip: Even though setting [KYTR] to the "OFF" position produces the same effect as setting the amount [AMT] to 0, the [KYTR] parameter can be quickly and easily toggled during a performance, while the [AMT] parameter remains set to a specific value. This can be very useful when performing with a self-oscillating FILTER that is being toggled between Key Tracking and non-Key Tracking modes.



Push and then turn the **RIGHT SCREEN ENCODER (PLAY MODE)** to set the Key Tracking Glide [GLIDE] - an innovative parameter which adds slew (portamento) to the FILTER Key Tracking function.

FILTER			
UTYPE	LP24 0	<u>E</u> A	
ONE	100	KYTR	UN C
WENU RMT	1	<u>RMT</u>	100
ORIVE	100	GLIDE	2.00 C

Tip: Because the FILTER is paraphonic, long Key Tracking Glide [GLIDE] values can be very useful when performing long polyphonic pads or ambiences. Without the [GLIDE], whenever a new note is layered, the FILTER [CUTOFF] will suddenly change, thus causing the already playing notes to change their sound. Longer Key Tracking Glide [GLIDE] values help smooth out this unwanted effect.
MODULATION

Description

The MODULATION section consists of 3 independent MODULATORS.

- MODULATOR 1 modulates the frequency and/or amplitude of VOICE 1
- MODULATOR 2 modulates the cutoff frequency and/or resonance of FILTER
- MODULATOR 3 modulates the frequency and/or amplitude of VOICE 2

Each destination has independent depth and polarity. The depth of each modulator is also controlled by an individual MOD ENVELOPE. Each modulator can also have its own independent clock source that can be further multiplied or divided.

List of parameters

All of the parameters of each MODULATOR are organized in two screens - *MOD SCREEN* and *MOD SHAPE SCREEN*. This section is organized in two parts accordingly.

MODULATOR parameters

The MODULATORS are controlled with the **PITCH/TREM** and **FREQ/RES** switches and **MOD** depth knobs. Other parameters are controlled with shared **RATE, MOD ENV** encoders and a rotary **SHAPE** switch. Furthermore, additional parameters are controlled with the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE)** in the *MOD SCREEN*. To access the *MOD SCREEN* push the **MOD SETUP (SYNC TEMPO)** button.





MOD SCREEN

This list contains an overview of all parameters in this section. For further information refer to the Instructions sub-section. This list does not include MOD ENVELOPE parameters, because the MOD ENVELOPES function the same and share the same parameters with <u>AMP ENVELOPES</u>.

Parameter	Control	Description	Value Range
[V1 / V2 PITCH]	Switch set to PITCH + VOICE 1 / 2 knob	The modulation depth for VOICE 1/2 pitch	From -100 (full depth inverted) through 0 to 100 (full depth)
[V1 / V2 AMP]	Switch set to TREM + VOICE 1/2 knob	The modulation depth for VOICE 1/2 amplitude	From -100 (full depth inverted) through 0 to 100 (full depth)
[CUTOFF]	Switch set to FREQ + FILTER knob	The modulation depth for FILTER cutoff	From -100 (full depth inverted) through 0 to 100 (full depth)
[RES]	Switch set to RES + FILTER knob	The modulation depth for FILTER resonance	From -100 (full depth inverted) through 0 to 100 (full depth)
[MOD SHAPE]	SHAPE rotary switch	Modulation shape	"STEP" Stepped shape; "TRI" Triangle; "SQ" Squarewave; "SAW UP" Rising Sawtooth; "SAW DWN" Falling Sawtooth

Clock Source [CLK SRC]	LEFT SCREEN ENCODER (PRESETS)	The clock source for [RATE]	"INT" Internal arbitrary frequency of the given MODULATOR; "MOD 1/2/3" The [RATE] of another MODULATOR; "BPM" Master tempo; "NOTE" the frequency of the last note played
Phase Reset [PHASE RST]	LEFT SCREEN ENCODER (PRESETS)	Toggle of MODULATOR phase reset on each new note played	"OFF" No reset; "ON" MODULATOR phase is reset with each new note played.
Subdivision [SUBDIV]	RATE encoder	Subdivision or multiplication of the Clock Source [CLK SRC] frequency or BPM	Divisions from 1/2 to 1/32 Multiplications from 1/1 to 8/1
[RATE]	RATE encoder	Frequency of "INT" [CLK SRC] in hertz	From 0 Hz to 32760.1 Hz

SHAPE parameters

Each MODULATOR has its main [MOD SHAPE] parameter controlled by the **SHAPE** rotary switch. However, the shape can be further sculpted with a set of SHAPE parameters in the *MOD SHAPE SCREEN* (listed below) controlled with the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE)**. To access the *MOD SHAPE SCREEN*, first enter the *MOD SCREEN* by pushing the **MOD SETUP (SYNC TEMPO)** button and then press the **RIGHT SCREEN ENCODER (PLAY MODE)** labeled "SHAPE CTRL" or **ALT + MOD ENV / SHAPE CTRL**



This list contains an overview of all parameters in this section. For further information refer to the Instructions sub-section. The availability of several parameters is dependent on the main [SHAPE] selection with the **SHAPE** rotary switch. This is indicated in the Description column.

Parameter	Control	Description Value Range	
[CURVE]	LEFT SCREEN ENCODER (PRESETS)	The curve of all sloped [MOD SHAPES]. Not available for ''STEP" and "SQ" shapes.	From -1 (exponential) through 0 (linear) to 1 (inverse exponential)
Pulse Width [PW]	LEFT SCREEN ENCODER (PRESETS)	The pulse width of the "SQ" Squarewave shape. Not available for other shapes.	From -1 (0% duty cycle) through 0 (50% duty cycle) to 1 (100% duty cycle)
X-axis Offset [X OFFS]	LEFT SCREEN ENCODER (PRESETS)	Waveform offset on the X-axis, or in other words waveform phase offset.	From -0.5 (-90°) through 0 (0°) to 0.5 (90°)
Y-axis Offset [Y OFFS]	LEFT SCREEN ENCODER (PRESETS)	Waveform offset on the Y-axis or in other words waveform output 0.5 offset.	
[SLOPE]	LEFT SCREEN ENCODER (PRESETS)	Slew amount From 0 to 100	
[SCALE]	PITCH/TREM and FREQ/RES switch + RIGHT SCREEN ENCODER (PLAY MODE)	+ The maximum possible modulation depth individually for each of the MODULATOR destinations	
Stepped Type [TYPE]	RIGHT SCREEN ENCODER (PLAY MODE)	Stepped shape "STEP" type	"UP" rising stepped waveform; "DOWN" falling stepped waveform; "NOISE"; "PATTERN" predefined stepped pattern; "RND" random stepped waveform
[STEPS]	RIGHT SCREEN ENCODER (PLAY MODE)	The number of steps within one waveform cycle. Not available on "NOISE"	
Pattern Number [PAT NO]	RIGHT SCREEN ENCODER (PLAY MODE)	The predefined pattern number. Only available for "PATTERN" Sentender of the pattern number. No 15 is a randomly generated and repeated pattern.	
Noise Grain [GRAIN]	RIGHT SCREEN ENCODER (PLAY MODE)	Sample and hold of "NOISE". From 0 to 1 Only available for "NOISE"	

Instructions

Navigating the MODULATION section and screens

Push the **MOD SETUP (SYNC TEMPO)** button to toggle between the two main MODULATION screens: the *MOD SCREEN* and *MOD SETUP SCREEN*.

The *MOD SCREEN* provides access to all MODULATOR parameters of a single MODULATOR. Navigate between MODULATORS by using the **</> arrow** buttons as indicated by the "<>" symbols at the top of the *MOD SCREEN*. Alternatively turn the **MOD** knob of the desired MODULATOR and the respective *MOD SCREEN* will be displayed.



To switch between each MODULATOR's two Mod Destinations use the **PITCH/TREM** and **FREQ/RES** switches above the respective **MOD** knob. The selected Destination is indicated by the knob symbol in the *MOD SCREEN*. In the picture above it is set to FILTER cutoff frequency].

The *MOD SETUP SCREEN* provides an overview of all three MODULATORS and quick access to their Clock Source [CLK SRC] and Subdivision [SUBDIV] parameters. To jump between the *MOD SCREEN* and *MOD SETUP SCREEN* press the **MOD SETUP (SYNC TEMPO)** button.

Push the < >arrow buttons or turn the LEFT SCREEN ENCODER (PRESETS) to toggle between MODULATORS. Push the **RIGHT SCREEN ENCODER (PLAY MODE)** to toggle between each Modulator's Clock Source [CLK SRC] and turn the **RIGHT SCREEN ENCODER (PLAY MODE)** to change the [CLK SRC] for the highlighted MODULATOR.



MOD SETUP SCREEN



MODULATOR setup

Push the **MOD SETUP (SYNC TEMPO)** button to enter the *MOD SCREEN*. This screen is used to set up all parameters of each modulator. All parameters are shared between both destinations except for [DEPTH].



Use the **PITCH/TREM** and **FREQ/RES** switches to toggle between the two destinations and turn the **VOICE 1** / **VOICE 2 / FILTER** knobs to set the independent [DEPTH] of each destination. The [DEPTH] parameter for each destination can be either positive or negative. This parameter is modulated by the <u>MOD ENVELOPE</u>.

Use the **SHAPE** rotary switch to choose the basic [MOD SHAPE] for the currently active MODULATOR. The possible options are ''STEP" Stepped shape, "TRI" Triangle, "SQ" Squarewave, "SAW UP" Rising Sawtooth, "SAW DWN" Falling Sawtooth. Each of these shapes can be further modified in the <u>MOD SHAPE SCREEN</u>.



Turn the **LEFT SCREEN ENCODER (PRESETS)** to select the Clock Source [CLK SRC]. The [CLK SRC] is used to determine the frequency of the MODULATOR which can be further divided or multiplied with the Subdivision [SUBDIV] parameter. The table below lists the possible [CLK SRC] options and typical applications.

[CLK SRC]	Explanation	Application
"INT"	Internal arbitrary frequency of the given MODULATOR	The internal arbitrary frequency is useful when imitating classic low frequency oscillators with a simple frequency control. This clock source is fully independent of the master tempo and the performance.

"MOD 1/2/3"	The [RATE] of another MODULATOR	Using the frequency of another MODULATOR allows the same frequency or division or multiplication of it. Changing the frequency of the source MODULATOR will immediately affect the target MODULATOR as well. This allows the creation of rhythmically related MODULATORS and simultaneous control over several MODULATORS by changing the frequency of a single MODULATOR.
"BPM"	Master tempo	Using the Master tempo as clock source allows the creation of MODULATORS that are rhythmically related to the Master tempo. The typical application is for rhythmic performances with the ARPEGIATOR and SEQUENCER. However, if the synthesizer is freely performed "off the grid" the Master tempo still allows control of the MODULATORS that use it as "CLK SRC". This means that TAP TEMPO can be used to quickly change the frequency of the MODULATORS.
"NOTE"	The frequency of the last note played	Using the frequency of the last note played allows to create MODULATORS rhythmically related to the pitch of the performance. A large division of the Note's frequency using the [SUBDIV] parameter will provide sub-audio frequency for the MODULATOR. However a small division of the note's frequency or the exact frequency can be used for audio-rate modulation.

Push and turn the **RATE** to set the [SUBDIV] parameter. The [SUBDIV] parameter consists of a numerator and a denominator, so both multiplications and divisions are possible.

Push the **LEFT SCREEN ENCODER (PRESETS)** to select the Phase Reset [PHASE RST] parameter and turn the encoder to toggle between the "OFF" and "ON" states. If set to "OFF" the phase of the [SHAPE] is not related to the performance. In the "ON" positional the phase of the [SHAPE] will be reset with each new note played. This is useful when exactly the same modulation effect is required for each new note played. The phase reset point can be changed in the <u>MOD SHAPE SCREEN</u> with the X-axis Offset [X OFFS] parameter.

Note: The Phase Reset [PHASE RST] function is also active when the [CLK SRC] is set to "BPM" in which case only the frequency of the MODULATOR is determined by the Master Tempo but not the phase.

MOD SHAPE adjustments

The [SHAPE] parameter controlled with the **SHAPE** knob determines the basic MODULATOR waveform. It can be further sculpted in the dedicated *MOD SHAPE SCREEN*.



Push the **MOD SETUP (SYNC TEMPO)** button to enter the *MOD SCREEN,* navigate to the desired MODULATOR and then push the **RIGHT SCREEN ENCODER (PLAY MODE)** or **ALT + MOD ENV / SHAPE CTRL** to enter the *MOD SHAPE SCREEN*.



There are separate shape parameters available for the different shape types [SHAPE]. All parameters are shared between both destinations of a single MODULATOR except for the Output Scale [SCALE] which is independent for each destination. All parameters are controlled with the **LEFT SCREEN ENCODER** (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE). Push the SCREEN ENCODERS to toggle between different SHAPE parameters and turn the SCREEN ENCODERS to change the parameter values.

[CURVE]

The [CURVE] parameter is available for all sloped [SHAPES]. By default the slopes are linear and are adjustable to be exponential or inverse exponential. Changing the [CURVE] of the modulation drastically alters the sound without adjusting the [RATE] and [DEPTH] of the modulation. In the examples below the Triangle "TRI" shape is shown as an exponential [CURVE] and an inverse exponential [CURVE] respectively, thus showcasing the power of the [CURVE] parameter.





Pulse Width [PW]

The Pulse Width [PW] parameter is available only for the Squarewave "SQ" [SHAPE]. The width is adjustable from a 0% to a 100% duty cycle. A 100% Pulse Width [PW] allows to create a flat offset for the destination parameter, with the [DEPTH] parameter functioning as an offset value in this case.



X-axis Offset [X OFFS]

The X-axis Offset [X OFFS] can also be described as a waveform phase offset. The effect of this parameter is heard when the MODULATORS are synchronized to some other event. For example, when [PHASE RST] is set to "ON" the [X OFFS] determines the starting point of the waveform with each new note played.



Y-axis Offset [Y OFFS]

The Y-axis Offset [Y OFFS] can also be described as a waveform output offset. The polarity of modulation greatly alters the outcoming sound. For example, if the shape is fully in the positive region, then with positive [DEPTH] values the destination parameter will be modulated upwards from the parameter's set value. If the [Y OFFS] places the waveform in both positive and negative range crossing the 0, then the destination waveform will be modulated from the set value.



[SLOPE]

[SLOPE] is the slew amount applied to the [SHAPE]. This allows smoothing out random and stepped waveforms such as in the example below, as well as squarewave and other waveforms with hard edges.



[SCALE]

The [SCALE] parameter is individual for each MOD DESTINATION. Use the **PITCH/TREM** and **FREQ/RES** switches to toggle between them. This parameter allows to dial in the maximum possible MODULATION output with the depth knob in both the maximum positive and negative positions. This parameter is useful when a full modulation depth of the destination parameter is undesirable. In this case the [SCALE] parameter allows to fine-tune the range of the depth knob so that the full movement of the knob provides useful modulation depths.



Stepped shape "STEP" parameters: Stepped Type [TYPE], [STEPS], Pattern Number [PAT NO] and Noise Grain [GRAIN]

These four parameters are only available for the "STEP" [SHAPE].



Stepped Type [TYPE] parameter toggles between several distinct stepped voltage types: "UP" rising stepped waveform, "DOWN" falling stepped waveform, "NOISE", "PATTERN" predefined stepped pattern, "RND" random stepped waveform.

The [STEPS] parameter determines the number of steps within one period of the waveform. From 2 to 8 are possible.

The [PAT NO] parameter scrolls through several predefined patterns when [TYPE] is set to "PATTERN". Slots 0-14 are predefined patterns but slot 15 is a randomly generated and repeated pattern. The slot 15 is randomly generated each time it is selected.

Noise Grain [GRAIN] is the noise sample rate reduction parameter.

MOD ENVELOPE

Each of the three MODULATORS has a dedicated MOD ENVELOPE which modulates the [DEPTH] parameter and is controlled with the **MOD ENV** encoder. It functions the same as the AMP ENVELOPE. Please refer to the <u>AMP ENVELOPE</u> section for details.



CROSS MOD

Description

The MOTOR Synth features the CROSS MODULATION effect where the MOTOR VOICE 2 cross modulates the MOTOR VOICE 1.



CROSS MOD is an amplitude (RING) or frequency (FM) cross modulation between both MOTOR VOICES. The effect produces aggressive and raspy sounds which provide rich harmonic content for further filtering. As the effect is based on VOICE cross modulation, it is fully dependent on the pitch performance of each VOICE. The CROSS MOD effect does not use the actual VOICE output as the modulator signal, but rather a signal created based on the current [WAVE] settings and pitch of the most recently played note. This can be used to alter the CROSS MOD modulator without changing the VOICE settings.

The motors can not be frequency modulated in audio rate with precision. Because of this the frequency cross modulation uses a division of the note frequency to produce sub-audio frequency modulation. However, the amplitude modulation (RING) portion of this effect uses the exact note frequency.

List of parameters

CROSS MODULATION is controlled with the **CROSS MOD** knob and **FM / RING** switch. The effect has a dedicated screen with additional parameters adjusted with the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE)**.

MOTOR-(M)-SYNTH

The lists below contain an overview of all parameters in this section. For further information refer to the Instructions sub-section.

Parameter	Control	Description	Value Range	
[DEPTH]	CROSS MOD knob	The depth of CROSS MOD. When turned counterclockwise V1 is the modulator. When turned clockwise V2 is the modulator	From -100 (V1 is modulator) through 0 (no CROSS MOD) to 100 (V2 is modulator)	
[FM / RING]	FM / RING switch	Toggle between frequency and amplitude modulation	"FM" frequency modulation; "RING" amplitude modulation	
Pulse Width [PW]	RIGHT SCREEN ENCODER (PLAY MODE)	The Pulse Width control of the modulator signal	From 0 to 1	
[SCALE]	RIGHT SCREEN ENCODER (PLAY MODE)	Octave offset of the modulator signal	From -2 to +5	

Instructions

Basic CROSS MOD usage

Turn the **CROSS MOD** knob to set the CROSS MOD [DEPTH] and use the **FM / RING** switch to choose the modulation type - frequency or amplitude.

The frequency and waveform of V2 will be used to modulate V1, so the effect is dependent on the **WAVE** and **SCALE** knobs in the <u>MOTOR CONTROLS</u> section.

Additional CROSS MOD parameters

To set the additional parameters enter the *CROSS MOD SCREEN* by turning the **CROSS MOD** knob and notice the momentary pop-up "XMOD SETT" on the upper-right corner of the screen. While the pop-up is displayed press the **RIGHT SCREEN ENCODER (PLAY MODE)** to enter the *CROSS MOD SCREEN*.



"XMOD SETT" pop-up while turning the CROSS MOD knob



Alternatively press the **PLAY MODE** encoder and then use the **LEFT SCREEN ENCODER (PRESETS)** to select "CROSS MOD SET"

PLRY	MODE	
CROSS MOD SET		ARP 🗄
DETUNE SET		560
IN ENV FOLLOW	MOTION	REC
ROUTE SET		
CV/TRIG SET		
MIDI ASSIGN		

PLAY MODE / CROSS MOD SET

The CROSS MOD SETTINGS SCREEN provides V2 frequency and waveform readout.



CROSS MOD SETTINGS SCREEN

Use the **RIGHT SCREEN ENCODER (PLAY MODE)** to set the Pulse Width [PW] and [SCALE] of the modulator signal. These parameters modify the waveform which is otherwise determined by the MOTOR VOICE'S [WAVE] and [SCALE] parameters.

The Pulse Width [PW] determines the pulse width of the waveform. This parameter is also available for non-square wave waveforms.

The [SCALE] parameter introduces octave offset for the modulator signal. Higher settings will introduce high frequency harmonics, but lower settings can introduce sub-audio rate cross modulation which will result in a note dependent tremolo effect.

DRIFT & DETUNE

Description

The MOTOR Synth offers two ways of individual motor detuning - DRIFT and DETUNE.

DRIFT is an irregular vibrato effect applied to each individual motor. Designed to emulate the warble and unstable behavior of vintage analog oscillators the effect is not limited to only mimicking instability. Chorusing and aggressive vibrato effects are equally possible. The MOTOR Synth achieves this effect in an analog way by modulating the speed of individual motors so that they drift around their target frequency.

DETUNE is also an analog effect achieved by introducing errors / offsets in the target frequencies of all motors. The random offsets are retriggered, so each new note is slightly sharp or flat. This results in a slightly more static effect with frequency beating and dissonances in higher settings. In lower settings the DETUNE can provide the subtle and musically pleasing instability not typically associated with perfectly tuned electronic instruments.

List of parameters

DRIFT and DETUNE effects do not have dedicated front panel controls. To access these effects press the **PLAY MODE** button and use the **LEFT SCREEN ENCODER (PRESETS)** to select "DETUNE SET". The *DETUNE SETTINGS SCREEN* contains all the effect parameters.

PLAY I	10DE	DE	TUNE	SETT	INGS	
CROSS MOD SET ODETUNE SET	ARP 0 Sed	DRIFT/DET	0 N	+50		
IN ENV FOLLOW ROUTE SET	MOTION REC	V2 DET Rate X	0N 1.00	0		
MIDI ASSIGN		DRIFT Detune	0	-50	V1 V2	

PLAY MODE / DETUNE SET

DETUNE SETTINGS SCREEN

Parameter	Control	Description	Value Range
[DRIFT/DETUNE]	LEFT SCREEN ENCODER (PRESETS)	The depth of DRIFT or DETUNE effect	From -50 to 0: depth of DRIFT From 0 to 50: depth of DETUNE
VI Status [VI DET]	LEFT SCREEN ENCODER (PRESETS)	MOTOR VOICE 1 effect status	"ON" "OFF"

V2 Status [V2 DET]	LEFT SCREEN ENCODER (PRESETS)	MOTOR VOICE 2 effect status	"ON" "OFF"
[RATE X]	LEFT SCREEN ENCODER (PRESETS)	The DRIFT frequency multiplier	From 0.06 to 16

Instructions

press the **PLAY MODE** button and use the **LEFT SCREEN ENCODER (PRESETS)** to select "DETUNE SET". The *DETUNE SETTINGS SCREEN* contains all the effect parameters.

PLRY MODE		DE	TUNE	SETTI	165	
CROSS MOD SET ©DETUNE SET IN ENY FOLLOW ROUTE SET	ARPI¢ Seo Motion Rec	▶ <mark>IORIFIYOET</mark> V1 Det V2 Det Rate X	0 0N 0N 1.00	+50		
CV/TRIG SET Midi Assign		DRIFT Detune	0	-50 -: L	vi vz	

PLAY MODE / DETUNE SET

DETUNE SETTINGS SCREEN

Push the LEFT SCREEN ENCODER (PRESETS) to select a parameter and turn the encoder to set the value.

[DRIFT/DETUNE] sets the depth of the effect.

Negative values produce DRIFT in which each motor is detuned by a separate LFO. The frequency of each motor's modulation is the same, but the phases are different giving a natural sounding effect.

Positive values produce DETUNE in which each motor is randomly detuned by a static offset each tie a new note is triggered.

The graph on the right side indicates the detuning of each motor.

DETUNE SETTINS					
DRIFT	-16	+50			
41 DET UP NET	ON NN	_			
RATE X	1.00	□ ₁ .0, 10.1			
DRIET					
DETUNE		-50			

The graph displays detuning of each motor

The [V1 DET] and [V2 DET] effect statuses allow you to switch the effect "ON" or "OFF" for each VOICE individually.

The [RATE X] parameter is a multiplier for the predefined DRIFT frequency. With setting below 1, the frequency is divided producing slow motor and digital oscillator pitch movement. Settings above 1 multiply the frequency producing more pronounced effects and can be utilized for chorusing effect.

PERFORMANCE INTERFACE

Description

The central element of the MOTOR Synth's performance interface is the non-velocity sensitive 8 key **KEYPAD** with four rotary **PITCH ENCODERS**. They are designed for playing musical phrases in real time, setting up drones and pads, as well as programming the built in <u>ARPEGGIATOR</u> and <u>SEOUENCER</u>.

On the surface the MOTOR Synth's **KEYPAD** might resemble a simplified version of a piano keyboard and it can in fact be used as one. However, combining the simple **KEYPAD** with numerous additional performance tools and parameters transforms it into a unique instrument capable of performances not typically possible on a piano keyboard.

Each **KEY** can be manually tuned to any musical note or frequency enabling both traditional western and microtonal scales. Alternatively, the whole **KEYPAD** can be instantly tuned with pre-programed musical scales.

The **PITCH ENCODERS** can be used both for setting up the **KEYPAD** and for real time performances detuning the **KEYS** as well changing the scale, root note and tuning quantization.

The LATCH key turns the KEYS into drones that can be tuned with the PITCH ENCODERS.

The **KEYPAD** is also an integral part of the <u>SEQUENCER</u> and <u>ARPEGIATOR</u> in which the **KEYPAD** changes its role from performance to programming. Furthermore, a short performance on the **KEYPAD** can be recorded, played back and looped using the <u>MOTION RECORD</u>. All of these are described in separate sections.

Finally, the MOTOR Synth introduces a unique permanence tool - the CLUTCH function while holding the **CLUTCH (TAP)** key. It toggles a temporary parameter editing buffer allowing silent parameter editing without disrupting the existing sound output. When the new parameter values are set the CLUTCH allows a sharp transition from the previous sound to the new one.



List of parameters

KEYPAD and PITCH ENCODER parameters

The notes are triggered with the **KEYPAD** which are tuned with the **PITCH ENCODERS.**

Parameter	Control	Description	Value Range
[KEY NOTE]	PITCH ENCODERS	The note value of each KEY	From E0 to B6
[LATCH]	LATCH button	KEY latch toggle	"ON" "OFF"
[OCTAVE SHIFT]	CLUTCH (TAP) + < / >	Octave shift of the KEYPAD	From 1 to 5
[SHIFT ALL]	ALT + turn PITCH ENCODER 1 / SHIFT ALL	Note shift of the KEYPAD	From E0 to B6
[STEP]	ALT + turn PITCH ENCODER 2 / FREQ STEP	PITCH ENCODER control quantization	"MICRO" Microtonal, unquantized; "CHROM" Quantized to chromatic scale; "SCALE" Quantized to the selected [SCALE]
[SCALE]	ALT + turn PITCH ENCODER 3 / SCALE	The scale of the assigned to the KEYPAD	"MAJOR" "MINOR" "HARM MIN" "BLUES PENT" "MINOR PENT" "MAJOR PENT" "DORIAN" "LYDIAN" "MIXOLYDIAN" "WHOLE TONE" "BP 833"
[ROOT]	ALT + turn PITCH ENCODER 4 / ROOT	The root note of the selected [SCALE]	From C to B

KEYPAD SETUP parameters

The *KEYPAD SETUP SCREEN* provides control over notes, scales and **PITCH ENCODER** quantization. Push the **POLY MODE** button and then push the **> arrow** button to access the *KEYPAD SETUP SCREEN*.

This list contains an overview of all parameters in this section. For further information refer to the Instructions sub-section.

Parameter	Control	Description	Value Range
[ROOT]	LEFT SCREEN ENCODER (PRESETS)	The root note of the selected [SCALE]	From C to B
[SCALE]	LEFT SCREEN ENCODER (PRESETS)	The scale of the assigned to the KEYPAD	"MAJOR" "MINOR" "HARM MIN" "BLUES PENT" "MINOR PENT" "MAJOR PENT" "DORIAN" "LYDIAN" "MIXOLYDIAN" "WHOLE TONE" "BP 833"
[STEP]	LEFT SCREEN ENCODER (PRESETS)	PITCH ENCODER control quantization	"MICRO" Microtonal, unquantized "CHROM" Quantized to chromatic scale "SCALE" Quantized to the selected [SCALE]
[DETUNE MIN]	LEFT SCREEN ENCODER (PRESETS)	The lowest possible interval for TUNE VOICE 2	From -100 cents to -1200 cents
[DETUNE MAX]	LEFT SCREEN ENCODER (PRESETS)	The highest possible interval for TUNE VOICE 2	From 100 cents to 1200 cents

POLY SETUP parameters

The *POLY SETUP SCREEN* provides control over the polyphony settings of each VOICE. Push the **POLY MODE** button to access the *POLY SETUP SCREEN*

Parameter	Control	Description	Value Range
Release to stolen note [REL TO STOLEN]	LEFT SCREEN ENCODER (PRESETS)	Release to stolen note, as polyphony slots free up	"ON" "OFF"
[VI POLY]	RIGHT SCREEN ENCODER (PLAY MODE)	MOTOR VOICE 1 polyphony setup	"UNI" Monophonic "DUO" Duophonic "POLY" Polyphonic
[V2 POLY]	RIGHT SCREEN ENCODER (PLAY MODE)	MOTOR VOICE 2 polyphony setup	"UNI" Monophonic "DUO" Duophonic "POLY" Polyphonic

NOTES TO VOICES parameters

The NOTES TO VOICES SCREEN provides control over performance tool assignment to VOICES. Push the **POLY MODE** button and then push the **> arrow** button twice to access the NOTES TO VOICES SCREEN.

Parameter	Control	Description	Value Range
KEYPAD status per voice [KEYS]	LEFT SCREEN ENCODER (PRESETS)	Individual KEYPAD status per VOICE	"ON" "OFF"
MIDI channel per voice [MIDI]	LEFT SCREEN ENCODER (PRESETS)	Individual MIDI channel setting per VOICE	MIDI channels 1-16 "ALL" "OFF"
SEQUENCER status per voice [SEQ]	LEFT SCREEN ENCODER (PRESETS)	Individual SEQUENCER status per VOICE	"ON" "OFF"
ARPEGIATOR status per voice [ARP]	RIGHT SCREEN ENCODER (PLAY MODE)	Individual ARPEGGIATOR status per VOICE	"ON" "OFF"

Instructions

Basic KEYPAD and PITCH ENCODERS functionality

The keys on the **KEYPAD** are referred to as **KEY 1 - 4** for row 1 and **KEY 5 - 8** for row 2.

Each **KEY** can be in one of three states:

- 1. OFF (no illumination),
- 2. SELECTED (white illumination)
- 3. ON (red illumination).



Note values of each **KEY** are indicated in the *MAIN PLAY SCREEN*. The screen is active after the MOTOR Synth is powered on. To return to the *PLAY SCREEN* from another screen, press the **EXIT (POLY MODE)** button. In the example below the **KEYPAD** is tuned to C minor scale and all of the **KEYS** are in OFF state.



C minor scale, all KEYS inactive

As soon as any **KEY** is pressed it is illuminated red and the corresponding note is highlighted in the *PLAY SCREEN*. The oscilloscope monitors the output waveform.



KEYS1&8 pressed

The *PLAY SCREEN* doubles as an information display for <u>MASTER TEMPO</u>, <u>SEQUENCER</u> and <u>ARPEGGIATOR</u> states, current <u>PRESET</u> name and other information. For more information refer to the corresponding sections.

The **PITCH ENCODERS** are referred to as **PITCH ENCODER 1 - 4**. Each **PITCH ENCODER** is used to tune the two **KEYS** in the column below the encoder. The **PITCH ENCODERS** can tune any **KEY** to any note or frequency including microtonal adjustments. The tuning process can be part of both **KEYPAD** setup and performance.



KEYS 1, 2, 3 & 8 are tuned to in-between notes creating a microtonal scale

The **PITCH ENCODER** will tune the **KEY** which was last played in the respective column. This **KEY** is indicated by a white marker line above or below the note value in the *PLAY SCREEN*.

In the example below in columns 1, 2, and 3 the top row **KEYS** are active **(KEYS 1, 2, 3)**, and in column 4 the bottom row note is active **(KEY 8)**. This means that turning the **PITCH ENCODERS 1, 2, 3**, will adjust the note values of **KEYS 1, 2, 3**, whereas turning **PITCH ENCODER 4** will adjust the note value of **KEY 8**.



KEYS 1, 2, 3 & 8 activated indicated by the thick marker above/below the note

It is possible to assign the **PITCH ENCODER** to the other **KEY** which is not the last one played in the column. Hold **CLUTCH (TAP)** and tap the inactive **KEY**. Release **CLUTCH (TAP)** and use the **PITCH ENCODER** on the assigned **KEY**. In the example above, holding **CLUTCH (TAP)** and tapping **KEY 4** will only change the active **KEY** status for **PITCH ENCODER 4** without triggering a new note on the **KEYPAD**. Release **CLUTCH (TAP)** and turn the **PITCH ENCODER** to tune the selected **KEY**.

Push a **PITCH ENCODER** to restore the value of the **KEY** back to its preset value.

Fip: The possibility to push a **PITCH ENCODER** to restore preset **KEY** note value enables **PITCH ENCODERS** be used for detuning and pitch bends during a performance, as it is possible to instantly return back to preset value and carry on with the performance.

To OCTAVE SHIFT the whole **KEYPAD** hold **TAP** and push the **< / > arrow** buttons for octave shifting down and up respectively. The OCTAVE SHIFT will occur as soon as the **CLUTCH (TAP)** button is released and the octave shift will also affect the currently played notes. This allows for octave shift spanning several octaves without audibly going through each octave. Furthermore, the OCTAVE SHIFT is affected by the <u>ACCELERATION</u> settings. So it is possible to perform gliding octave shifts. These functions distinguish the OCTAVE SHIFT from [SCALE] parameters. The selected octave is indicated by a number on the left from the **KEY** note values in the *PLAY SCREEN*.



KEYPAD OCTAVE SHIFT to the 5th octave

ALT + PITCH ENCODER USES - SHIFT ALL, FREQ STEP, SCALE and ROOT

The **PITCH ENCODERS** have several additional setup and performance functions vai the **ALT** button.

ALT + turn **PITCH ENCODER 1 / SHIFT ALL** continuously shifts note values of the whole **KEYPAD**. **ALT +** pressing **PITCH ENCODER 1 / SHIFT ALL** restores the original note values.

ALT + turn PITCH ENCODER 2 / FREQ STEP to change the PITCH ENCODER quantization. "MICRO" Microtonal setting allows PITCH ENCODERS to gradually tune the KEYS without quantization, thus microtonal tunings are possible. "CHROM" Chromatic setting quantizes PITCH ENCODERS to the chromatic scale. "SCALE" setting quantizes PITCH ENCODERS to the selected [SCALE].

ALT + turn PITCH ENCODER 3 / SCALE to choose one of the pre-programmed scales.

ALT + turn PITCH ENCODER 4 / ROOT to choose the root note for the selected scale.



KEYPAD SETUP

The *KEYPAD SETUP SCREEN* duplicated the alternative **PITCH ENCODER** functions on one screen. Push the **POLY MODE** button and then push the **> arrow** button to access the *KEYPAD SETUP SCREEN*.

LY SETUP	< RE	YPAD	SETL	IP > 0	10TES TO
ROOT			С		
SCALE		MRJC	12		
STEP		SCAL	E		
DETUNE	MIN	-150			
DETUME	MHX			_	
< 3 >		03	×	F3	10E 0
	5	HΞ	83	64	BPM

KEYPAD SETUP SCREEN

All parameters controlled with the **LEFT SCREEN ENCODER (PRESETS).**

[ROOT] determines the root note for the selected [SCALE]. All notes of the chromatic scale are possible.

[SCALE] is a selection of pre-programmed musical scales.

[STEP] determines the **PITCH ENCODER** pitch quantization for tuning the **KEYS** and KEYPAD SHIFT. "MICRO" Microtonal setting allows **PITCH ENCODERS** to gradually tune the **KEYS** without quantization, thus microtonal tunings are possible. "CHROM" Chromatic setting quantizes **PITCH ENCODERS** to the chromatic scale. "SCALE" setting quantizes **PITCH ENCODERS** to the selected [SCALE].

[DETUNE MIN] determines the lowest possible **TUNE VOICE 2** interval.

[DETUNE MAX] determines the highest possible **TUNE VOICE 2** interval.

KEYPAD LATCH

By default the **KEYPAD** works similarly to other key instruments, the note gate length is determined by how long a key is held pressed. The **LATCH** button toggles the LATCH mode, on which the **KEYS** function as ON/OFF switches for the notes.





In the LATCH mode all notes activated on the MOTOR Synth's **KEYPAD** will hold their ON state indefinitely (indicated by the red **KEY** illumination). Press the active **KEY** again to return to the OFF state. At this point the note will enter its respective AMP ENVELOPE Release [R] stage. The LATCH mode does not apply to notes that are triggered via MIDI or external controllers.

Holding the **ALT** button allows to retrigger the envelopes of already active **KEYS** and play new momentary notes while keeping the already LATCHED notes ON.

Tip: During the LATCH mode the **KEYPAD** can still be tuned using the **PITCH ENCODERS.** This is useful for creating drones, detuning layers and exploring beat frequencies especially with additional <u>VOICE DETUNING</u> and <u>CROSS MODULATION</u>.

Note: The polyphony slots need to be considered in the LATCH mode. If more than four **KEYS** are activated all polyphony slots are taken and note stealing will occur. Refer to <u>POLY SETUP</u> for more information.

CLUTCH (TAP)

The MOTOR Synth's innovative CLUTCH function hidden behind the **CLUTCH (TAP)** key acts as a temporary parameter editing buffer for creating timed and sharp parameter transitions including note and pattern changes.

Press and hold the **CLUTCH (TAP)** key to delay all real-time parameter changes made with **KNOBS**, **ENCODERS** and **KEYS** and apply all parameter changes made as soon as the **CLUTCH (TAP)** key is released. This allows for parameter changes during a performance without the audible effect turning the knob. The **CLUTCH (TAP)** key press and release are indicated by a temporary pop-up on the screen.



CLUTCH pop-up

There is no limit to how many parameters can be changed while the **CLUTCH (TAP)** key is held pressed, so the sound can be dramatically changed with several parameters at once with all changes taking place simultaneously and instantly as the **CLUTCH (TAP)** key is released. Because there is no audible feedback of parameter changes while the **CLUTCH (TAP)** key is held pressed, it requires developing muscle memory to fully utilize this feature with predictable outcome. Below are some musical tips.

W Tip 1: Create a MUTE effect by holding the CLUTCH (TAP) key pressed and rolling off the VOLUME knob of one ot VOICES. You will hear a sudden drop in volume only as the CLUTCH (TAP) key is released instead of gradual decrease in volume.
Tip 2: Another obvious use-case would be to use the CLUTCH (TAP) key to quickly open the FILTER [CUTOFF] during a "drop".
Fip 3: Turn on the LATCH function and create a drone by activating a few KEYS. Press and hold the CLUTCH (TAP) key and use ALT + PITCH ENCODER 1 to shift the KEYPAD note values, change the [SCALE] of MOTOR VOICE 1, and increase the FILTER [DRIVE]. Releasing the CLUTCH (TAP) key will trigger all three parameter changes at once.

POLY SETUP

The POLY SETUP SCREEN provides control over the polyphony settings of each VOICE. To access the POLY SETUP SCREEN push the **POLY MODE** button.



POLY SETUP SCREEN

The polyphony settings are controlled with the **RIGHT SCREEN ENCODER (PLAY MODE).** Each voice has 3 possible [POLY] settings:

- "POLY" four note polyphony. Each note is generated with one motor.
- "DUO" duophonic. Each note is generated with two motors.
- "UNI" unison / monophonic. Each note is generated with 4 motors.

The MOTOR VOICE polyphony setting greatly influences the core sounds. As each motor has a slightly different output, consequently mixing two motors per note in the "DUO" setting or 4 motors in the "UNI" setting produces a more powerful output.

When performing with the <u>SEQUENCER</u> and <u>ARPEGGIATOR</u> that are monophonic in nature the polyphony setting affects how overlapping <u>AMP ENVELOPE</u> Releases [R] function. In the "POLY" mode it is possible to trigger 4 steps in the SEQUENCER or ARPEGGIATOR with overlapping AMP ENVELOPE Releases [R] before AMP ENVELOPE RESET occurs. In the "UNI" mode it is impossible to overlap note Releases [R] as all motors with corresponding AMP ENVELOPES are taken up by a single step.

The note stealing setting [REL TO STOLEN] is controlled with the **LEFT SCREEN ENCODER (PRESETS).** This parameter determines how note stealing occurs as all polyphony slots are taken with active notes. In the "ON" setting the MOTOR Synth keeps the stolen note in buffer memory and as polyphony slots are freed up, the stolen notes are retriggered. In the "OFF" setting, the stolen notes are not retriggered when polyphony slots free up.

NOTES TO VOICES SETUP

By default each voice can be controlled by the built in <u>KEYPAD</u>, <u>ARPEGGIATOR</u>, <u>SEQUENCER</u> and external <u>MIDI</u> controllers at the same time. However, it is possible to detach each of these performance tools from individual VOICES. This allows you to utilize each VOICE as separate instruments controlled by a different performance tool or a combination of tools. Musical tips follow the instructions.

The NOTES TO VOICES SCREEN provides control over the performance tool assignment for each VOICE. To access the NOTES TO VOICES SCREEN push the **POLY MODE** button and then push the **> arrow** button twice.

PRD SI	atur < M	IOTES	TO 40IC	ES
	<keys></keys>	MiDi	5EU.	RRP
				OFF
	+			~ · —
191	он	C H I	014	⊕⇒ on e
ΨZ	0,N	CH1	ЦŅ	⊕÷ on

NOTES TO VOICES SCREEN

The **LEFT SCREEN ENCODER (PRESETS)** controls the KEYPAD [KEYS], MIDI channel [IDI] and SEQUENCER [SEQ] assignment for each individual VOICE. Push the **< / >arrow** buttons to navigate between the performance tools. Push the **LEFT SCREEN ENCODER (PRESETS)** to navigate between individual VOICES and turn the same encoder to toggle between "ON" and "OFF" or to dial in the desired MIDI Channel.

The **RIGHT SCREEN ENCODER (PLAY MODE)** controls the ARPEGGIATOR [ARP] assignment for each individual VOICE. Push the **RIGHT SCREEN ENCODE** to navigate between VOICES and turn the same encoder to toggle between "ON" and "OFF"

Tip 1 - Simultaneous arpeggios and chord pads: Setup the MOTOR VOICE 1 for synth pads with smooth AMP ENVELOPE Attack [A] and long Release [R]. Setup the MOTOR VOICE 2 for rhythmic playing with sharp AMP ENVELOPE Attack [A] and quick Release [R]. Navigate to the *NOTES TO VOICES SCREEN* and set the [ARP] to "OFF" for the MOTOR VOICE 1. When performing chords with the KEYPAD and the <u>ARPEGGIATOR</u> enabled, the V1 will hold all notes of the chord, while the V2 will arpeggiate through the chord notes.

Tip 2 - Simultaneous sequence and lead line: Setup the MOTOR VOICE 1 as bass sound and setup the MOTOR VOICE 2 as a lead sound. Navigate to the *NOTES TO VOICES SCREEN*. Set the [SEQ] to "OFF" for V1 and "ON" for V2. Set the [KEYS] to "ON" for V1 and "OFF" for V2. This allows the use of the <u>SEQUENCER</u> only for MOTOR VOICE 1 while the MOTOR VOICE 2 remains freely performable with he KEYPAD as a lead voice.

Tip 3 - Separate MIDI controllers for each VOICE: It possible to utilize a MIDI controller that can send note values via several MIDI channels or use several MIDI controlled through a MIDI merger to control each voice individually. One MIDI controller might be a traditional MIDI keyboard for lead line performance with MOTOR VOICE 1 and another MIDI controller might be a step sequencer for the MOTOR VOICE 2. To set up individual MIDI channels for each voice, navigate to *NOTES TO VOICES SCREEN* and set up the desired MIDI channels for each voice individually.

MASTER TEMPO

Description

The MASTER TEMPO (BPM) is used for triggering and synchronizing the rhythmic performance tools <u>SEQUENCER</u> and <u>ARPEAGGIATOR</u> as well as providing optional clock signal for the <u>MODULATORS</u> and <u>MOTION RECORD</u>. The MASTER TEMPO can be replaced with an incoming <u>MIDI</u> clock or it can be used as a master MIDI clock to synchronize external MIDI devices. The MASTER TEMPO is saved in PROJECTS rather than PRESETS. Please refer to the <u>PRESETS and PROJECTS</u> section for more information.



List of parameters

The MASTER TEMPO is controlled with the **MASTER TEMPO** encoder with additional MIDI clock parameters in the *MASTER TEMPO SCREEN*. To access the *MASTER TEMPO SCREEN* push the **MASTER TEMPO** encoder. Rest of the MIDI parameters are covered in the <u>SETTINGS MENU</u> and <u>MIDI IMPLEMENTATION</u> sections.

Parameter	Control	Description	Value Range
Master tempo [MSTR BPM]	MASTER TEMPO encoder or	Master tempo in BPM	From 20 to 420

Parameter	Control	Description	Value Range
	tap ALT + TAP at least 3 times.		
MIDI clock receive [MIDI RT IN]	LEFT SCREEN ENCODER (PRESETS)	Determines if external MIDI clock is received	"ON" - Receiving "FILT" - Not receiving
MIDI clock transmit [CLOCK]	RIGHT SCREEN ENCODER (PLAY MODE)	Determines if the MASTER TEMPO is transmitted as MIDI clock.	"ON" - Transmitting "FILT" - Not transmitting
MIDI clock transmit during STOP [WHEN STOP]	RIGHT SCREEN ENCODER (PLAY MODE)	Determines if the MASTER TEMPO is transmitted as MIDI clock during STOP	"ON" - Transmitting "OFF" - Not transmitting
START/STOP MIDI transmit [START/STOP]	RIGHT SCREEN ENCODER (PLAY MODE)	Determines if the START & STOP MIDI messages are transmitted	"ON" - Transmitting "FILT" - Not transmitting

Instructions

Setting the MASTER TEMPO (BPM)

There are two ways for setting the MASTER TEMPO (BPM).

First, by using the **MASTER TEMPO**. Push the encoder to open the *MASTER TEMPO SCREEN* and then turn the encoder to gradually adjust the BPM in increments of 1 BPM. For finer resolution hold **ALT** and turn the encoder t9 adjusts the BPM in decimal increments.



MASTER TEMPO SCREEN

Second, by using tap tempo. Hold **ALT** and rhythmically tap **TAP** at least 3 times to tap tempo.

Both BPM adjustment methods are designed to avoid accidental tempo changes.



The BPM is always displayed in the main *PLAY SCREEN* and it is used to trigger and synchronize the <u>ARPEGGIATOR</u>, <u>SEQUENCER</u> and optionally <u>MOTION RECORD</u> and <u>MODULATION</u>.



MASTER TEMPO readout in the bottom-right corner of the MAIN PLAY SCREEN

MIDI clock receive settings

Push the **MASTER TEMPO** encoder to navigate to the *MASTER TEMPO SCREEN* and turn the **LEFT SCREEN ENCODER (PRESETS)** to change MIDI clock receive settings (MIDI CLK IN). Set the [MIDI RT IN] to "ON" to receive the MIDI clock or set it to "OFF" to filter out the incoming MIDI clock.

MIDI clock transmit settings

Push the **MASTER TEMPO** encoder to navigate to the *MASTER TEMPO SCREEN* and use push the **RIGHT SCREEN ENCODER (PLAY MODE)** to highlight one of the MIDI clock transit parameters (MIDI CLK OUT) and turn the encoder to change parameter values.

Set [CLOCK] to "ON" to transmit the MIDI clock.

[WHEN STOP] determines if the MIDI clock is transmitted while the MOTOR Synth is STOP mode with the <u>SEQUENCER</u> and <u>MOTION RECORD</u>. By default [WHEN STOP] is set to "OFF". Change the value to "ON" to transmit the MIDI clock at all times if the [CLOCK] parameter is set to "ON"

[START/STOP] determines if the START & STOP MIDI messages are transmitted.

ARPEGGIATOR

Description

The MOTOR Synth's ARPEGGIATOR is a powerful built-in performance tool that works in conjunction with all internal and external note input methods / devices.

It will arpeggiate all notes triggered by the built in <u>KEYPAD</u>, <u>SEQUENCER</u>, <u>MOTION RECORD</u> and <u>MIDI</u> keyboard controllers and sequencers. In other words, the ARPEGGIATOR does not replace other performance tools, rather it uses them as note input for generating arpeggios.

The ARPEGGIATOR is accessed by pressing the **PLAY MODE** button and selecting "ARP".

The ARPEGCIATOR settings include control over typical arp parameters, such as tempo subdivision, gate length, swing, play direction, octave shifts, etc. Furthermore, MOTOR Synth allows you to edit the ARPEGCIATOR'S rhythm pattern separately from the melodic pattern.

List of parameters

All of the ARPEGGIATOR parameters are organized into two screens - *ARP SCREEN* and *ARP RHYTHM SCREEN*. This section is organized in two parts accordingly.

Ths lists contain an overview of all parameters in this section. For further information refer to the Instructions sub-section.

Main melodic ARP parameters

The ARPEGGIATOR is activated by pressing the **PLAY MODE** button and selecting "ARP". To turn the ARPEGGIATOR ON set the [ARP] to "ON"

ARP RHYTHM	< ARP	(0N)	
		ARP	ON C
N REPERT	OFF	MODE	UP
PAT LEN	MRX	TIMEDIV	118
RCCENT	OFF	GATE L	50
OCT RANG	E 🛛	SWING	50

{ARP} set to "ON"

Parameter	Control	Description	Value Range
Arp Status [ARP]	RIGHT SCREEN ENCODER (PLAY MODE)	ARPEGGIATOR status	"ON" "OFF"

Play mode [MODE]	RIGHT SCREEN ENCODER (PLAY MODE)	Play direction mode	 "UP" up from the lowest note to the highest; "DOWN" down from the highest note to the lowest; "INCL" up and down including first and last note repeat (aka ping pong); "EXCL" up and down excluding first and last note repeat (aka pendulum); "ORDER" in the order of notes activated; "RAND" in random order; "V RAND" random order for each VOICE separately
Time Division [TIMEDIV]	RIGHT SCREEN ENCODER (PLAY MODE)	The time division of MASTER TEMPO	From 1/4 to 1/32
Gate Length [GATE L]	RIGHT SCREEN ENCODER (PLAY MODE)	Gate length in percent	From 10 to 100
[SWING]	RIGHT SCREEN ENCODER (PLAY MODE)	Swing amount. The delay of odd or even step triggers within one clock subdivision interval	From 10 (every odd step delay) through 50 (no delay/swing) to 90 (every even step delay)
Note Repeat [N REPEAT]	LEFT SCREEN ENCODER (PRESETS)	The number of note repeats	From "OFF" to "4x"
Pattern Length [PAT LEN]	LEFT SCREEN ENCODER (PRESETS)	The maximum number of pattern steps. Note repeats are treated as one step	"MAX" unlimited number of steps. From 2 to 8
[ACCENT]	LEFT SCREEN ENCODER (PRESETS)	Accented step	"1/4", "2/4" "3/4" "4/4" "1/3", "2/3". "3/3" "1/2", "2/2"

Octave Range [OCT RANGE]	LEFT SCREEN ENCODER (PRESETS)	Octave range of pattern shift	From -2 (two octaves below) through 0 (no octave shifting) to 2 (two octave above)
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ARP RHYTHM parameters

It is possible to edit the rhythmic pattern separately from the melodic pattern. The ARP RHYTHM pattern edit is performed using the **KEYPAD** and **PITCH ENCODERS** that change their functions in the *ARP RHYTHM SCREEN*. To access the *ARP RHYTHM SCREEN* press the **PLAY MODE** button and select "ARP" and then navigate one page to the left by pushing the **< arrow** button.

Parameter	Control	Description	Value Range	
Velocity [VEL]	PITCH ENCODER 1	Individual step velocity	From 0.0 to 1.0	
Ratchets [RATCH]	PITCH ENCODER 2	The number of ratchets for an individual step following the initial step trigger	From 1 to 4	
Ratchet note advance [R ADV]	PITCH ENCODER 3	The toggle of melodic pattern advance on each single ratchet for an individual step	"OFF" - ratchets do not advance the melodic pattern; "ON" - ratchets advance the melodic pattern	
Probability [PROB]	PITCH ENCODER 4	Gate probability of an individual step	From 0.0 to 1.0	
Automatic step selection [SEL]	ALT + PITCH ENCODER 1	Automatic multiple step selection	"ALL" all step selection; "C-1-3" 1st and 3rd column step selection; "C-2-4" 2nd and 4th column step selection; "R-1-3" 1st and 3rd row step selection; "R-2-4" 2nd and 4th row step selection; "CLEAR" clear step selection	
[MUTE]	ALT + PITCH ENCODER 2	Mute gate for an individual step"ON" "OFF"		
Pattern Length	ALT + PITCH	The number of steps in	"OFF"	

[LEN]	ENCODER 3	ARP RHYTHM pattern.	From 1 o 16
Time Division	ALT + PITCH	The time division of	From 1/4 to 1/32
[TIMEDIV]	ENCODER 4	MASTER TEMPO	

Instructions

Basic ARPEGGIATOR usage

The ARPEGGIATOR is activated by pressing the **PLAY MODE** button and selecting "ARP". To turn the ARPEGGIATOR ON set the [ARP] to "ON"

ARP RHYTHM	< ARP	(ON)	
		ARP	ON C
▶ N REPERT PRT LEN RCCENT DCT RANGE	OFF MAX OFF	MODE TIMEDIY GATE L Swing	UP 118 50 50

[{]ARP} set to "ON"

If you exit the *ARP SCREEN* without setting [ARP] to "OFF" the ARPEGGIATOR remains active indicated by the "ARP" tag in the *MAIN PLAY SCREEN*.



"ARP" tag in the upper-right corner of the MAIN PLAY SCREEN indicates active ARPEGGIATOR

While the ARPEGGIATOR is active, all notes triggered by the <u>KEYPAD</u>, <u>SEQUENCER</u>, <u>MOTION RECORD</u> and external <u>MIDI</u> controllers will be arpeggiated. If several notes are triggered at the same time from more than one note input source, the ARPEGGIATOR will combine all of them in one melodic ARP pattern. It is possible to deactivate the ARRPEGIATOR on one of the VOICES. For more information refer to the <u>PERFORMANCE</u> <u>INTERFACE / NOTES TO VOICES</u> section.

Fip: When playing the ARPEGGIATOR with <u>LATCH</u> mode enabled - you can use **ALT + KEYPAD** to temporarily add notes into the ARP's melodic sequence. To reset the ARPEGGIATOR to the first note in the sequence press **ALT + PLAY**.

The ARPEGGIATOR is monophonic, since only one note is played at a time. However, when the the MOTOR Synth is being played in polyphonic mode it is possible to create overlapping <u>AMP ENVELOPE</u> Release [R] states for multiple several notes, if the Release [R] time is longer than a single ARPEGGIATOR step (determined by the [TIMEDIV] parameter). For further information please refer to the <u>PERFORMANCE</u> <u>INTERFACE / POLY SETUP</u> section.

ARP SCREEN parameter editing

The ARPEGGIATOR parameters are controlled from the *ARP SCREEN*. The ARPEGGIATOR is accessed by pressing the **PLAY MODE** button and selecting "ARP". Use the **RIGHT SCREEN ENCODER (PLAY MODE)** to set the following four parameters.

ARP RHYTHM	< ARP	(0N)	
		ARP	ON C
N REPERT	OFF	MODE	UP
	MRX	Timediy	1116
ACCENT	OFF	GATE L	50
Oct Range	0	Swing	50

ARP SCREEN

[MODE] determines the melodic pattern playback direction:

"UP" up from the lowest note to the highest

"DOWN" down from the highest note to the lowest

"INCL" up and down including first and last note repeat (aka ping pong)

"EXCL" up and down excluding first and last note repeat (aka pendulum)

"ORDER" in the order of notes activated

"RAND" in random order

"V RAND" in random order for each VOICE separately.

[TIMEDIV] determines the ARPEGGIATOR trigger subdivision in relation to the MASTER TEMPO.

[GATE L] determines the gate length of each ARPEGGIATOR step.

Tip: The "V RAND" [MODE] can be used for random harmony generation. When several notes are being played together, then at each new ARPEGGIATOR step each VOICE will randomly select one of the notes thus producing different 2-note harmonies on each step, when both VOICES are engaged. This can be combined with a slow <u>MASTER TEMPO</u>, small [TEMPO DIV], long [GATE L] and long <u>AMP ENVELOPE</u> Attack [A] and Release [R] stages for creating slowly evolving random harmony synth pads.

[SWING] determines the amount of swing added to the ARPEGGIATOR's basic rhythm pattern. The middle value 50 produces a straight rhythm, while lowering the parameter value results in delay of each odd numbered step trigger, and raising the value above 50 produces even numbered step trigger delay.

Use the LEFT SCREEN ENCODER (PRESETS) to set the following four parameters.
[N REPEAT] adds note/step repeats. Up to 4 repeats are possible.

[PAT LEN] limits the number of steps the ARPEGCIATOR loops. When set to "MAX" the melodic pattern length does not have an upper limit, whereas any other value sets a hard limit on the number of notes played in a pattern. If the [PAT LEN] is value larger than the number of active notes, the note sequence will be looped until the [PAT LEN] limit is reached and then the melodic pattern will reset. For example, if [PAT LEN] is set to 5 and only 3 notes are activated, then the melodic pattern will be: 12312/12312/12312/...

The [PAT LEN] limit adjusts to the [N REPEAT] parameter. If [N REPEAT] is greater than 1, then all note repeats are treated as one step.

[ACCENT] adds a velocity accent on a single step in groups of 4, 3 or 2 steps. For example, if [ACCENT] is set to "3/4" every 3rd step out of 4 will be accented.

[OCT RANGE] produces octave shifts for the whole note sequence. One or two octave shifts are possible in either direction.

ARP RHYTHM SCREEN step selection

MOTOR Synth allows you to edit the ARPEGGIATOR'S rhythm pattern separately from the melodic pattern. It is possible to create rhythmic patterns that repeat regardless of the number of active notes. To access the *ARP RHYTHM SCREEN* press the **PLAY MODE** button and select "ARP" and then navigate one page to the left by pushing the **< arrow** button.



ARP RHYTHM SCREEN

While the ARP RHYTHM SCREEN is open the **KEYPAD** functionality is changed. The **KEYPAD** does not activate and trigger notes, instead it is used to select the ARP RHYTHM steps.

Note: Since the **KEYPAD** does not activate notes while the *ARP RHYTHM SCREEN* is open, it is advised to enter a sequence of notes (using the **KEYPAD** in <u>LATCH</u> mode) before entering the *ARP RHYTHM SCREEN*. This will produce an ongoing melodic sequence that will remain active while you are editing the ARP RHYTHM pattern.

The ARP RHYTHM SCREEN contains a maximum of 16 rhythm steps. The steps are selected over 2 pages (groups) of 8 steps each by pressing the corresponding **KEYS. KEYS 1- 8** correspond to ARP RHYTHM steps 1-8. Press a **KEY** to select the corresponding ARP RHYTHM step. The selected step is indicated by the dotted line.





To select several steps press all corresponding **KEYS** simultaneously. Each time a **KEY** is pressed or several **KEYS** are pressed simultaneously, the previously selected steps are deselected. In the example below **KEYS 1** and **5** are pressed simultaneously to select steps 1 and 5.



STEPS 1 & 5 selected

To add more steps to the current selection without deselecting previous steps hold **ALT** and press the additional **KEYS** one by one.

To access ARP RHYTHM steps 9-16 turn the **CTRL** encoder to the right until the *ARP RHYTHM SCREEN* indicates that the PAGE 2 is active. Press **KEYS 1-8** to select steps 9-16. In the example below **KEYS 1** and **5** are pressed simultaneously to select steps 9 and 13.



STEPS 9 & 13 selected

To select steps in both PAGES, select the desired steps in one of the pages then turn the **CTRL** encoder to go to the other page and hold **ALT** and press the **KEYS** to add steps to the selection.

Alternatively when making a new selection, you can press and hold one or more STEP KEYS in one PAGE, and turn the **CTRL** encoder while the KEYS are still pressed down to select the same steps in the other PAGE. In the example below **KEYS 1** and **5** are pressed to select steps 1 and 5. While the **KEYS** are held pressed down, the **CTRL** encoder is turned to the right to activate PAGE 2 and automatically steps 9 and 13 are added to the selection. As a result all steps in the first column are selected.



STEPS 1, 5, 9 & 13 selected

To mute or unmute the selected steps press the **CTRL** encoder.

To deselect all steps, press any **KEY** twice.

ALT + PITCH ENCODER 1 offers more step selection possibilities described in the next section.

ARP RHYTHM SCREEN step editing

While a single or several steps are selected the **PITCH ENCODERS** are used to edit various step parameters instead of tuning the **KEYPAD.**

The **PITCH ENCODER** parameters are indicated in the bottom part of the *ARP RHYTHM SCREEN*. To avoid accidental parameter changes the **PITCH ENCODERS** must be first pressed to activate them and then turned to edit parameter values. Activating a **PITCH ENCODER** also turns on the corresponding parameter value readout for all steps.

PITCH ENCODER 1: Velocity [VEL]

Click and turn **PITCH ENCODER 1** to set the Velocity [VEL] of selected steps. The Velocity [VEL] value is indicated by a bar in each step and by a precise value readout in the lower part of the *ARP RHYTHM SCREEN*. Setting the [VEL] to 0 effectively silences the step. In the example below steps 1 and 5 have Velocity [VEL] set to 0.5.



STEPS 1 & 5 [VEL] set to 0.5

Note: The ARP RHYTHM Velocity [VEL] parameter works in conjunction with the Velocity [VEL]
parameters of <u>AMP ENVELOPES</u> , FILTER ENVELOPE and MODULATION ENVELOPE. If the ENVELOPE
Velocity [VEL] parameter is set to 0, then the ARP RHYTHM Velocity [VEL] will produce no effect (except
for silencing the step when set to 0). The ENVELOPE Velocity [VEL] functions as a response to the
Velocity [VEL] of the ARRPEGIATOR. If the ENVELOPE Velocity [VEL] is set to a negative value an inverse
effect is achieved. For further information refer to the <u>AMP ENVELOPE / Setting the ENVELOPE Velocity</u>
[VEL] section.

PITCH ENCODER 2: Ratchets [RATCH]

Click and turn **PITCH ENCODER 2** to add Ratchets [RATCH] to the selected steps. The Ratchet [RATCH] count is indicated by a number in each step. In the example below the [RATCH] Value is set to 2 and therefore there are 2 note gate triggers produced in total per selected step.



STEPS 1 & 5 with 2 ratchets

PITCH ENCODER 3: Ratchet note advance [R ADV]

Click and turn **PITCH ENCODER 3** to toggle Ratchet note advance [R ADV] "ON" or "OFF" for the selected steps. If set to "ON" the melodic sequence advances to the next note on each Ratchet [RATCH]. In the example below step 1 on has [R ADV] set to "ON", whereas the [R ADV] setting for step 5 remains set to "OFF". This results in rapid note changes on each ratchet of step 1 while all ratchets on step 5 trigger the same note.

ARP RHYTHM SIZE >								
	DN	OFF	OFF	OFF				
	DFF	OFF	OFF	OFF				
00551	OFF	OFF	OFF	OFF				
FNGC+ 1	OFF	OFF	OFF	OFF				
YEL	RATC	H OR	RDV	PROB				
0.5	2	0	N.	1.0				

STEP 1 [R ADV] ON

PITCH ENCODER 4: Probability [PROB]

Click and turn **PITCH ENCODER 4** to set the gate Probability [PROB] of the selected steps. The Probability [PROB] value is indicated by a bar in each step and by a precise value readout in the bottom part of the *ARP RHYTHM SCREEN*. Setting the [PROB] to 0 effectively produces a break each time the selected steps are active. In the example below step 1 has [PROB] set to 0.5 which means there is a 50% probability the step will be triggered, and step 5 is set to 0.1 which means the step will be triggered with 10% probability.



STEP 1 [PROB] set to 0.5, STEP 5 [PROB] set to 0.1

ALT + PITCH ENCODER 1: Quick multiple step selection

Hold **ALT** and turn the **PITCH ENCODER 1** to utilize the Quick Step Selection [SEL]. This function allows you to select multiple steps in useful groups. Turn the encoder to the right to select steps belonging to the one of the following groups:

"ALL" all step selection

"C-1-3" 1st and 3rd column step selection

"C-2-4" 2nd and 4th column step selection

"R-1-3" 1st and 3rd row step selection

"R-2-4" 2nd and 4th row step selection

Once the steps are selected use the other **PITCH ENCODERS** to change the parameters of all selected steps.

Pressing **ALT + KEYS** adds or removes steps from the Quick Step Selection.

To clear the selection release **ALT** momentarily, press and hold **ALT** again and turn the encoder to the left to select "CLEAR"

In the example below "C-2-4" automatic step selection is used to select all up-beat steps to then use **PITCH ENCODER 1** to reduce the Velocity [VEL] of these steps.



ALT + PITCH ENCODER 2: [MUTE]

Hold **ALT** and push the **PITCH ENCODER 2** to toggle [MUTE] "ON" and "OFF" for the selected steps. Step [MUTE] is indicated by blacked out steps on the *ARP RHYTHM EDIT SCREEN*. In the example below Steps 3 and 6 are muted.



Steps 3 & 6 MUTE ON

ALT + PITCH ENCODER 3: Pattern Length [LEN]

Hold **ALT** and turn the **PITCH ENCODER 3** to set the total ARP RHYTHM Pattern Length [LEN] between 1 and 16 or "OFF" which bypasses the ARP RHYTHM step parameters completely. The [LEN] value is indicated by a cursor that moves to the pattern end point and by the value readout in the bottom part of the *ARP RHYTHM SCREEN*. The [LEN] parameter does not affect the melodic sequence [PAT LEN], and only applies to the ARP's Rhythm pattern. In the example below [LEN] is set to 10 steps which is indicated by the cursor location at step 10.



[LEN] set to 10

ALT + PITCH ENCODER 4: Time Division [TIMEDIV]

Hold **ALT** and turn the **PITCH ENCODER 4** to set the ARPEGGIATOR step subdivision in relation to the <u>MASTER TEMPO</u>. This is the same parameter as [TIMEDIV] in the main *ARP SCREEN*. Changes to either of these parameters produce the same result.



[TIMEDIV] set to 1/32 notes

SEQUENCER

Description

The MOTOR Synth features an internal monophonic step sequencer that can be used to create, edit and store melodies, basslines, songs.

The SEQUENCER PATTERN EDIT SCREEN has a similar workflow to the <u>ARP RHYTHM</u> section of the ARPEGGIATOR where the **KEYPAD** and **PITCH ENCODERS** are used for step editing. The main principles of selecting and editing steps are the same for the SEQUENCER PATTERN EDIT SCREEN and ARPEGGIATOR ARP RHYTHM SCREEN, however, the SEQUENCER offers more step editing options and in general puts greater focus on composition and precise pattern chaining.

In addition to the step editing possibilities introduced in the ARP RHYTHM section, such as velocity, ratchets and probability, the SEQUENCER *PATTERN EDIT SCREEN* lets you set up variable glide, gate length, microtiming and step repeat values for each step.

All sequences created within the built in engine are composed out of individual PATTERNS that each have a maximum number of 16 steps. There are 8 PATTERN slots in total, and the PATTERNS can be edited, copied, transposed and chained into QUEUES. There are four QUEUE slots labeled A, B, C, D and each QUEUE can store a chain of up to 12 PATTERNS (1-8). All PATTERNS and QUEUES can be stored on the MOTOR Synth's SD Card as <u>PROJECTS</u>.

Instructions

Running the SEQUENCER

Enter the SEQUENCER by pressing the **PLAY MODE** encoder, then turning the encoder to highlight "SEQ" and then pressing the encoder again to select "SEQ".

PLAY	MODE
© EROSS MOD SET DETUNE SET IN ENV FOLLOW ROUTE SET CV/TRIG SET MIDI RSSIGN	ARP 591 Motion Rec

PLAY MODE > SEQ

The *PATTERN SCREEN* gives you control over all steps of a single SEQUENCER PATTERN as well as a few general SEQUENCER settings.



SEQUENCER PATTERN SCREEN

Use the **RIGHT SCREEN ENCODER (PLAY MODE)** to toggle the SEQUENCER State [SEQ] between "ON" or "OFF". When set to "ON" the SEQUENCER is activated, and will start running through the steps whenever the **PLAY** transport key is engaged (red).

When set to "OFF" the SEQUENCER is deactivated, which means that it will not advance through the steps even if the **PLAY** transport key is engaged.

The SEQUENCER State [SEQ] is a general parameter that applies to all PATTERNS within a <u>PROJECT</u>, and it is implemented in order to enable using the **PLAY** key for launching the <u>MOTION RECORD</u> engine without running the SEQUENCER, or vice versa.

Press **PLAY/STOP** to start and stop the SEQUENCER.

To reset the SEQUENCE press **ALT + PLAY**. Pressing **ALT + PLAY** acts as a RESET for the SEQUENCER, <u>ARPEGGIATOR</u> and all <u>MOTION RECORD</u> lanes.

PATTERN SCREEN step selection

The *PATTERN SCREEN* gives control over all steps of a single SEQUENCER PATTERN. Step selection is identical to the <u>ARP RHYTHM SCREEN</u> step selection.

While the *PATTERN SCREEN* is open the **KEYPAD** functionality is changed. The **KEYPAD** does not activate and trigger notes - instead it is used to select individual PATTERN steps.

Each PATTERN contains a maximum of 16 steps that are grouped into 2 pages, each containing 8 steps. There is a special PAGE 1 and PAGE 2 label on the left side of the PATTERN EDIT screen, as well as an indication bracket that contains either STEPS 1 - 8 or STEPS 9 - 16. You can select and edit steps in each page by pressing the corresponding **KEYS** on the **KEYPAD.** When PAGE 1 is selected, **KEYS 1 - 8** correspond to steps 1 - 8.

Press one or multiple **KEYS** to select the corresponding PATTERN steps. The selected step is indicated by the dotted line.

PTRNS	Ш	PATTE	RN 1	•	SED 4
PAT	(E3)	E3	E3	E3	ON
	E3	E3	E3	E3	DFF
1	E3	E3	E3	E3	P.T
	E3	E3	E3	E3	[+u
NOTE VEL	5	ATE LIDE	MICR	O PI H S'	ROB T REP

STEP 1 selected

To select several steps together press multiple corresponding **KEYS** simultaneously. Each time a **KEY** is pressed or several **KEYS** are pressed simultaneously, the previously selected steps are deselected. In the example below **KEYS 1** and **5** are pressed simultaneously to select steps 1 and 5.



STEPS 1 & 5 selected

To add more steps without deselecting previous steps hold **ALT** and press the **KEYS** one by one.

To access steps 9 - 16 turn the **CTRL** encoder to the right until the *PATTERN SCREEN* indicates that the PAGE 2 is active and the cursor has moved to the 3rd and 4th row. Press **KEYS 1 - 8** to select steps 9 -16. In the example below **KEYS 1** and **5** are pressed simultaneously to select steps 9 and 13.



STEPS 9 & 13 selected

To select steps in both PAGES, select the desired steps in one of the pages then turn the **CTRL** encoder to go to the other page and hold **ALT** and press the **KEYS** to add steps to the selection.

Alternatively when making a new selection, you can press and hold one or more **KEYS** in one PAGE, and turn the **CTRL** encoder while the KEYS are still pressed down to select the same steps in the other PAGE. In the example below **KEYS 1** and **5** are pressed to select steps 1 and 5. While the **KEYS** are held pressed down, the **CTRL** encoder is turned to the right to activate PAGE 2 and automatically steps 9 and 13 are added to the selection. As a result all steps in the first column are selected.



STEPS 1, 5, 9 & 13 selected

To mute or unmute the selected steps press the **CTRL** encoder.

To deselect steps, press any **KEY** twice.

ALT + PITCH ENCODER 1 offers more step selection possibilities described in the next section.

PATTERN EDIT SCREEN step editing

While a single or several PATTERN steps are selected the **PITCH ENCODERS** are used to change step parameters instead of tuning the **KEYPAD.** Using the *PATTERN EDIT SCREEN* to change Step parameters is similar to the <u>ARP RHYTHM</u> step editing, but with several differences.

The **PITCH ENCODER** parameters are indicated in the bottom part of the *PATTERN SCREEN*. The **PITCH ENCODERS** must be first pressed to activate them and then turned to change parameter values. Each encoder controls two parameters that can be toggled by repeatedly pressing the encoder. An additional layer of PITCH ENCODER parameters is accessible when the **ALT** key is held down. Activating a **PITCH ENCODER** also turns on the corresponding parameter value readout for all steps.

PITCH ENCODER 1: [NOTE] & Velocity [VEL]

Click the **PITCH ENCODER 1** to toggle between the [NOTE] and Velocity [VEL] parameters and turn the encoder to set each parameter for the selected steps.

MOTOR-(M)-SYNTH

[NOTE] sets the note value of the selected steps. The [NOTE] value adjustments can be unquantized, quantized to the chromatic scale or quantized to the scale of the KEYPAD. This is fully dependent on the [STEP] setting in the <u>KEYPAD SETUP SCREEN</u>. If multiple steps with different [NOTE] values are selected then adjusting the [NOTE] of these steps simultaneously raises or lowers the pitch of each step maintaining the pitch differences between the selected steps.



STEP 1 [NOTE] set to D#3

The Velocity [VEL] value is indicated by a bar in each step. Setting the [VEL] to 0 effectively silences the step. In the example below steps 1 and 5 have Velocity [VEL] set to 0.5.



STEPS 1 & 5 [VEL] set to 0.5

Note: The SEQUENCER Velocity [VEL] parameter functions in conjunction with the Velocity [VEL] parameters of <u>AMP ENVELOPES</u>, <u>FILTER</u> ENVELOPE and <u>MODULATION</u> ENVELOPE. If the ENVELOPE Velocity [VEL] parameter is set to 0, then the SEQUENCER Velocity [VEL] will produce no effect (except for silencing the step when set to 0). The ENVELOPE Velocity [VEL] functions as a response to the Velocity [VEL] of the SEQUENCER. If the ENVELOPE Velocity [VEL] is set to a negative value an inverse effect is achieved. For further information refer to the <u>AMP ENVELOPE / Setting the ENVELOPE Velocity</u> [VEL] section.

PITCH ENCODER 2: Gate Length [GATE] & [GLIDE]

Press the **PITCH ENCODER 2** to toggle between the Gate Length [GATE] and [GLIDE] parameters and turn the encoder to set each parameter for the selected steps.

MOTOR-(M)-SYNTH

[GATE] determines the gate length of the note within one SEQUENCER step. The parameter values are indicated by horizontal bars in each step. Setting the [GATE] parameter of a step to the maximum value will tie that step to the next one. As a result all <u>ENVELOPES</u> of tied steps remain in their Sustain [S] stages and are not retriggered. In the first example below step 1 and 5 [GATE] is set short and in the second example the gates of the same steps are set to the maximum value tying them together with the gates of the following step.



[GLIDE] determines the amount of portamento applied to the selected step from the previous note. The parameter value is indicated by a horizontal bar in each step. The minimum value produces no portamento effect, whereas the maximum value will result in a long gliding effect between the two neighboring notes. In cases where two neighboring notes are set to the same [NOTE] value the portamento effect will not be heard. In the example below steps 1 and 5 have a moderate amount of [GLIDE] applied.

PTRNS	11	PATT	ERN 1		SED (
PAT	.).		•	DN FI M
PRGE	_				OFF
1		1			P.T
		1	ı		
NOTE VEL		IATE ILIDE	MICR	0	PROB St Rep

STEPS 1 & 5 with [GLIDE]

Note: The [GLIDE] parameter does not affect <u>ACCELERATION / BRAKE</u> functionality. As both modulate the pitch when a new note is triggered, the final result is a sum of both pitch modulations.

PITCH ENCODER 3: Microtiming [MICRO] & Ratchet [RATCH]

Press **PITCH ENCODER 3** to toggle between the Microtiming [MICRO] and Ratchets [RATCH] parameters and turn the encoder to set each parameter for the selected steps.

The Microtiming [MICRO] parameter is used to offset step triggers in time, allowing you to trigger each step early or to delay the trigger. Microtiming [MICRO] value is indicated by a cursor on a timeline within each step. In the center position the step is triggered precisely on the grid. Turning the encoder counterclockwise moves the cursor to the left and triggers the step early, whereas turning the encoder clockwise moves the cursor to the right and delays the step trigger. This allows for nuanced microtiming of each step and



escaping the precise rhythmic grid associated with step sequencers. The minimum and maximum [MICRO] settings move the note to trigger a half beat early or late, which triggers the step precisely on the upbeat. In the example below step 3 is triggered early and step 7 is delayed.



STEP 3 with early and STEP 7 with late Microtiming [MICRO]

Ratchet [RATCH] count is indicated by a number in each step. In the example below step 8 [RATCH] set to 4 produces four evenly spaced note triggers within the step.



STEP 8 with four Ratchets [RATCH]

Note: All ratchets are evenly spaced within the time of one step. However, this is affected by the Microtiming [MICRO] parameter. If the [MICRO] parameter triggers a step early, the previous step's time is shortened causing the ratchets of the previous step to trigger faster. Similarly, if the [MICRO] parameter delays a step the total length of that step is shortened resulting in ratchets being triggered faster than without Microtiming [MICRO].

PITCH ENCODER 4: Probability [PROB] & Step Repeat [ST REP]

Probability [PROB] determines the gate probability of the selected steps. The Probability [PROB] value is indicated by a bar in each step. Setting the [PROB] to 0 effectively produces a break each time the selected steps are active. In the example below step 4 has [PROB] set to the half-way position which triggers the step 50% of the time and step 5 [PROB] is reduced only slightly producing only occasional breaks on this step.



STEP 4 with 50% Probability [PROB] and STEP 5 with almost maximum [PROB]

ALT + PITCH ENCODER 1: Automatic multiple step selection

Hold **ALT** and turn **PITCH ENCODER 1** to utilize the automatic SEQUENCER PATTERN step selection. This function enables quick multiple step selection in useful groups. Turn the encoder to the right to select one of the following groups:

"ALL" all step selection "C-1-3" 1st and 3rd column step selection "C-2-4" 2nd and 4th column step selection "R-1-3" 1st and 3rd row step selection

"R-2-4" 2nd and 4th row step selection

Once the steps are selected use the other **PITCH ENCODERS** to change the parameters of all selected steps.

To clear the selection release **ALT** momentarily, press and hold **ALT** again and turn the encoder to the left to select "CLEAR"

In the example below "C-2-4" automatic step selection is used to select all up-beat steps to then use **PITCH ENCODER 1** to reduce the Velocity [VEL] of these steps.



"C-2-4" selects all steps in columns 2 & 4

[VEL] changes for all selected steps

ALT + PITCH ENCODER 2: [MUTE]

Hold **ALT** and press the **PITCH ENCODER 2** to toggle [MUTE] on and off for the selected steps. Step [MUTE] is indicated by blacked out steps. In the example below Steps 3 and 6 are mutes.

Alternatively the selected steps can be muted by pressing the CTRL encoder.



STEPS 3 & 6 muted

ALT + PITCH ENCODER 3: Pattern Length [LEN]

Hold **ALT** and turn **PITCH ENCODER 3** to set the total Pattern Length [LEN] between 1 and 16. The [LEN] value is indicated by a cursor that moves to the end point of the pattern. In the example below [LEN] is set to 10 steps which is indicated by the cursor after step 10.



Pattern Length [LEN] set to 10 steps

ALT + PITCH ENCODER 4: Time Division [DIV]

Hold **ALT** and turn the **PITCH ENCODER 4** to set the SEQUENCER PATTERN step subdivision in relation to the <u>MASTER TEMPO</u>.

PTRNS	Ш	PATTE	RN 1		SEO 🖣
PRT	E3	E3	E3	E3	ON
	E3	E3	E3	E3	OFF
1	E3	E3	E3	E3	P.T
	E3	E3	E3	E3	+0
●SEL <>	•M 58	UTE (ID	•DI 1/	U 1

Time Division [DIV] set to 1/1

PATTERN SCREEN additional settings

There are a few general settings and options in the PATTERN SCREEN.

Click the **RIGHT SCREEN ENCODER (PLAY MODE)** to toggle between the parameters on the right side of the *PATTERN SCREEN* and turn the encoder to change the values.

[SEQ] turns the SEQUENCER "ON" and "OF" regardless of the **PLAY** key status. This is covered in the first instructions section <u>Running the SEQUENCER</u>.

[FLW] determines if the *PATTERN SCREEN* follows the currently playing PATTERN when several PATTERNS are chained in QUEUE and played back. The default value "OFF" keeps the *PATTERN SCREEN* on the PATTERN selected, regardless of the currently playing PATTERN. Setting [FLW] to "ON" will always display the PATTERN currently playing in the QUE. For more information about PATTERN chaining in QUEUES refer to



the <u>OUEUE SCREEN chaining PATTERNS</u> and <u>OUEUES</u> sections. The currently playing PATTERN is indicated by a loudspeaker icon on the right side of the PATTERN number in the top part of the screen.



[FLW] set to "ON" - the PATTERN SCREEN follows the currently playing PATTERN

[P.T] Pattern transpose allows to transpose whole PATTERN in semitones without changing the [NOTE] values of all steps. The transposition limits are one octave down and one octave below the [NOTE] values. In the example below [P.T] is set to +2 which means all notes are played 2 semitones higher.

PTRNS	Þ	PATTE	RN 1	0	SEO
PAT	E3	E3	E3	E3	
	E3	E3	E3	E3	DN
1	E3	E3	E3	E3	P.T (
	E3	E3	E3	E3	+2
•NOTE VEL	G	ATE LIDE	MICRO Ratch	1 PI 1 5	ROB T REP

Pattern transpose [P.T] set to +2 semitones

The left side of the *PATTERN SCREEN* gives control over the currently displayed PATTERN. [PAT] indicated the PATTERN number. Use the **</> arrow** buttons to switch between 8 available PATTERNS. Changing the displayed PATTERN does not change the currently played PATTERN. For more information on how to change the currently playing PATTERN refer to the <u>OUEUE SCREEN</u> chaining PATTERNS and <u>OUEUES</u> sections.

QUEUE SCREEN overview

To access the QUEUE SCREEN access the main <u>PATTERN SCREEN</u> and then press the **LEFT SCREEN ENCODER (PRESETS)** (PTRNS).

The *QUEUE SCREEN* gives you access to all 8 PATTERNS, copy/paste functionality, control over PATTERN chaining in QUEUES, changing QUEUES and saving 4 different QUEUES. This section provides an overview of the information provided in the *QUEUE SCREEN* and the next section provides detailed instructions for PATTERN and QUEUE CHAINING.

SEL/E	DIT	R:	01:08 5>C>1) A C	0PY (
O 841>	OR41>2 OB 1>1 OE 1>1 OD 1>1								
PT+0	1+	2	з	4					
1/8	5	Ь	٦	8					
1> 2> 3> 4>									
				UE					

QUEUE SCREEN

There is a maximum of 8 PATTERNS per PROJECT (PATTERNS 1 - 8) and a sequence or chain of patterns are called QUEUES. There are 4 QUEUE slots (QUEUES A, B, C, D) and the QUEUES themselves can also be chained.

The top line of the screen features the play status and play cursor readout in the center. The play status is indicated by the play and pause symbols. The play cursor readout follows the formula: [QUEUE] : [PATTERN] : [PATTERN STEP]. The example above "A:01:01" is read as "QUEUE A, PATTERN 1, STEP 1"

The second line of the screen displays the current QUEUE chain. For example, "A>B>B>C>A>D"

► SELVEDIT ► B:01:04 (A) COPV 4 ● R> B> B> C> R> D>									
OR	1>1	Ο	841>1	OE	1>1	OD	1>1		
PT+	o) '	1+	2	3	4				
1/8		5	Ь	٦	:				
1>									
	• REC QUEUE								

QUEUE CHAIN A>B>B>C>A>D

The third line of the screen provides a selection between the 4 QUEUE tabs as well as indicating the first two PATTERNS of each QUEUE. In this screen you can press the **PITCH ENCODERS** 1 - 4 to select QUES A, B, C and D accordingly and the the currently selected QUEUE will be indicated by a highlighted background. The loudspeaker symbol next to the QUEUE letter indicates the currently playing QUEUE.

Lines four and five allow you to select and chain PATTERNS 1 - 8 using the 8 corresponding **KEYPAD KEYS**. The selected PATTERN is indicated by a dotted line and the currently playing PATTERN is indicated by a highlighted background.

Below you can see the active PATTERN chain of the selected QUEUE. In the example above "1>1>2>1>3>4"

SEL/E	DIT	R:	A)BOS A)	ĺ	a) C	OPY 🕻
O R4 1>	1 08	5 1>1	OD	1>1	OD	1>1
PT+0	1	2	з	4	NEW	PAT
1/8	5	Ь	٦	B	PAT	CH
			1>			
	10	> 1> a	> 1> 1	3> 4>		

PATTERN CHAIN 1>1>2>1>3>4

The bottom line displays the text "REC QUEUE", which is a placeholder for recording a new PATTERN chain for the QUEUE slot. The newly recorded PATTERN chain replaces the currently active PATTERN chain, once it begins playing back.

QUEUE SCREEN managing PATTERNS

The QUEUE SCREEN can be used to navigate between different PATTERNS and to copy/paste PATTERNS.

Use the eight **KEYPAD KEYS** to select a corresponding PATTERN 1 - 8 for editing. The selected PATTERN is indicated by a dotted line. To enter the *PATTERN SCREEN* for the selected PATTERN press the **LEFT SCREEN ENCODER (PRESETS)** indicated by "SEL/EDIT" on the top left corner of the screen.

To copy/paste PATTERNS first select the source PATTERN to be copied by pressing a **KEY 1 - 8** corresponding to the PATTERNS 1 - 8. Press the **RIGHT SCREEN ENCODER (PLAY MODE)** to copy the selected PATTERN indicated by "COPY" on the top right corner of the screen. Now select a target PATTERN to paste to and press the **RIGHT SCREEN ENCODER (PLAY MODE)** again indicated by the "PASTE" label.

QUEUE SCREEN chaining PATTERNS

The *QUE SCREEN* is designed for launching different PATTERNS one by one, as well as for preparing and launching chains (QUEUES) of up to 12 PATTERNS.

There are 3 modes of selecting and launching a PATTERN or a QUEUE of several PATTERNS:

Hold **REC + KEYPAD** = enter a PATTERN or a QUEUE of PATTERNS and play after the currently playing PATTERN.

Hold **REC + ALT + KEYPAD** = enter a PATTERN or a QUEUE of PATTERNS and play after the currently playing QUEUE.

Hold **REC + CLUTCH (TAP) + KEYPAD** = enter a PATTERN or a QUEUE of PATTERNS and play at the next beat (instant switch).

While selecting a new PATTERN or a QUEUE of PATTERNS the corresponding PATTERN numbers appear instead of the "O REC QUEUE" label and the **O** symbol starts blinking. As soon as the **REC** key is released the newly selected PATTERNS are placed into the QUEUE. The start of the newly selected PATTERNS is determined by the choice of the above key combinations.

In the examples below the SEQUENCER is playing a single PATTERN 1. Then a new chain of PATTERNS "1>1>2>1>3>4" is recorded and finally the recorded PATTERN chain starts playing back, as soon as the previous PATTERN has ended.



PATTERN 1 playing

SEL/EI	DIT	R:C	ABUE A>	0	a) C	OP4 (
O R4 1>1	OB	1>1	OD	1>1	OD	1>1
PT+0	1	2	3	4	NEW	PAT
1/8	5	Ь	٦	B	PATI	CH
	1>	1> a	1> > 1> :	3> 4>		

PATTERN CHAIN 1>1>2>1>3>4 recorded and queued

SEL/E	DIT	R:0	1808 A>	Œ	a) C	OP4 🕻		
O 84 1>	1 08	3 1>1	OD	1>1	OD	1>1		
PT+0	1	2	з	4				
1/8	5	Ь	٦	B				
■ 1> 2> 1> 3> 4> ■ REC QUEUE								

Recorded PATTERN CHAIN playing

Now this newly created chain of PATTERNS will be continuously playing in a loop in QUEUE A.

It is possible to change the mode of PATTERN selection during the process as long as the **REC** key is held pressed down. If a new chain of PATTERNS is entered, and the **REC** key is still held pressed down, pushing the **ALT** or **CLUTCH (TAP)** keys will change when the selected PATTERNS will be played according to the 3 modes above.

Resetting the SEQUENCER with **ALT + PLAY** ends the currently playing PATTERN and QUEUE and starts playback of the new QUEUE.

QUEUE SCREEN chaining QUEUES

As can be seen in the previous example, the recorded PATTERN chain is saved in the active QUEUE slot. There are four slots: QUEUES A, B, C and D. While the active PATTERN chain is playing you can access other QUEUES by pushing **PITCH ENCODERS 1, 2, 3, 4** corresponding to QUEUES A, B, C, D. Selecting and viewing a QUEUE does not start playing the QUEUE.

QUEUES are selected and played similarly to PATTERNS. Up to 12 QUEUES can be chained.

Hold **REC + PITCH ENCODERS** = enter a QUEUE or a chain of QUEUES and play after the currently playing PATTERN.

Hold **REC + ALT + PITCH ENCODERS** = enter a QUEUE or a chain of QUEUES and play after the currently playing QUEUE.

Hold **REC + CLUTCH (TAP) + PITCH ENCODERS** = enter a QUEUE or a chain of QUEUES and play at the next beat (instant switch).

► SEL/EDIT ► R:01:01 R E0RY 4 • R> R> B> C> R> D>						
O R4 1>1	OB	1>1	OE	1>1	OD	1>1
PT+O	1	2	З	4		
1/8	5	Ь	٦	:		
1>						
	REC QUEUE					

QUEUE CHAIN A>A>B>C>A>D recorded

Currently active PATTERN chains in each QUEUE and the QUEUE chains are saved in a PROJECT.

QUEUE SCREEN momentary performance tools

The QUE SCREEN offers a few performance tools for momentarily transposing the SEQUENCER and for momentarily looping the current PATTERN STEP. These momentary actions are performed by holding **ALT** and pushing the **PITCH ENCODERS.** During these actions the QUEUE SLOTS are replaced by the momentary action parameters.

▶ SELVEDIT > B:01:15 (R) CORV 4 ● R> R> C> R> D>					
SENT BO SINT BO E+ STO 5- ITO					
PT+D	1	2	З	4	(MOM)
1/8	5	Ь	٦	8	PLRY
1>					
REC QUEUE					

Holding ALT in the QUEUE SCREEN

Hold **ALT** and push the **PITCH ENCODER 1 or 2** to transpose the SEQUENCER. Hold **ALT** and turn the **PITCH ENCODER 1 and 2** to set the transposition interval for each encoder individually between -12 and +12 semitones.

This way you can prepare two momentary pitch shift intervals and use them in a performance.

Hold **ALT** and push the **PITCH ENCODER 3 or 4** to continuously loop the current PATTERN STEP. Hold **ALT** and turn the **PITCH ENCODER 3 and 4** to set the looping subdivision for each encoder individually between 1/8 and 1/32.

MOTION REC

Description

MOTION RECORD is a performance tool that allows you to record and loop manual adjustments of almost any parameter on MOTOR Synth's front panel and its various screens. Furthermore, MOTION RECORD can also record polyphonic performances on the **KEYPAD.**

There are eight MOTION RECORD LANES available and each lane can be assigned to a single parameter. Additionally - each MOTION REC Lane can have a variable length. All recorded motion lanes can be individually edited post-recording - this includes changing playback speed and playback direction as well as applying individual LANE mutes.

The recording and playback of motion lanes can be made independent of the MASTER TEMPO or it can be synchronized with it. Finally, the MOTION RECORD LANE'S can be synchronized with the <u>SEOUENCER</u>.

List of parameters

The record and playback functions are controlled with the **PLAY / STOP** and **REC** keys. All MOTION RECORD LANES are controlled from the *MOTION REC SCREEN*.

Enter the *MOTION REC SCREEN* by pressing the **PLAY MODE** encoder, then turning the encoder to highlight "MOTION REC" and then pressing the encoder again to select "MOTION REC".

PLRY	MODE
CROSS MOD SET	RBP
DETUNE SET	580
IN ENV FOLLOW	MOTION REC 🕃
ROUTE SET	
CV/TRIG SET	
MIDI ASSIGN	

PLAY MODE > MOTION REC

This list contains an overview of all parameters in this section. For further information refer to the Instructions sub-section below.

Parameter	Control	Description	Value Range
Play status	PLAY / STOP key	The playback status of all LANES	Play; Stop
Record status	REC key	The record state	Not recording; Armed; Recording

[SPEED]	RIGHT SCREEN ENCODER (PLAY MODE)	The playback speed for an individual LANE	"1X", "2X", "3X", "4X"
Direction [DIR]	RIGHT SCREEN ENCODER (PLAY MODE)	The playback direction of an individual LANE	">" Forwards; "<" Backwards; "<>" Ping Pong
[MUTE]	RIGHT SCREEN ENCODER (PLAY MODE)	The mute status of an individual LANE	Not muted; Muted
[SYNC ON REC]	RIGHT SCREEN ENCODER (PLAY MODE)	The recording synchronization	"FREE" free running, not synced; "BPM" synced to BPM; "PAT" synched to the currently playing SEQUENCER PATTERN

Instructions

Recording and deleting MOTION RECORD LANES

The MOTION RECORD engine is always ready to start recording parameter changes, and can be quickly armed and engaged by the **REC** key. However, opening the dedicated *MOTION REC SCREEN* can be useful for monitoring the recording process.

Enter the *MOTION REC SCREEN* by pressing the **PLAY MODE** encoder, then turning the encoder to highlight "MOTION REC" and then pressing the encoder again to select "MOTION REC".

* CROSS MOD SET RRP DETUME SET SED IN ENV FOLLOW MOTION REC * ROUTE SET CUPTRIG SET CUPTRIG SET MOTION REC * PLAY MODE > MOTION REC DIR * DEMPTY COMOTION REC * * DEMPTY COMOTION REC * * EMPTY COMOTION REC *
DETUME SET SED IN ENV FOLLOW ROUTE SET CW/TRIG SET MIDI RSSIGN PLAY MODE > MOTION REC PLAY MODE > MOTION REC DIR EMPTY 2: EMPTY 3: EMPTY
IN ENV FOLLOW ROUTE SET CV/TRIG SET MIDI RSSIGN PLAY MODE > MOTION REC PLAY MODE > MOTION REC DIR EMPTY 3: EMPTY
ROUTE SET CY/TRIG SET MIDI ASSIGN PLAY MODE > MOTION REC PLAY MODE > MOTION REC DIR EMPTY C: EMPTY C: EMPTY
PLAY MODE > MOTION REC DIR DIR EMPTY EMPTY EMPTY EMPTY
PLAY MODE > MOTION REC DIR
PLAY MODE > MOTION REC O MOTION REC > DIR E EMPTY E EMPTY E EMPTY
PLAY MODE > MOTION REC O MOTION REC > DIR E EMPTY E EMPTY E EMPTY
DIR DIR DIR DIR DIR DIR DIR DIR
0 MOTION REC > DIR >1: EMPTY 2: EMPTY 3: EMPTY
U O MOTION REE > DIR > 1: EMPTY 2: EMPTY 3: EMPTY
• <u>1: EMPTY</u> 2: EMPTY 3: EMPTY
2: EMPTY 3: EMPTY
2: EMPTY
З: Емртч
3: EMPTY
и. смати

There are two ways of recording parameter changes.

Instantaneous recording:

First choose a parameter to be recorded, for example the FILTER **CUTOFF FREQ** knob, then press and hold down the **REC** key and start adjusting the desired parameter. A MOTION REC LANE will be created as soon as the **REC** is pressed and held down and it will keep recording until the **REC** key is released, or for as long as the internal memory allows.

Note: Each new recorded parameter takes up one LANE and during a recording only one LANE can be recorded. To record several parameter movement lanes, you need to record them onto separate LANES one by one.

Armed recording:

The second way of creating MOTION REC LANES is to use the ARM function. Press **ALT + REC** to arm the MOTION RECORD engine. The **REC** key is lit up red and the MOTION RECORD will remain armed until any parameter is adjusted. The recording begins as soon as any parameter change is detected. The **REC** key will instantly light up white indicating that a new LANE has been created and that the recording is in progress. To stop the recording press **REC**, which will complete the recording process and start playback of the newly created LANE.

In the example below **CROSS MOD** knob changes are recorded onto LANE 1. The bar represents the length of recording.

	MOTION	REC >	SP	EEDK
1: CR055	MOD	FREE	18	×
2: EMPTY	ł			
3: EMPT	ł			•••••
4: EMPT	ł			•••••
1				

CROSS MOD movement recorded onto LANE 1

Press the **PLAY / STOP** key to start and stop the playback of all MOTION RECORD LANES.

	MOTION	REC >	5P	EED 4
1: VCF FC V	11	FREE	18	> •
2: DRIFTIDE	TUNE	FREE	18	> • •
3: KEY 8		FREE	18	> •
4: EMPTY				
1				

Three LANES recorded. LANE 2 selected

To navigate between the LANES turn either the **CTRL** encoder or the **LEFT SCREEN ENCODER (PRESETS).** The selected LANE is indicated by the highlighted parameter name. To delete the selected LANE press the **DEL** button.

To delete all LANES press ALT + DEL and then the RIGHT SCREEN ENCODER (PLAY MODE) to confirm.

Press the **CTRL** encoder to mute the currently selected MOTION RECORD LANE.

Recording synchronization

Each MOTION RECORD LANE can either be recorded freely (off the tempo grid), or synchronized to the master BPM or to the length of currently playing <u>SEQUENCER</u> PATTERN. The selection of synchronization needs to be made before a LANE is recorded.

Enter the *MOTION RECORD SCREEN* and press the **> arrow** button to open the *MOTION REC SETT SCREEN*. Use the **RIGHT SCREEN ENCODER (PLAY MODE)** to set the [SYNC ON REC] value.



MOTION REC SETT SCREEN

"FREE" is a free running (not synchronized) recording.

"BPM" is a synchronized recording that snaps to quarter note subdivisions of the <u>MASTER TEMPO</u>. "PAT" synchronizes the recording to the currently playing SEQUENCER PATTERN. The recording length is synchronized to PATTERN length and motion recorded events are quantized to PATTERN steps. If another PATTERN is being played, the recorded LANE will not be played. If the same parameter is also recorded for another PATTERN, each portion of the LANE will be played during the corresponding PATTERN.

Note: The "PAT" mode requires the <u>SEQUENCER</u> to be running.
Tip: It is possible to have different synchronization settings for each LANE, thus enabling synchronized and free-running parameter movements at the same time. In the example below all three synchronization options are used.

O MOTION	REC >	5F	EED
1: VEF FE VI	FREE	18	> •
2: CROSS MOD	FREE	48	> •
3: V1 SCALE	врм	5%	> •
4: KEY EVENTS	PAT	18	> 1

DIFFERENT LANE SYNC SETTINGS

Changing LANE playback parameters

Each LANE can be modified during playback. To navigate between the LANES turn either the **CTRL** encoder or the **LEFT SCREEN ENCODER (PRESETS).** The selected LANE is indicated by the parameter name being highlighted.

Push the **RIGHT SCREEN ENCODER (PLAY MODE)** repeatedly to toggle between [SPEED], Direction [DIR] and [MUTE] parameters for the selected LANE and turn the encoder to change the parameter values.

[SPEED] determines the playback speed of the selected LANE. "1X" is the recorded speed. A maximum of 4 times faster "4X" playback speed is possible.

Direction [DIR] determines the playback direction of the selected LANE. ">" Forwards, "<" Backwards and "<>" Ping Pong playback is possible.

[MUTE] allows to mute the selected LANE. Alternatively, press the PRESETS Enoder to MUTE a highlighted LANE.

RANDOM GENERATOR

Description

The RANDOM GENERATOR function allows to randomize sound parameter values resulting in unique sounds. Customizing the amount of randomization allows to control the possible scope of changes. This can be used for all sound parameters at once or parameters of individual screens. Furthermore, the RANDOM GENERATOR can be used to generate random <u>SEQUENCES</u> and <u>ARPEGGIATOR RHYTHM</u> patterns.

Using the RANDOM GENERATOR can be useful for exploring strange parameter combinations, generating ideas for new presets and introducing slight random changes to existing presets. Because of its nature the RANDOM GENERATOR can produce strange and even broken patches with conflicting parameter values. However, the customization options allow to limit the parameters to be randomized and randomization amount, which can help retain the core patch while introducing subtle random changes.

The RANDOM GENERATION customization setup is saved with <u>PRESETS</u> so it can be saved and recalled during a performance.

List of parameters

The RANDOM GENERATOR is accessed by pressing **ALT + LATCH / RNDM**. The functionality is dependent on the currently active screen when the button combination is pressed.

To access the sound parameter randomization settings and randomize all parameters at once press **ALT + LATCH / RNDM** from the *MAIN PLAY SCREEN*.

To randomize a specific group of parameters press **ALT + LATCH / RNDM** from the corresponding screen. For example *V1 AMP ENV SCREEN* to randomize VOICE 1 AMP ENVELOPE parameters.

To randomize SEQUENCER PATTERN step parameters press **ALT + LATCH / RNDM** from any of the SEQUENCER screens.

When randomizing all sound parameters or SEQUENCER PATTERN step parameters it is possible to change the randomization settings according to the following parameters.

Sound parameter RANDOMIZE SCREEN

Parameter	Control	Description	Value Range
[VOICES]	LEFT SCREEN ENCODER (PRESETS)	VOICES to be randomized	"OFF" - VOICE parameters are not randomized; "ALL"; "V1"; "V2";

[WAVE]	LEFT SCREEN ENCODER (PRESETS)	Waveform randomization amount	"OFF" 25%, 50%, 75%, 100%
[ENV]	LEFT SCREEN ENCODER (PRESETS)	AMP ENVELOPE randomization amount	"OFF"; 25%, 50%, 75%, 100%
[ACCEL]	LEFT SCREEN ENCODER (PRESETS)	ACCELERATION & BRAKE randomization amount	"OFF"; 25%, 50%, 75%, 100%
[VCF]	LEFT SCREEN ENCODER (PRESETS)	FILTER randomization amount	"OFF"; 25%, 50%, 75%, 100%
[DRIVE]	LEFT SCREEN ENCODER (PRESETS)	DRIVE randomization amount	"OFF"; 25%, 50%, 75%, 100%
[CROSS]	RIGHT SCREEN ENCODER (PLAY MODE)	CROSS MOD randomization amount	"OFF"; 25%, 50%, 75%, 100%
[NOTES]	RIGHT SCREEN ENCODER (PLAY MODE)	KEYPAD note randomization octave range	"OFF"; From 1 to 4
[DETUNE]	RIGHT SCREEN ENCODER (PLAY MODE)	VOICE DETUNE randomization amount	"OFF"; 25%, 50%, 75%, 100%
[POLY]	RIGHT SCREEN ENCODER (PLAY MODE)	POLY SETUP randomization status	"OFF"; "ON"
[MOD1]	RIGHT SCREEN ENCODER (PLAY MODE)	MOD 1 randomization amount	"OFF"; 25%, 50%, 75%, 100%
[MOD2]	RIGHT SCREEN ENCODER (PLAY MODE)	MOD 2 randomization amount	"OFF"; 25%, 50%, 75%, 100%
[MOD3]	RIGHT SCREEN ENCODER (PLAY MODE)	MOD 3 randomization amount	"OFF"; 25%, 50%, 75%, 100%
[ARP]	RIGHT SCREEN	ARPEGGIATOR	"OFF";

ENCODER (PLAY MODE)	parameter randomization amount	25%, 50%, 75%, 100%
------------------------	-----------------------------------	---------------------

SEQUENCER PATTERN step parameter RANDOMIZE SCREEN

Parameter	Control	Description	Value Range
[APPLY]	LEFT SCREEN ENCODER (PRESETS)	PATTERN steps to be randomized	"SEL ONLY" - selected steps only; "WHLE PAT" - whole PATTERN
[OCT RANGE]	LEFT SCREEN ENCODER (PRESETS)	[NOTE] randomization octave range	"OFF"; From 1 to 5
[BASE OCT]	LEFT SCREEN ENCODER (PRESETS)	[NOTE] randomization base octave	From 0 to 5
[NTE STEP]	LEFT SCREEN ENCODER (PRESETS)	[NOTE] randomization quantization	"MICRO" - microtonal, no quantization; "CHROM" - quantized to the chromatic scale; "SCALE"- quantized to the selected [SCALE]
[VEL]	LEFT SCREEN ENCODER (PRESETS)	Velocity [VEL] randomization amount	"OFF"; 25%, 50%, 75%, 100%
[GATE L]	LEFT SCREEN ENCODER (PRESETS)	Gate Length [GATE L] randomization amount	"OFF"; 25%, 50%, 75%, 100%
[MUTE]	RIGHT SCREEN ENCODER (PLAY MODE)	Percentage of steps to randomly muted	"OFF"; 25%, 50%, 75%, 100%
[GLIDE]	RIGHT SCREEN ENCODER (PLAY MODE)	[GLIDE] randomization amount	"OFF"; 25%, 50%, 75%, 100%

[MICRO]	RIGHT SCREEN ENCODER (PLAY MODE)	Microtiming [MICRO] randomization amount	"OFF"; 25%, 50%, 75%, 100%
[RATCH]	RIGHT SCREEN ENCODER (PLAY MODE)	Ratchet [RATCH] randomization amount	"OFF"; 25%, 50%, 75%, 100%
[PROB]	RIGHT SCREEN ENCODER (PLAY MODE)	Step Probability [PROB] randomization amount	"OFF"; 25%, 50%, 75%, 100%
[ST REP]	RIGHT SCREEN ENCODER (PLAY MODE)	Step Repeat [ST REP] randomization amount	"OFF"; 25%, 50%, 75%, 100%

Instructions

The RANDOM GENERATOR is accessed by pressing **ALT + LATCH / RNDM**. The functionality is dependent on the currently active screen when the button combination is pressed.

Randomize all sound parameters and customize the randomization amount

To randomize all MOTOR Synth's current sound parameters press the **EXIT (POLY MODE)** button to return to the *MAIN PLAY SCREEN* and then press **ALT + LATCH / RNDM** to enter the *RANDOMIZE SCREEN*.

ALT+RAND	TU RAN	DOMIZE	
VOICES	ALL	NOTES	OFF
MRVE	50%	DETUNE	OFF
ENV	757.	POLY	OFF
RCCEL	OFF	M001	50%
ŶCF	50%	MODZ	50%
DRIVE	OFF	MOD3	50%
CROSS	OFF	RRP	50%

RANDOMIZE SCREEN

The *RANDOMIZE SCREEN* displays a variety of different parameter groups that can be randomized with randomization amount settings. All parameter groups are listed in the <u>List of Parameters</u> section.

Push the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE)** to toggle between the parameter groups and turn the encoders to set the randomization amount for each. In the example



below only V1 parameters will be randomized and various parameter groups have different randomization amounts and some are turned off.

ALT+RAND	TU RAN	DOMIZE	
VOICES	Ψl	NOTES	OFF
WRVE	50%	DETUNE	OFF
ENV	757.	POLY	OFF
RCCEL	OFF	M001	257.
<u> VCF</u>	50%	M002	257).
DRIVE	OFF	MOD3	OFF
CROSS	257.	RRP	257.

RANDOMIZE settings for VOICE 1

While the *RANDOMIZE SCREEN* is open, pressing **ALT + LATCH / RNDM** the second time will generate random parameter values for all parameters according to the settings in the *RANDOMIZE SCREEN* thus generating a new patch.

Fip 1: The RANDOM GENERATOR can be used to introducing subtle changes to the existing sound instead of generating completely random sounds. Use the *RANDOMIZE SCREEN* to limit which parameter groups will be randomized and set the randomization amounts to the lowest possible 25%.

Randomize individual groups of sound parameters

To randomize only one specific group of parameters enter the dedicated screen for the desired parameters, for example, *V1 AMP ENV SCREEN*, and press **ALT + LATCH / RNDM**.

This will randomize the parameters only in the active screen. In the example below only VOICE 1 AMP ENVELOPE parameters are randomized. This is indicated by a temporary pop-up "RANDOMIZED!"



VI AMP ENV RANDOMIZED

Note: Randomizing within various screens still follows the RANDOM GENERATOR customization settings set in the *RANDOMIZE SCREEN*. If randomization for the given parameter group is set to "OFF" then parameters will not be randomized.

Randomize SEQUENCER PATTERN step parameters and customize the randomization amount

The <u>SEQUENCER</u> PATTERN steps have a dedicated RANDOM GENERATOR customization options. Enter the SEQUENCER and then press **ALT + LATCH / RNDM** to enter the *SEQ RANDOMIZE SCREEN* for the selected PATTERN.

SEO RAND	OMIZE	PRTTERN 1	
RPPLY SE	EL ONL	MUTE	257. 🕻
OCT RNG	2	GLIDE	OFF
BASE OCT	2	MICRO	OFF
NTE STEP	SCALE	RATCH	OFF
YEL	50%	PROB	OFF
GATE L	50%	ST REP	OFF
ALT+A	AND TO	RANDOMIZI	-!

SEQ RANDOMIZE SCREEN

Similarly to the sound parameter randomization the *SEQ RANDOMIZE SCREEN* displays a list of SEQUENCER PATTERN step parameters that can be randomized with randomization amount settings. All parameters are listed in the <u>List of Parameters</u> section.

Push the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE)** to toggle between the parameter groups and turn the encoders to set the randomization amount for each.

While the SEQ RANDOMIZE SCREEN is open, pressing **ALT + LATCH / RNDM** the second time will generate random step parameter values according to the settings in the SEQ RANDOMIZE SCREEN thus generating a PATTERN.

INPUT SIGNAL PROCESSING

Description

The MOTOR Synth features a 1/4 ' audio input jack on the back panel and the incoming audio signal can be used and routed in two ways:

- An INPUT envelope follower can gate or duck MOTOR Synth VOICES or a trigger signal can be extracted from the incoming audio for triggering the <u>SEQUENCER</u> and <u>ARPEGCIATOR</u>.
- The input signal can be mixed with the MOTOR Synth voices before (pre) and after (post) the FILTER.

F.	
	Note: The variable INPUT gain allows the use of audio signals of various amplitudes, including
	microphone level without requiring a separate preamp. This is useful for using the microphone INPUT for
i.	gating, ducking and triggering sounds.

List of parameter

To access INPUT signal processing press the **PLAY MODE** encoder and then use the **LEFT SCREEN ENCODER (PRESETS)** to choose either "IN ENV FOLLOW" for INPUT envelope follower or "ROUTE SET" for mixing the INPUT with MOTOR VOICES.

PLRY	MODE	
CROSS MOD SET		RRP 8
OLIONE SET	MOTION	REC
ROUTE SET		
MIDI ASSIGN		

PLAY MODE / IN ENV FOLLOW & ROUTE SET

IN ENV FOLLOW (envelope follower) and ROUTE SET (INPUT routing) each have a separate set of parameters and this section is organized accordingly.

The lists below contain an overview of all parameters in this section. For further information refer to the Instructions sub-section.

IN ENV FOLLOW parameters

Parameter	Control	Description	Value Range
VOICE 1 Status [V1]	LEFT SCREEN ENCODER (PRESETS)	INPUT envelope follower status for MOTOR VOICE 1	"ON" "OFF"

VOICE 2 Status [V2]	LEFT SCREEN ENCODER (PRESETS)	INPUT envelope follower status for MOTOR VOICE 2	"ON" "OFF"
ARPEGGIATOR Trigger Status [ARP]	LEFT SCREEN ENCODER (PRESETS)	INPUT trigger assignment to ARPEGGIATOR	"ON" "OFF"
SEQUENCER Trigger Status [SEQ]	LEFT SCREEN ENCODER (PRESETS)	INPUT trigger assignment to SEQUENCER	"ON" "OFF"
[MODE]	RIGHT SCREEN ENCODER (PLAY MODE)	INPUT toggle between GATE and DUCKING	"OFF" "DUCKING" "GATE"
Envelope Follower Mode [FOLLOW]	RIGHT SCREEN ENCODER (PLAY MODE)	INPUT envelope follower mode.	"ENV" output level is modulated in proportion to the INPUT level amplitude; "ONSET" - output level is modulated by [ATTACK] and [RELEASE] parameters triggered by INPUT transients
INPUT Threshold [THRES DB]	RIGHT SCREEN ENCODER (PLAY MODE)	The INPUT level threshold for GATE / DUCKING	From -60 dB to 0 dB
INPUT Gain boost or cut [GAIN DB]	RIGHT SCREEN ENCODER (PLAY MODE)	INPUT level boost or cut	From -20 dB to 60 dB
[ATTACK]	RIGHT SCREEN ENCODER (PLAY MODE)	Attack time for the INPUT trigger envelope	From 0.00 to 10.00 seconds
[RELEASE]	RIGHT SCREEN ENCODER (PLAY MODE)	Release time for the INPUT trigger envelope	From 0.00 to 10.00 seconds
INPUT Conditioning Bandpass Filter Cutoff [FC]	RIGHT SCREEN ENCODER (PLAY MODE)	Center frequency of the INPUT signal conditioning filter	From 0.0 to 10.0 octaves
INPUT Filter Bandwidth [BW]	RIGHT SCREEN ENCODER (PLAY MODE)	Bandwidth of the INPUT Signal conditioning filter	From 0 to 100 % of the frequency spectrum

ROUTE SET parameters

Parameter	Control	Description	Value Range
[INPUT ROUTE]	RIGHT SCREEN ENCODER (PLAY MODE)	INPUT signal routing	"MSTR" mix with MOTOR VOICES post-FILTER "VCF" mix with MOTOR VOICES pre-FILTER
Input Clean Volume [CLEAN VOL]	RIGHT SCREEN ENCODER (PLAY MODE)	The level of INPUT signal	From 0 to 100

Instructions

INPUT ENVELOPE FOLLOWER

The IN ENV FOLLOW section allows you to utilize the INPUT signal in several ways - to gate or duck the VOICES or to trigger the <u>SEQUENCER</u> or <u>ARPEGGIATOR</u>. Furthermore, it is possible to combine these applications.

To access the *IN ENV FOLLOW SCREEN* press the **PLAY MODE** encoder and then use the **LEFT SCREEN ENCODER (PRESETS)** to choose "IN ENV FOLLOW".

PLAY	MODE
CROSS MOD SET	RRP 8
OIN ENV FOLLOW	SEU MOTION REC
ROUTE SET	
CYTIKIG SET Midi Assign	

PLAY MODE / IN ENV FOLLOW

IN ENV FOLLOW							
NV1	DN		MODE	DUCKING			
45	ON		FOLLOW	ENV			
			THRES DE	3 -30			
			GAIN DB	0			
TRIE	051:		ATTACK	0.01			
RRP	OFF		RELEASE	0.50			
5E0.	OFF		FC	5.0			
			вм	100			

IN ENV FOLLOW SCREEN

The **RIGHT SCREEN ENCODER (PLAY MODE)** is used to toggle and change the gating and ducking parameters. The **LEFT SCREEN ENCODER (PRESETS)** is used to change the gating and ducking status for individual voices and to toggle <u>SEQUENCER</u> and <u>ARPEGGIATOR</u> triggering.

The [MODE] parameter can be set in one of three states: "OFF", "DUCKING" and "GATE".



In the "OFF" mode the INPUT signal does not affect the VOICES. In the "DUCKING" and "GATE" modes the VOICES can be ducked and gated respectively by the incoming audio signal. The effect is applied to a VOICE if the VOICE status is set to "ON" with the **LEFT SCREEN ENCODER (PRESETS).**

IN ENV FOLLOW							
141	OFF		MODE	GRTE			
45	OM		FOLLOW	ENV			
			THRES DB	-30			
			GRIN DB	I			
11315	051:		ATTACK	0.01			
882	OFF		RELERSE	0.50			
550	OFF		FC	5.0			
			вы	100			

[MODE] set to "GATE" and applied only to V2

Envelope Follower Mode [FOLLOW] determines how the INPUT signal's envelope affects GATE and DUCKING.

In the "ENV" mode the output volume is modulated in proportion to the amplitude of the INPUT signal, as long as it is above the [THRES DB] level. The INPUT signal's rising and/or falling slopes can be adjusted by the [ATTACK] and/or [RELEASE] parameters respectively.

The "ONSET" Envelope Follower Mode [FOLLOW] does not create a full envelope based on the input signal, but rather produces a trigger from each transient that crosses the [THRES DB] level and the following GATE and DUCKING effect is fully determined by the values set with the [ATTACK] and [RELEASE] time parameters.

[GAIN DB] amplifies or attenuates the INPUT signal. This allows using various INPUT signal levels including microphones on low volume sound sources, such as the human voice.

A conditioning band-pass filter can be applied to the INPUT signal to dial in a specific frequency band for GATING and DUCKING. The INPUT Conditioning Bandpass Filter Cutoff [FC] determines the center frequency for the filter and the INPUT Filter Bandwidth [BW] parameter determines the width of the filter band, expressed as a percentage of the Input signal's available frequency spectrum.

The [ARP] and [SEQ] parameters allow you to use the INPUT signal to trigger the <u>ARPEGGIATOR</u> and <u>SEQUENCER</u>, either separately or both together. When either of the parameters is set to "ON" the MOTOR Synth's clock and the current MASTER TEMPO is detached from triggering them. Instead, triggers are generated each time the INPUT signal crosses the [THRES DB] level. Each trigger advances the ARPEGGIATOR and/or SEQUENCER to the next step.

Note: GATE / DUCKING and TRIGGER functions are independent and can be enabled simultaneously, but the INPUT signal conditioning parameters such as [THRES DB], [GAIN DB], [FC] and [BW] are shared.

INPUT ROUTING

The MOTOR Synth offers to mix the INPUT signal together with the MOTOR VOICES pre- and post-<u>FILTER</u>. This is done independently from INPUT ENV FOLLOW.

To access INPUT routing press the **PLAY MODE** encoder and then use the **LEFT SCREEN ENCODER** (**PRESETS**) to choose "ROUTE SET"





ROUTE SETTINGS SCREEN

Both parameters in the *ROUTE SETTINGS SCREEN* are controlled with the **RIGHT SCREEN ENCODER (PLAY MODE).**

[INPUT ROUTE] selects whether the INPUT signal is mixed with MOTOR VOICES pre-FILTER "MSTR" or post-FILTER "VCF"

[CLEAN VOL] determines the level of INPUT signal sent to the output stage. This parameter does not affect the INPUT signal level for the GATE / DUCKING engines.
CV AND TRIGGER INPUTS

Description

The MOTOR Synth features 3 control voltage and 3 trigger inputs on the back panel. These are labeled CV1, CV2, CV3, TRIG1, TRIG2 and TRIG3. The CV inputs can be assigned to nearly any parameter on the MOTOR Synth and the TRIGGERS have several predefined destinations.

The CV input range is from -10V to +10V and all CV inputs can be individually attenuated and inverted. The TRIGGER inputs accept triggers and gates crossing 2.5V.

Instructions

CV and TRIGGERS are managed in the CV ASSIGN SCREEN and CV ATTENUATE SCREEN. Push **PLAY MODE** encoder and use the **LEFT SCREEN ENCODER (PRESETS)** to choose "CV/TRIG SET".

PLAY	MODE
CROSS MOD SET Detune set	ARP SEL
IN ENV FOLLOW Route Set	MOTION REC
©EV/TRIG SET MIDI ASSIGN	

PLAY MODE / CV/TRIG SET

Use the </ > arrow buttons to navigate between both screens.

ч рра	< CV ASS	IGN > RTTEN	CV RSSIGN < CV	ATTENUATE >	
CV/TRIG	MODE	DFF	CV1 1.0 I		1.3V
CV1 1.34	OFF	UNRSSIGNED #	UNRSSIGNED		
<u> TRIG1 0</u>	OFF		CY2 1.0 I		1.3V
CV2 1.34	OFF	UNRSSIGNED	UNRSSIGNED		
<u>trige o</u>	OFF		EV3 1.0 I		1.30
CV3 1.34 TRIG3 0	OFF OFF	UNRSSIGNED	UNASSIGNED		

CV ASSIGN SCREEN

CV ATTENUATE SCREEN

CV/TRIG MODES

There are several [CV/TRIG MODES] in the *CV ASSIGN SCREEN* that determine the CV and TRIGGER assignment. Turn the **LEFT SCREEN ENCODER (PRESETS)** to select one of the below:

"OFF"

CV and TRIG inputs are disabled even if there are parameters assigned

"PARAM"

CV1 - PARAM (assigned parameter modulation mode) CV2 - PARAM CV3 - PARAM TRIG1 - OFF TRIG2 - CLK RST (MASTER TEMPO reset) TRIG3 - CLK (MASTER TEMPO sync)

"IV/OCT ALL"

CV1 - IV/OCT ALL (pitch of all VOICES) CV2 - PARAM CV3 - PARAM TRIG1 - GATE ALL (gate of all VOICES) TRIG2 - CLK RST TRIG3 - CLK

"1V/OCT V1/2"

CVI - IV/OCT VI CV2 - IV/OCT V2 CV3 - PARAM TRIG1 - GATE V1 TRIG2 - GATE V2 TRIG3 - CLK

"TRIG ARP/SEQ"

CV1 - 1V/OCT ALL CV2 - PARAM CV3 - PARAM TRIG1 - GATE ALL TRIG2 - TRIG A/S (trigger ARPEGGIATOR and SEQUENCER simultaneously) TRIG3 - CLK (in this case only modulation and BPM detection is synced to external clock via TRIG3)

"TRIG ARP"

CVI - IV/OCT ALL CV2 - PARAM CV3 - PARAM TRIGI - GATE ALL TRIG2 - TRIG ARP TRIG3 - CLK (in this case only modulation and BPM detection is synced to external clock via TRIG3)

"TRIG SEQ"

CV1 - 1V/OCT ALL CV2 - PARAM CV3 - PARAM TRIG1 - GATE ALL TRIG2 - TRIG SEQ TRIG3 - CLK (in this case only modulation and BPM detection is synced to external clock via TRIG3)

CV assignment

If a CV slot is set to "PARAM" then it can be used to modulate any parameter it is assigned to.

To assign a parameter select a PARAM assign slot by turning the **RIGHT SCREEN ENCODER (PLAY MODE)**. Press the encoder to start the assignment process. Adjust any knob/switch on the MOTOR Synth's front panel or any parameter in all individual screens via the **SCREEN ENCODERS** to ASSIGN it as the destination. The last adjusted parameter will be assigned to the CV input.

The assignment needs to be confirmed. If the *CV ASSIGN SCREEN* wasn't exited during the assignment press **RIGHT SCREEN ENCODER (PLAY MODE).** If the screen was exited press **ALT + SYNC TEMPO** in the MODULATION SECTION.

The confirmed assigned parameter is displayed on the right from the CV slot.

ч рра	< CV ASS	IGN > RTTEN
CV/TRIG	MODE	PARAM
CV1 1.3¥ Trig1 0	PARAM Off	VCF FC
CV2 1.34 TRIG2 0	PARAM CLK RST	V2 DETUNE
CV3 1.34 TRIG3 0	PARAM Clk	V1 DECAY 8

CVI assigned to FILTER CUTOFF, CV2 assigned to V2 DETUNE, CV3 assigned to V1 DECAY

To cancel the assignment process at any time press **DEL.**

To clear the assignment for the selected CV slot press DEL.

CV attenuation

All 3 CV inputs can be attenuated and inverted in the CV ASSIGN SCREEN. Press the **> arrow** button to navigate to the CV ATTENUATE SCREEN and push the **LEFT SCREEN ENCODER (PRESETS)** to toggle between the CV slots and turn the encoder to attenuate and/or invert the incoming CV. The positive values attenuate the CV and the negative values attenuate and invert it.

CV	ATTENUATE >	•	
	_		1.3V
	-		1.3V
			1.3V
	C¥ 1 1	CV ATTENUATE >	CV ATTENUATE > I I I I

CV1 inverted and CV2 attenuated by 50%

MIDI ASSIGN

Description

The MIDI ASSIGN section gives control over MIDI mod wheel, channel pressure assignments as well as settings for MIDI velocity curve and pitchwheel depth.

For general MIDI settings see the <u>SETTINGS MENU / MIDI SCREEN</u> section.

Instructions

To access MIDI ASSIGN press the **PLAY MODE** encoder and then use the **LEFT SCREEN ENCODER** (**PRESETS**) to choose "MIDI ASSIGN"

PLAY	MODE	
CROSS MOD SET	AR	P ŧ
IN ENV FOLLOW	MOTION RE	Ľ
ROUTE SET CV/TRIG SET		
MIDI ASSIGN		

PLAY MODE / MIDI ASSIGN

Use the < / > arrow buttons to navigate between *MIDI ASSIGN* and *MIDI SET SCREENS*.

IIIII IIIIII IIIIII IIIIII IIIIII IIIIII	i ASSIGN > milli SE	MIDI RSSIGN < MIDI SET VEL CURVE LOG NOTE OUT KEYS
DEPTH DEPTH	.0 UNASSIGNED .0 UNASSIGNED	РІТСНИН МЯХ 2
CH PRESSURE: CH SENS V1 0	 .s unassigned	
CH SENS V2 CH SENS DCD D	.S UNRSSIGNED .S UNRSSIGNED	

MIDI ASSIGN SCREEN

MIDI SET SCREEN

MIDI mod wheel and channel pressure assignment

The *MIDI ASSIGN SCREEN* gives control over MIDI mod wheel and channel pressure assignments and individual depths for each assignment slot.

Turn the **RIGHT SCREEN ENCODER (PLAY MODE)** to scroll through three mod wheel assignment slots and three channel pressure assignment slots. In the example below the first mod wheel slot is highlighted.



Press the **RIGHT SCREEN ENCODER (PLAY MODE)** to start the assignment process for the selected slot. The "UNASSIGNED" text will change to "TURN KNOB" and pop-up will appear "TURN TO ASSIGN MODWHEEL SLOTI" which indicates that the mod wheel slot 1 is armed.

JRN TO ASSIGN	4 MO	DWHEEL SLOT 1
::::PIUUMHEEL		
DEPTH	1.0	TURN KNOB 🖲
DEPTH	1.0	UNRSSIGNED
DEPTH	1.0	UNASSIGNED
***CH PRESSUR	2000	
CH SENS VI	0.5	UNASSIGNED
CH SENS V2	0.5	UNASSIGNED
CH SENS DCO	0.5	UNASSIGNED

MIDI mod wheel slot 1 assignment

It is possible to turn any knob or encoder on the front panel or navigate to other screens and adjust any parameter with the **SCREEN ENCODERS** to assign it as the destination for the selected mod wheel slot.

For example, if the **TUNE VOICE 2** knob is now turned the [V2 DETUNE] parameter will be assigned to the armed modwheel slot. This is indicated by a new pop-up on the screen "MODWHEEL SLOT 1->V2 DETUNE"...

MODIWHEEL	SLOT	1 -> V2 DETUNE
::::MUVWHEE	L:::::	
DEPTH	1.0	V2 DETUNE 🖲
DEPTH	1.0	UNRSSIGNED
DEPTH	1.0	UNASSIGNED
CH PRESSU	8E*	
CH SENS VI	0.5	UNRSSIGNED
CH SENS V2	0.5	UNRSSIGNED

To confirm the assignment press **ALT + SYNC TEMPO** in the MODULATION section. Alternatively, if the *MIDI* ASSIGN SCREEN is still active, press the **RIGHT SCREEN ENCODER (PLAY MODE)** to confirm the assignment.

To cancel the assignment process press **DEL** at any time.

Any parameter in the MOTOR Synth that is assigned as an active mod wheel or channel pressure destination is indicated by the M and CP symbols respectively.



MODWHEEL ASSIGN



CHANEL PRESSURE ASSIGN

The *MIDI ASSIGN SCREEN* also allows to dial in the maximum mod wheel and channel pressure depth for each individual assignment slot.



Push the **LEFT SCREEN ENCODER (PRESETS)** to jump between the assignment slots and turn the encoder to set the maximum modulation depth from the parameter's actual value. Both positive and negative modulation is possible.

Г	NiDi AS	SIGN > III	iDi SE
:::::MODWHEE	L:::::		
DEPTH	-0.5	V2 DET	UNE 🗄
DEPTH	1.0	UNASSIG	NED
DEPTH	1.0	UNASSIG	NED
***CH PRESSU	8 2		
CH SENS V1	0.5	UNASSIG	NED
CH SENS V2	0.5	UNASSIG	NED

Mod wheel slot 1 DEPTH set to -0.5 which inverts and attenuates the mod wheel by 50%

Note: The <u>SETTINGS MENU / PARAMETER SETTINGS AND BRIGHTNESS SCREEN</u> allow for two specific behaviors of knobs and switches during the mod wheel and channel pressure assignment process which requires the user to turn the knob of the desired parameter. One of the optional behaviors freezes the parameter so that it is not changed during the assignment process. The other option is for the parameter to follow the knob movement also during the assignment process.

MIDI Velocity curve and pitch wheel

The MIDI SET SCREEN offers additional MIDI control settings.

Press the **LEFT SCREEN ENCODER (PRESETS)** to jump between Velocity Curve [VEL CURVE] and Pitch Wheel Depth [PITCHWH MIN / MAX] parameters. Turn the encoder to change parameter values.

[VEL CURVE] can be set to "FLAT" (no velocity), Linear "LIN", Logarithmic "LOG" and Squared "SQ". The [VEL CURVE] is visually represented in the lower part of the screen.



MIDI SET SCREEN

The [PITCHWH MIN / MAX] parameters set the minimum and maximum pitch modulation depth for MIDI pitch wheel in semitones. Intervals up to one octave up and down are possible.

Turn the **RIGHT SCREEN ENCODER (PLAY MODE)** to set the [NOTE OUT] parameter which determines what generates the MIDI note output: "KEYS" - MIDI notes generated by the **KEYPAD**, "SEQ" - MIDI notes generated by the <u>SEQUENCER</u>.

DELETE

Description

The **DEL** button allows you to reset parameters to the <u>INIT PRESET</u> or currently loaded <u>PRESET</u> values as well as perform additional actions in various screens.



Instructions

Reset parameters to PRESET values

To reset a single parameter to the currently loaded PRESET value, select the parameter within the corresponding screen and press the **DEL** button. This will change the parameter value to the one saved in the PRESET that was last loaded. This is indicated by a monetary pop-up message. To reset all sound parameters to the currently loaded PRESET value press **EXIT (POLY MODE)** to navigate to the *MAIN PLAY SCREEN* and press **DEL**.

In the example below V1 ACCELERATION [CURVE] is reset to the PRESET value from the V1 ACCEL SCREEN.

V1 RCCEL	CURVE CL	ERRED	TO PRESET
LUKVE			MUDER
0.0			TARGET
FROM			ACCEL 🗳
-5			OFF
5			BRAKE
-			OFF

VI ACCEL CURVE value reset to PRESET value

Reset parameters to INIT values

To reset parameters to the INIT values navigate to the desired screen and press **ALT + DEL**. This will show a prompt with a confirmation step. Use the **SCREEN ENCODERS** to confirm or cancel. If confirmed all

parameters within the given screen will be reset to INIT values. To reset all sound parameters to the INIT values press **EXIT (POLY MODE)** to navigate to the *MAIN PLAY SCREEN* and press **ALT + DEL.**

In the example below all FILTER parameters are cleared to INIT values from the FILTER SCREEN.



FILTER parameters reset to INIT values

To change the INIT parameter values refer to the <u>PRESETS AND PROJECTS / PRESET options</u> section.

Clear ARPEGGIATOR RHYTHM and SEQUENCER STEPS

<u>ARPEGGIATOR RHYTHM</u> and <u>SEQUENCER</u> uses CLEAR and RESET to clear all or individual STEPS to the default values.

To reset all STEPS to the default values press **ALT + DEL** regardless of the current STEP selection. This will show a prompt with a confirmation step. Use the **SCREEN ENCODERS** to confirm or cancel.



ARP RHYTHM all STEPS cleared to the default values

To reset the selected steps to the default values press **DEL.** This is indicated by a monetary pop-up message.



SEQUENCER selected STEPS cleared to the default values

Delete MOTION RECORD lanes

MOTION RECORD uses the **DEL** button to erase all or individual MOTION RECORD LANES.



To erase all MOTION RECORD LANES press **ALT + DEL** regardless of the current selection. This will show a prompt with a confirmation step. Use the **SCREEN ENCODERS** to confirm or cancel.

II O MOTION REC > SPEED 4	II O MOTION REC > SPEED 4
1: CROSS MOD FREE 1X > 4	1: EMPTY
······	1
MOTION RECORD	2: EMPLY
	3: EMPTY
22	
NO YES	4: EMPTY
	1

All MOTION REC LANES deleted

To erase a single MOTION RECORD LANE use the **CTRL** or **LEFT SCREEN ENCODER (PRESETS)** to select it and press **DEL** This is indicated by a monetary pop-up message.

SLOT 1 C	LEARED!	
NI: EMPTY		
2: VCF FC V1	FREE 1X	> •
3: V1 SCALE	BPM 1X	> •
4: DRIVE V1	PRT 1X	> •

Selected MOTION REC LANE deleted

PRESETS AND PROJECTS

Description

The MOTOR Synth PRESETS save and recall sound-related parameters, whereas PROJECTS save and recall sound parameters, SEQUENCES, routing and system settings. All PRESETS and PROJECTS are saved and recalled from the SD card. PRESETS are organized in BANKS. Up to 128 BANKS with 128 PRESETS each is possible. Both the BANKS and PRESETS can be switched via MIDI. The MOTOR Synth is shipped with sample PRESETS which can be edited, renamed, moved between BANKS or deleted.

PRESETS and PROJECTS are managed in the *BROWSE PRESETS SCREEN* accessible via the **PRESET** encoder from the *MAIN PLAY SCREEN*.



Instructions

PRESET and PROJECT comparison

PRESETS are intended for storing sound patches, but PROJECTS are intended for saving <u>SEQUENCES</u>, <u>TEMPO</u>, <u>INPUT</u> settings and all <u>MENU</u> settings. However, the PROJECTS also save all current sound parameters. So loading a PROJECT also loads all PRESET parameters in the background.

```
MOTOR - [M] - SYNTH
```

Function	PRESET	PROJECT
MASTER VOLUME		
MOTOR CONTROLS	v	~
ENVELOPES	v	v
ACCELERATION / BRAKE	v	~
FILTER	v	v
LINK	v	v
MODULATION	v	v
CROSS MOD	v	v
DRIFT & DETUNE		
KEYPAD SETUP	v	v
POLY SETUP	v	v
NOTES TO VOICES		v
MASTER TEMPO		v
ARPEGGIATOR	v	v
SEQUENCER		v
MOTION RECORD		v
RANDOM GENERATOR	v	v
IN ENV FOLLOWER		v
INPUT ROUTE		v
CV AND TRIGGER INPUTS		v
SETTINGS MENU		v
MIDI		v
MIDI ASSIGN	~	~

Browsing and loading PRESETS

Push the **PRESET** encoder whole in the MAIN PLAY SCREEN to access the BROWSE PRESETS SCREEN.

Use < / > arrow buttons to browse through BANKS. The selected BANK is indicated by a checkmark after the BANK number.



Turn the **PRESET** encoder to scroll through PRESETS within the selected BANK. The selected PRESET name is highlighted. Push the **PRESET** encoder to load the selected PRESET. The loaded PRESET is indicated by a checkbox in front of the PRESET number.

BROWSE	PRESETS
<*BANK 1: [./] DEM	0_2>
PC: PRESET (PRESS	'PRESET' TO LORD)
1: SPACE TOI ✓ 2: SUBBASS	
4: DOPPLERTUNN	EL
LORD	PTIONS/PROJECT

PRESET 2 loaded and PRESET 3 selected

If a note is being played during a PRESET change, the output will be temporarily muted while all sound parameters are loaded.

It is possible to ignore <u>KEYPAD SETUP</u>, <u>RANDOM GENERATOR SETTINGS</u> and <u>ARPEGGIATOR SETTINGS</u> when loading a PRESET. These PRESET Load preferences can be selected in the <u>SETTINGS MENU</u>.

Saving PRESETS

Any sound patch can be saved as a PRESET at any point. To save a PRESET enter the *BROWSE PRESET SCREEN* and push the **SAVE** button. The top line of the screen displays "SAVE PRESET TO:" and the screen highlights the next free PRESET slot in the selected BANK.



It is possible to select another BANK and PRESET slot, including overwriting a taken slot. Once the slot is chosen push the **SAVE** button or the **RIGHT SCREEN ENCODER (PLAY MODE)**. This opens the *PRESET NAME EDITING SCREEN*. The name is edited with keys and buttons indicated on the screen.



PRESET NAMING SCREEN indicates the letters on the KEYPAD



The **REC** key toggles the **KEYPAD** between letters, numbers and symbols. The **PLAY / STOP** key adds space, the **< / > arrow** buttons move the cursor, the **DEL** button erases symbols, the **TAP** key adds an underscore and the **ALT** key adds a dash.

Once the name is entered, push the SAVE button or the RIGHT SCREEN ENCODER (PLAY MODE).

If a taken PRESET slot is being overwritten a warning message is displayed. Press the **RIGHT SCREEN ENCODER (PLAY MODE)** to confirm. Or the PRESET saving process can be canceled any time by pressing the **PRESETS** encoder.



Overwrite warning

PRESET loading with MIDI

PRESETS can be recalled via MIDI messages. For general MIDI channel configuration, refer to <u>SETTINGS</u> <u>MENU / *MIDI SCREEN*</u> section.

To select a BANK use CC 0 and value 0-127 corresponding to the bank number. All further PC messages will recall PRESETS in the selected BANK.

To recall a PRESET within the selected BANK use PC messages 1-128 corresponding to the PRESET slot number.

PRESET options

To edit PRESET properties enter the *BROWSE PRESETS SCREEN*, turn the **PRESET** encoder to highlight the required PRESET and push the **RIGHT SCREEN ENCODER (PLAY MODE)** indicated by "OPTIONS/PROJECT".



PRESET OPTIONS SCREEN

The *PRESET OPTIONS SCREEN* allows you to edit multiple properties of the highlighted PRESET. Turn the **PRESETS** encoder to highlight a property option and push the encoder to select or edit.

[RENAME] opens the *PRESET NAME EDITING SCREEN*. For information on this screen, refer to the <u>Saving</u> <u>PRESETS</u> section.



RENAME PRESET

[MOVE] opens a *MOVE PRESET SCREEN*. Turn the **PRESETS** encoder to highlight Program Change [PC] or [BANK] parameter, press the encoder to select the parameter, turn the encoder to enter the desired [PC] or [BANK] number, and press the encoder once more to exit the parameter. Press the **RIGHT SCREEN ENCODER (PLAY MODE)** to ACCEPT the MOVE. If the selected PRESET slot is taken an warning message will be displayed with an extra confirmation step.



[DELETE] removes the PRESET from the slot. Selecting [DELETE] opens a warning message. Push the **RIGHT SCREEN ENCODER (PLAY MODE)** to confirm. To cancel push the **PRESETS** encoder.

	OPTIONS	
B1: PC2:	SUBBASS	
AFLIALJE		
	DELETE?	
£2	SUBBASS	
ND		YES

DELETE PRESET

[SET AS INIT] allows to set the highlighted PRESET as the initial (INIT) PRESET each time the MOTOR Synth is turned on. Selecting [SET AS INIT] opens a warning message. Push the **RIGHT SCREEN ENCODER (PLAY MODE)** to confirm. To cancel push the To cancel push the **PRESETS** encoder.

	OPTIONS	
B1: PC2:	SUBBASS	
NELINLIE	•	
	SET AS INI	Τ?
£2	B1:PC2 SUBBASS	
140		YES

SET AS INIT

[REMOVE INIT] allows to remove the initial (INIT) PRESET and restore the FACTORY INIT PRESET. Selecting [REMOVE INIT] opens a warning message. Push the **RIGHT SCREEN ENCODER (PLAY MODE)** to confirm. To cancel push the **PRESETS** encoder.

BANK renaming

To rename the selected BANK enter the *BROWSE PRESETS SCREEN* and push the **SAVE** button. Then push the **PRESETS** encoder indicated by "BANK RENAME" to rename the BANK.

SAVE PRESET TO:	
<*BANK 1: [/] DEMO_2>	
PC: PRESET	
20: E2 B2 C3	
21: DUO PUNCH TRIP	
<u>22: CLUB ATTAC</u> K	
23: < <empty>></empty>	
BANK RENAME	SAVE

BANK RENAME option during PRESET SAVING

The BANK NAME EDITING SCREEN functions the same as the PRESET NAME EDITING SCREEN. For information on this screen, refer to the <u>Saving PRESETS</u> section.

Browsing, saving and loading PROJECTS

PROJECTS are intended for saving SEQUENCES, MOTION RECORD, MASTER TEMPO, SETTINGS MENU and other aspects of the MOTOR Synth. Unlike PRESETS, the MOTOR Synth does not ship with sample PROJECTS.



To access PROJECTS enter the *BROWSE PRESETS SCREEN* by pushing the **PRESET** encoder. Push the **RIGHT SCREEN ENCODER (PLAY MODE)** indicated by "OPTIONS/PROJECT".

	OPTIONS		
B1: PC2: 5	UBBASS		
ORENAME	::	:PROJ	ECT:::
MOVE		LOAD	PROJ 🗄
DELETE		SAVE	PROJ
SET RS INI	Т		
REMOVE IN	IIT		
OK	BACK		OK
F	RESET OPTION	S	

Turn and push the **RIGHT SCREEN ENCODER (PLAY MODE)** to select between PROJECT Loading [LOAD PROJ] or PROJECT Saving [SAVE PROJ].

[SAVE PROJ] opens a list of PROJECTS. Turn the **PRESET** encoder to highlight a PROJECT slot and press the **RIGHT SCREEN ENCODER (PLAY MODE)** (SAVE) to save the PROJECT. If a taken PROJECT slot is being overwritten a warning message is displayed. Press the **RIGHT SCREEN ENCODER (PLAY MODE)** (SAVE) to confirm.



[LOAD PROJ] opens the list of PROJECTS.Turn the **PRESET** encoder to highlight a PROJECT and press the **RIGHT SCREEN ENCODER (PLAY MODE)** to load the PROJECT.

	LOAD PROJECT	
0: FIRS1 1: 59001	PROJECT No provect	
OPTIONS	BRCK LOAD PROJECT	LOAD

To access PROJECT property options, highlight a PROJECT and pusht the **PRESETS** encoder for OPTIONS. This opens the *PROJECT OPTIONS SCREEN* with [RENAME] and [DELETE] functions.

PROJECT OPTIONS FIRST PROJECT ©RENAME DELETE
UK BALK
PROJECT OPTIONS

The renaming and deletion process is the same as for PRESETS. Please refer to the <u>PRESET options</u> section for more information.

PRESETS and PROJECTS on the SD card

PRESETS and PROJECTS can be managed on a computer, by inserting the SD card in a card reader or by connecting the MOTOR Synth via USB cable and switching on USB MODE on the MOTOR Synth..

When connected via USB cable, power off the MOTOR Synth. Press and hold **CTRL + ALT + DEL** and power on the MOTOR Synth. This will enter the USB SD CARD MODE. Now it will be visible as a USB drive on your computer.

PRESETS and PROJECTS are stored in separate folders.

🥪 📔 🔽 🖡 🔻 🛛 MOTOR SYNTH (D:)	Manage			\Box \times
File Home Share View	Drive Tools			~ (2
	H (D:)	~	ē	
Name V		Туре		
PROJECTS		File folder		
PRESETS		File folder		
2 items				

PROJECTS and PRESETS folders

The PRESETS folder contains subfolders for all BANKS. Renaming a BANK subfolder will change the BANK name and CC 0 value. The subfolder name consists of the letter "B" followed by the CC 0 value "0-127" then followed by underscore and the BANK name. For example, the subfolder name "B1_DEMO_2" is displayed in the MOTOR Synth as "BANK 1: DEMO_2" and it is selected with CC 0 value 1.

I I I PRESETS File Home Share View				× ~ ?
← → ∽ ↑ 🖡 > MOTOR SYNTH (> PRESETS	~	₫	, o s	earch P
Name	Date modif	fied		Туре
B0_DEMO_1	26.04.2023	15:28		File fol
B1_DEMO_2	26.04.2023	15:28		File fol
<				>
2 items				

PRESETS folder contains BANK sub-folders

Each BANK subfolder contains PRESETS as MSPR files. Renaming the file will change the PRESET name and PC message number. The file name consists of the letter "P" followed by the PC message number "1-128" then followed by underscore and the PRESET name. For example, the file name "P1_SPACE TOI.mspr" is displayed in the MOTOR Synth as "1: SPACE TOI" and it is recalled with PC message 1.



The PROJECTS folder contains subfolders for all PROJECTS. Renaming a PROJECT subfolder will change the PROJECT name. The subfolder name consists of the letters "Pj" followed by the PROJECT number, then followed by an underscore and the PROJECT name. For example, the subfolder name "Pj0_FIRST PROJECT" is displayed in the MOTOR Synth as 0: FIRST PROJECT.

📕 🔽 📕 = 1	PROJECTS		—	
File Home	Share View			~ 🕐
← → * ↑	MOTOR SYNTH > PROJECTS	~	<u>م</u> ن	Search P
Name	^	Date modifie	d	Туре
Pj0_FIRST Pj1_SECOP	PROJECT ND PROJECT			File folc File folc
<				>
2 items				
	LOAD PROJECT			
-	D: FIRST PROJECT 1: Second Provent			
	PTIONS BACK	LOA	D	
PR	OJECTS on the SD card an	d MOTOR	Svnth	

Each PROJECT subfolder contains three files always with the same name:

"conf.msgp" - the SETTINGS MENU parameters

"preset.mspr" - the background PRESET of the PROJECT

"project.mspj" - SEQUENCES and MOTION RECORD

For a project to function properly, these files must remain with the same name.



PROJECT files on the SD card.

Firmware version 1.2 PRESET converter

The firmware version 1.2 was implemented with many major updates to the instrument. As a result all PRESETS created with older firmware versions need to be converted to work properly with the latest firmware.

The online PRESET management tool is available at: https://gamechangeraudio.com/motor-synth/preset-manager/



Online PRESET management tool

Choose the "MK I (V1.2+)" part of the tool.

Access your <u>PRESETS on a computer</u> and create a compressed .zip file of the whole PRESETS folder.

Drag and drop the compressed .zip file into the online PRESET management tool.

	MOTOR-	[M]— SY	NTH	
 Drag and drop pres Drag and drop band Preset and bank nu Click on a bank or p Uploaded legacy p with MS MK1 v1.2+ p 	ets to reorder them within a bank ks to change their order mbers will change automatically preset name to rename it resets (ones saved with MS MK1 fi prior to downloading	or to move them to anoth irmware version v1.2 or ear	ier bank rlier) are conv	rerted to be compatible
	Drag and drop your MS prese	ts (.zip or .mspr files) he	ere or	BROWSE
LOAD GCA PRESETS	1		CLEAR	CONVERT & DOWNLOAD

Drag and drop

MOTOR-(M)-SYNTH

The tool will display all BANKS and PRESETS.

Banks	[B1] DEM	10_2
[B0] DEMO_1	(19/128) 💐 [P1]	SPACE TOI
[B1] DEM0_2	(22/128) (22/128) 	SUBBASS
	₫ [P3]	ROBO DISCO
	(6/128) ≅€ [P4]	DOPPLERTUNNEL
□ [B3] <empty></empty>	(0/128) ∞\$ [P5]	SPACECRAFT
□ [B4] <empty></empty>	(0/128) ≊° [P6]	BASS 8STEP

All BANKS and PRESETS in the tool

It is now possible to rename both BANKS and PRESETS by clicking on the names and to rearrange them by clicking on the icons and dragging them.

Once all changes are done or if no changes were required, press the **CONVERT & DOWNLOAD** button. The converted PRESETS will be downloaded as a compressed .zip file. It contains the PRESETS folder which needs to be uncompressed and replace the old PRESETS folder on the SD card.

SETTINGS MENU

Description

The SETTINGS MENU holds access to the general settings of the MOTOR Synth. These settings are stored in <u>PROJECTS but not PRESETS</u>.

To access the SETTINGS MENU press **ALT + PRESETS / MENU**. Use the **< / > arrow** buttons to navigate left and right between various SETTINGS MENU sections. Push the **LEFT SCREEN ENCODER (PRESETS) & RIGHT SCREEN ENCODER (PLAY MODE)** to highlight various parameters and turn the encoders to change values.

Some of the SETTINGS MENU parameters are duplicates to parameters in other screens. These are indicated in the tables below.

SETTINGS MENU sections

INPUT ROUTING SCREEN



Parameter	Control	Description	Value Range
INPUT Routing [IN]	LEFT SCREEN ENCODER (PRESETS)	INPUT signal routing	"MSTR" mix with MOTOR VOICES post-FILTER "VCF" mix with MOTOR VOICES pre-FILTER

INPUT VOLUME SCREEN



Parameter	Control	Description	Value Range
INPUT Volume [VOL]	RIGHT SCREEN ENCODER (PLAY MODE)	The level of INPUT signal	From 0 to 100

STARTUP SCREEN

STARTUP	
MAR AR AR	
ା ଭିନ୍ଦିର ଭିନ୍ଦି ।	

Parameter	Control	Description	Value Range
Startup motor sound [STARTUP]	LEFT SCREEN ENCODER (PRESETS)	The acoustic sound of motors at startup	"ELECTRIC" "GAS" "DIESEL"

MIDI SCREEN

ніісі вкла	ΠT	V1 NOTE IN	CH1C
BR5E (1/0)	CH1	V2 NOTE IN	CH1
·····OUT FILTE	R	NOTES IN	ON
NOTES OUT	۵N		
RT OUT	ΠN	IN EN TER	
STRT/STP	۵N		1
CC OUT	٥N	RT IN	ON
NRPN OUT	FILT	CC/PC IN	ON
			10;

The *MIDI SCREEN* provides control over MIDI input and output parameters. For extended info on full MIDI implementation refer to the MIDI<u>IMPLEMENTATION</u> section.

Parameter	Control	Description	Value Range
[BASE (I/O)]	LEFT SCREEN ENCODER (PRESETS)	The main MIDI input/output channel.	CH1-16 "ALL" "OFF"

Parameter	Control	Description	Value Range
[NOTES OUT]	LEFT SCREEN ENCODER (PRESETS)	MIDI note output filter	"ON" "FILT"
[RT OUT]	LEFT SCREEN ENCODER (PRESETS)	MIDI clock output filter	"ON" "FILT"
[STRT/SP]	LEFT SCREEN ENCODER (PRESETS)	Start/Stop message output filter	"ON" "FILT"
[CC OUT]	LEFT SCREEN ENCODER (PRESETS)	Continuous controller output filter	"ON" "FILT"
[NRPN OUT]	LEFT SCREEN ENCODER (PRESETS)	MIDI NRPN output filter	"ON" "FILT"
[VI NOTE IN]	RIGHT SCREEN ENCODER (PLAY MODE)	MOTOR VOICE 1 MIDI note input channel that overrides the [BASE (I/O)]. Also available in the NOTES TO VOICES SCREEN	CH1-16 "ALL" "OFF"
[V2 NOTE IN]	RIGHT SCREEN ENCODER (PLAY MODE)	MOTOR VOICE 2 MIDI note input channel that overrides the [BASE (I/O)]. Also available in the NOTES TO VOICES SCREEN	CH1-16 "ALL" "OFF"
[NOTES IN]	RIGHT SCREEN ENCODER (PLAY MODE)	MIDI Note input filter	"ON" "FILT"
[RT IN]	RIGHT SCREEN ENCODER (PLAY MODE)	MIDI clock input filter	"ON" "FILT"
[CC/PC IN]	RIGHT SCREEN ENCODER (PLAY MODE)	Continuous controller and program change input filter	"ON" "FILT"

PARAMETER SETTINGS AND BRIGHTNESS SCREEN



The *PARAMETER SETTINGS AND BRIGHTNESS SCREEN* provides control over potentiometer and encoder settings, as well as strobe and KEYPAD and button brightness.

Parameter	Control	Description	Value Range
[POT MODE]	LEFT SCREEN ENCODER (PRESETS)	Determines how potentiometers function when the physical position does not match with the value loaded with a <u>PRESET</u>	"RELATIVE" - remaining value range of a given parameter is spread across the available physical range of the potentiometer - thus ensuring smooth knob behavior at all times; "JUMP" - a change of the physical position of a potentiometer immediately affects the parameter; "CATCH" - the parameter is affected only after the potentiometer crosses the parameter value.
[WHILE ASSIGN]	LEFT SCREEN ENCODER (PRESETS)	Determines if physical potentiometer and encoder adjustments affect parameters during the <u>MIDI ASSIGN</u> process	"CHANGE" - parameters are affected normally; "FREEZE" - parameters are not affected
[POPUP TIMEOUT]	LEFT SCREEN ENCODER (PRESETS)	Determines the time duration of pop-up messages.	From 1 to 10 seconds
[FILTER UNITS]	LEFT SCREEN ENCODER (PRESETS)	Determines the <u>FILTER</u> [CUTOFF] measurement units.	"CENTS" "Hz"

MOTOR SYNTH MKI USER MANUAL

Parameter	Control	Description	Value Range
[STROBE BRIGHT]	LEFT SCREEN ENCODER (PRESETS)	The brightness of the motor bay strobe	"FULL" "HALF" "DIM"
[BUTTON BRIGHT]	LEFT SCREEN ENCODER (PRESETS)	The brightness of keys and buttons	"FULL" "HALF" "DIM"

PRESETS SETTINGS SCREEN

SET::: 👭
ON UN
OFF
ON
DISABLED
FACTORY INIT

The *PRESETS SETTINGS SCREEN* provides control over <u>PRESET</u> loading settings as well as information about the selected INIT PRESET and currently loaded PRESET.

Parameter	Control	Description	Value Range
[KEYPAD (NOTES)]	LEFT SCREEN ENCODER (PRESETS)	Determines if the <u>KEYPAD</u> <u>SETUP</u> parameters of each PRESET are loaded	"ON" "OFF"
[RND SETTINGS]	LEFT SCREEN ENCODER (PRESETS)	Determines if the <u>RANDOM</u> <u>GENERATOR</u> parameters of each PRESET are loaded	"ON" "OFF"
[ARP SETTINGS]	LEFT SCREEN ENCODER (PRESETS)	Determines if the ARPEGGIATOR parameters of each PRESET are loaded	"ON" "OFF"

SERVICE SCREEN





The *SERVICE SCREEN* provides information about the <u>FIRMWARE</u> version, power supply status as well as access to the SERVICE MODE and option to reset the MOTOR Synth to the factory settings.

Parameter	Control	Description	Value Range
[SERVICE MODE]	LEFT SCREEN ENCODER (PRESETS)	Puts the MOTOR Synth in the SERVICE MODE	NA
[FACTORY RESET]	LEFT SCREEN ENCODER (PRESETS)	Resets the MOTOR Synth to factory settings. This does not affect <u>PRESETS and PROJECTS.</u>	NA

The MOTOR Synth detects any need for calibration upon startup and offers to perform calibration if needed. Additionally, the calibration can be manually started in the SERVICE MODE.

SERVICE MODE	
3105.3M¥	WAVE_CALIB * WAVE_CHECK
MCU: 42.0C M13: 53.6C	EXIT

Note: Disconnect the MOTOR Synth from speakers and headphones when performing calibration, as it may produce loud output.

PADLOCK SCREEN

_ _ _ _ _ _ _ _ _ _ _ _



Nobody knows why that padlock is there.

MIDI IMPLEMENTATION

MIDI basic information

	Transmit/ Export	Recognize/ Import	Remarks
1. Basic information			
MIDI channels	1 – 16	1 – 16	 Available settings from MIDI IN/OUT: BASE CHANNEL - Receive/Transmit CC/PC/NRPN channel; V1 CH, V2 CH, DCO CH - Receive/Transmit midi notes per voice MIDI message filters input: NOTES, RT(Clock), CC/PC, NRPN MIDI message filters output: NOTES, RT(Clock), START/STOP, CC/PC, NRPN
Note numbers	0 - 127	0 - 127	As Motor Synth's input system supports microtonality, it sends closest frequency note on/off messages
Program change	No	Yes	Selects and loads preset from SD card in current bank if exists.
Bank Select response?	No	Yes	Selects current bank if exists in SD card
Mode 1: Omni-On, Poly Mode 2: Omni-On, Mono Mode 3: Omni-Off, Poly Mode 4: Omni-Off, Mono Multi Mode	No No No No	Yes Yes Yes No	Accepts all midi channels, POLY set to maximum (POLY) for all voices, all sound off event Accepts all midi channels, POLY set to minimum (UNI) for all voices, all sound off event Accepts set midi channels, POLY set to max (POLY) for all voices, all sound off event Accepts set midi channels, POLY set to minimum (UNI) for all voices, all sound off event
Note-On Velocity	No	Yes	Assignable with depth coefficient for all envelopes separately (AMP, FILTER, MOD)
Note-Off Velocity	No	No	

Channel Aftertouch (Yes/No)	No	Yes	Assignable to 3 parameters simultaneously (MIDI ASSIGN)
Poly (Key) Aftertouch (Yes/No)	No	No	
Pitch Bend (Yes/No)	No	Yes	Accepts pitch bend in channels set in voice midi channel settings (MIDI IN/OUT)
Active Sensing (Yes/No)	No	No	
System Reset (Yes/No)	No	No	
Tune Request (Yes/No)	No	No	
Universal System Exclusive: Sample Dump Standard Device Inquiry File Dump MIDI Tuning Master Volume Master Balance Notation Information Turn GM1 System On Turn GM2 System On Turn GM2 System Off DLS-1 File Reference Controller Destination Key-based Instrument Ctrl Master Fine/Coarse Tune Other Universal System Exclusive		No No No No No No No No No No No No No	
Manufacturer or Non-Commercial System Exclusive	Yes	Yes	0x00 0x21 0x6D
NRPNs (Yes/No)	Yes	Yes	Motor synth accepts all parameter change including sound and global parameters thru NRPN (see NRPN table).

RPN 00 (Pitch Bend Sensitivity) RPN 01 (Channel Fine Tune) RPN 02 (Channel Coarse Tune) RPN 03 (Tuning Program Select) RPN 04 (Tuning Bank Select) RPN 05 (Modulation Depth Range)	No No No No No	No No No No No	
2. MIDI Timing and Synchronization			
MIDI Clock (Yes/No)	Yes	Yes	Synced SEQUENCER, ARP, MOTION REC, MODULATION options
Song Position Pointer (Yes/No)	No	No	
Song Select (Yes/No)	No	No	
Start (Yes/No) Continue (Yes/No) Stop (Yes/No)	Yes No Yes	Yes Yes Yes	Resets SEQUENCER, ARP, MOTION REC, MODULATION position to start after first MIDI clock event after start event
MIDI Time Code (Yes/No)	No	No	
MIDI Machine Control (Yes/No)	No	No	
MIDI Show Control (Yes/No) If yes, MSC Level supported	No	No	
3. Extensions Compatibility			
General MIDI compatible? Is GM default power-up mode?	No	No	
DLS compatible?	No	No	
Standard MIDI Files	No	No	
XMF Files	No	No	
SP-MIDI compatible?	No	No	

CC MAP

сс	PARAMETER	Transmitted	Recognized	MSB/LSB
0	BANK	No	Yes	MSB only
1	MODWHEEL	No	Yes	MSB. LSB is CC33
2	MOD RATE LFO1	Yes	Yes	MSB. LSB is CC34
3	MOD RATE LFO2	Yes	Yes	MSB. LSB is CC35
4	MOD RATE LFO3	Yes	Yes	MSB. LSB is CC36
5	MOTOR VOL	Yes	Yes	MSB. LSB is CC37
6	DATA ENTRY MSB (used for NRPN)	No	Yes	MSB. LSB is CC38
7	VOLUME	Yes	Yes	MSB. LSB is CC39
8	NULL	Yes	Yes	MSB. LSB is CC40
9	V1 VOL	Yes	Yes	MSB. LSB is CC41
10	V2 VOL	Yes	Yes	MSB. LSB is CC42
11	VCF FC	Yes	Yes	MSB. LSB is CC43
12	NULL	Yes	Yes	MSB. LSB is CC44
13	NULL	Yes	Yes	MSB. LSB is CC45
14	VCF RES	Yes	Yes	MSB. LSB is CC46
15	NULL	Yes	Yes	MSB. LSB is CC47
16	NULL	Yes	Yes	MSB. LSB is CC48
17	VCF EG	Yes	Yes	MSB. LSB is CC49
18	V1 DELAY	Yes	Yes	MSB. LSB is CC50
19	V1 HOLD	Yes	Yes	MSB. LSB is CC51
20	V1 ATTACK	Yes	Yes	MSB. LSB is CC52
21	V1 DECAY	Yes	Yes	MSB. LSB is CC53
22	V2 ATTACK	Yes	Yes	MSB. LSB is CC54
23	V2 DECAY	Yes	Yes	MSB. LSB is CC55
24	V2 DELAY	Yes	Yes	MSB. LSB is CC56
25	V2 HOLD	Yes	Yes	MSB. LSB is CC57
26	VCF ATTACK	Yes	Yes	MSB. LSB is CC58
27	VCF DECAY	Yes	Yes	MSB. LSB is CC59

28	VCF DELAY	Yes	Yes	MSB. LSB is CC60
29	VCF HOLD	Yes	Yes	MSB. LSB is CC61
30	KEYTRACK AMNT	Yes	Yes	MSB. LSB is CC62
31	KEYTRACK GLIDE	Yes	Yes	MSB. LSB is CC63
32	NULL	No	No	RESERVED
33	LSB for CC1 MODWHEEL	Yes	Yes	LSB for CC1
34	LSB for CC2 MOD RATE LFO1	Yes	Yes	LSB for CC2
35	LSB for CC3 MOD RATE LFO2	Yes	Yes	LSB for CC3
36	LSB for CC4 MOD RATE LFO3	Yes	Yes	LSB for CC4
37	LSB for CC5 MOTOR VOL	Yes	Yes	LSB for CC5
38	LSB for CC6 DATA ENTRY MSB (used for NRPN)	Yes	Yes	LSB for CC6
39	LSB for CC7 VOLUME	Yes	Yes	LSB for CC7
40	LSB for CC8 NULL	Yes	Yes	LSB for CC8
41	LSB for CC9 V1 VOL	Yes	Yes	LSB for CC9
42	LSB for CC10 V2 VOL	Yes	Yes	LSB for CC10
43	LSB for CC11 VCF FC	Yes	Yes	LSB for CC11
44	LSB for CC12 NULL	Yes	Yes	LSB for CC12
45	LSB for CC13 NULL	Yes	Yes	LSB for CC13
46	LSB for CC14 VCF RES	Yes	Yes	LSB for CC14
47	LSB for CC15 NULL	Yes	Yes	LSB for CC15
48	LSB for CC16 NULL	Yes	Yes	LSB for CC16
49	LSB for CC17 VCF EG	Yes	Yes	LSB for CC17
50	LSB for CC18 V1 DELAY	Yes	Yes	LSB for CC18
51	LSB for CC19 V1 HOLD	Yes	Yes	LSB for CC19
52	LSB for CC20 V1 ATTACK	Yes	Yes	LSB for CC20
53	LSB for CC21 V1 DECAY	Yes	Yes	LSB for CC21
54	LSB for CC22 V2 ATTACK	Yes	Yes	LSB for CC22
55	LSB for CC23 V2 DECAY	Yes	Yes	LSB for CC23
56	LSB for CC24 V2 DELAY	Yes	Yes	LSB for CC24
57	LSB for CC25 V2 HOLD	Yes	Yes	LSB for CC25

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58	LSB for CC26 VCF ATTACK	Yes	Yes	LSB for CC26
59	LSB for CC27 VCF DECAY	Yes	Yes	LSB for CC27
60	LSB for CC28 VCF DELAY	Yes	Yes	LSB for CC28
61	LSB for CC29 VCF HOLD	Yes	Yes	LSB for CC29
62	LSB for CC30 KEYTRACK AMNT	Yes	Yes	LSB for CC30
63	LSB for CC31 KEYTRACK GLIDE	Yes	Yes	LSB for CC31
64	SUSTAIN on/off NOT SUPPORTED	No	No	LSB only
65	ACCEL LINK	Yes	Yes	LSB only
66	ENV LINK	Yes	Yes	LSB only
67	CROSS PW	Yes	Yes	LSB only
68	CROSS MOD	Yes	Yes	LSB only
69	DRIVE	Yes	Yes	LSB only
70	TONE V1	Yes	Yes	LSB only
71	TONE V2	Yes	Yes	LSB only
72	V1 ACCEL	Yes	Yes	LSB only
73	V1 ACCEL FROM	Yes	Yes	LSB only
74	V1 BRAKE	Yes	Yes	LSB only
75	V1 BRAKE TO	Yes	Yes	LSB only
76	V2 ACCEL	Yes	Yes	LSB only
77	V1 ACCEL FROM	Yes	Yes	LSB only
78	V2 BRAKE	Yes	Yes	LSB only
79	V1 BRAKE TO	Yes	Yes	LSB only
80	V1 SUSTAIN	Yes	Yes	LSB only
81	V1 RELEASE	Yes	Yes	LSB only
82	V2 SUSTAIN	Yes	Yes	LSB only
83	V2 RELEASE	Yes	Yes	LSB only
84	VCF SUSTAIN	Yes	Yes	LSB only
85	VCF RELEASE	Yes	Yes	LSB only
86	OSC DRIFT RATE	Yes	Yes	LSB only
87	NULL	Yes	Yes	LSB only

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88	NULL	Yes	Yes	LSB only
89	MOD1 CLK SRC	Yes	Yes	LSB only
90	MOD2 CLK SRC	Yes	Yes	LSB only
91	MOD3 CLK SRC	Yes	Yes	LSB only
92	OSC DETUNE	Yes	Yes	LSB only
93	V1 DETUNE	Yes	Yes	LSB only
94	V2 DETUNE	Yes	Yes	LSB only
95	KEYTRACK	Yes	Yes	LSB only
96	DATA INCREMENT NOT SUPPORTED	No	No	LSB only
97	DATA DECREMENT NOT SUPPORTED	No	No	LSB only
98	NRPN LSB (see NRPN parameter list)	Yes	Yes	LSB
99	NRPN MSB (see NRPN parameter list)	Yes	Yes	MSB
100	RPN NOT SUPPORTED	No	No	LSB
101	RPN NOT SUPPORTED	No	No	MSB
102	MOD1 SHAPE	Yes	Yes	LSB only
103	MOD2 SHAPE	Yes	Yes	LSB only
104	MOD3 SHAPE	Yes	Yes	LSB only
105	MOD DEPTH 1A	Yes	Yes	LSB only
106	MOD DEPTH 1B	Yes	Yes	LSB only
107	MOD DEPTH 2A	Yes	Yes	LSB only
108	MOD DEPTH 2B	Yes	Yes	LSB only
109	MOD DEPTH 3A	Yes	Yes	LSB only
110	MOD DEPTH 3B	Yes	Yes	LSB only
111	V1 SCALE	Yes	Yes	LSB only
112	V2 SCALE	Yes	Yes	LSB only
113	CROSS SCALE	Yes	Yes	LSB only
114	V1 WAVE	Yes	Yes	LSB only
115	V2 WAVE	Yes	Yes	LSB only
116	FM AM	Yes	Yes	LSB only
117	VCF TYPE	Yes	Yes	LSB only

118	V1 FILT	Yes	Yes	LSB only
119	V2 FILT	Yes	Yes	LSB only
120	All Sound Off	No	Yes	LSB only (any value)
121	Reset All Controllers	No	Yes	LSB only (any value)
122	Local Control On/Off	No	Yes	LSB only (any value)
123	All Notes Off	No	Yes	LSB only (any value)
124	Omni Mode Off (+ all notes off)	No	Yes	LSB only (any value)
125	Omni Mode On (+ all notes off)	No	Yes	LSB only (any value)
126	Mono Mode On (all voices to minimal poly setting, + all notes off)	No	Yes	LSB only (any value)
127	Poly Mode On (all voices to max poly setting, + all notes off)	No	Yes	LSB only (any value)

NRPN MAP

NRPN ADDR	PARAMETER	ТҮРЕ	PARAMETER VALUE RANGE	MIDI DATA RANGE (NRPN)	RETAINS
0	V1 VOL	UNIPOLAR FLOAT	0 1	0 16383	No
1	V2 VOL	UNIPOLAR FLOAT	0 1	0 16383	No
2	MOTOR VOL	UNIPOLAR FLOAT	0 1	0 16383	No
9	CLEAN VOL	UNIPOLAR FLOAT	0 1	0 16383	No
10	DRIVE	UNIPOLAR FLOAT	0 1	0 16383	No
13	VCF RES	UNIPOLAR FLOAT	0 1	0 16383	No
16	VCF FC	UNIPOLAR INTEGER	0 12000	0 12000	No
19	VCF EG	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
22	V1 DETUNE	BIPOLAR FLOAT	-12 0 12	0 8192 16383	No
23	V2 DETUNE	BIPOLAR FLOAT	-12 0 12	0 8192 16383	No
25	DETUNE MIN	UNIPOLAR INTEGER	-121	01	No
26	DETUNE MAX	UNIPOLAR INTEGER	1 12	0 12	No
27	DRIFT DETUNE	BIPOLAR FLOAT	-50 0 50	0 8192 16383	No
28	CROSS MOD	UNIPOLAR FLOAT	0 1	0 16383	No
29	ALL FREQ	BIPOLAR FLOAT	-1200 0 1200	0 8192 16383	No
30	V1 ACCEL	UNIPOLAR FLOAT	0 1	0 16383	No
31	V1 BRAKE	UNIPOLAR FLOAT	0 1	0 16383	No
32	V1 ACCEL FROM	BIPOLAR INTEGER	-12 0 12	8180 8192 8204	No
33	V1 BRAKE TO	BIPOLAR INTEGER	-12 0 12	8180 8192 8204	No

34	V1 ACCEL CURVE	BIPOLAR FLOAT	-2 0 2	0 8192 16383	No
35	V1 ACCEL MODE	UNIPOLAR INTEGER	0 1	0 1	No
36	V2 ACCEL	UNIPOLAR FLOAT	0 1	0 16383	No
37	V2 BRAKE	UNIPOLAR FLOAT	O 1	0 16383	No
38	V2 ACCEL FROM	BIPOLAR INTEGER	-12 0 12	8180 8192 8204	No
39	V2 BRAKE TO	BIPOLAR INTEGER	-12 0 12	8180 8192 8204	No
40	V2 ACCEL CURVE	BIPOLAR FLOAT	-2 0 2	0 8192 16383	No
41	V2 ACCEL MODE	UNIPOLAR INTEGER	0 1	0 1	No
48	V1 WAVE	UNIPOLAR INTEGER	o 3	03	No
49	V2 WAVE	UNIPOLAR INTEGER	o 3	03	No
51	VCF TYPE V1	UNIPOLAR INTEGER	o 3	03	No
54	V1 SCALE	UNIPOLAR INTEGER	o 4	0 4	No
55	V2 SCALE	UNIPOLAR INTEGER	o 4	0 4	No
57	KEYTR MODE V1	UNIPOLAR INTEGER	0 1	O 1	No
60	KEYTR AMT V1	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
61	KEYTR AMT V2	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
63	KEYTR GLIDE V1	UNIPOLAR FLOAT	o 5	0 16383	No
66	V1 ENV TYPE	UNIPOLAR INTEGER	o 6	o 6	No
67	V1 DELAY	UNIPOLAR FLOAT	o 5	0 16383	No
68	V1 ATTACK	UNIPOLAR FLOAT	0 20	0 16383	No
69	V1 DECAY	UNIPOLAR FLOAT	0 20	0 16383	No
70	V1 SUSTAIN	UNIPOLAR FLOAT	O 1	0 16383	No
71	V1 HOLD	UNIPOLAR FLOAT	o 5	0 16383	No
72	V1 RELEASE	UNIPOLAR FLOAT	0 20	0 16383	No
73	V1 ATT CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
74	V1 DEC CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
75	V1 SUS TIME	UNIPOLAR FLOAT	0 20	0 16383	No
76	V1 REL CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
77	V1 ENV RST	UNIPOLAR INTEGER	0 1	O 1	No
78	V1 VEL SCALE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
79	V2 ENV TYPE	UNIPOLAR INTEGER	o 6	06	No
80	V2 DELAY	UNIPOLAR FLOAT	o 5	0 16383	No
81	V2 ATTACK	UNIPOLAR FLOAT	0 20	0 16383	No
82	V2 DECAY	UNIPOLAR FLOAT	0 20	0 16383	No
83	V2 SUSTAIN	UNIPOLAR FLOAT	0 1	0 16383	No
84	V2 HOLD	UNIPOLAR FLOAT	o 5	0 16383	No
85	V2 RELEASE	UNIPOLAR FLOAT	0 20	0 16383	No
86	V2 ATT CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
87	V2 DEC CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
88	V2 SUS TIME	UNIPOLAR FLOAT	0 20	0 16383	No
89	V2 REL CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
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90	V2 ENV RST	UNIPOLAR INTEGER	0 1	0 1	No
91	V2 VEL SCALE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
105	VCF ENV TYPE	UNIPOLAR INTEGER	o 6	o 6	No
106	VCF DELAY	UNIPOLAR FLOAT	o 5	0 16383	No
107	VCF ATTACK	UNIPOLAR FLOAT	0 20	0 16383	No
108	VCF DECAY	UNIPOLAR FLOAT	0 20	0 16383	No
109	VCF SUSTAIN	UNIPOLAR FLOAT	0 1	0 16383	No
110	VCF HOLD	UNIPOLAR FLOAT	o 5	0 16383	No
111	VCF RELEASE	UNIPOLAR FLOAT	0 20	0 16383	No
112	VCF ATT CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
113	VCF DEC CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
114	VCF SUS TIME	UNIPOLAR FLOAT	0 20	0 16383	No
115	VCF REL CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
116	VCF ENV RST	UNIPOLAR INTEGER	O 1	O 1	No
117	VCF VEL SCALE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
144	UNLINK MODE	UNIPOLAR INTEGER	0 1	O 1	No
145	ACCEL LINK	UNIPOLAR INTEGER	04	O 4	No
146	ENV LINK	UNIPOLAR INTEGER	04	O 4	No
148	MOD RATE LFO1	UNIPOLAR FLOAT	0 12	0 16383	No
149	MOD RATE LFO2	UNIPOLAR FLOAT	0 12	0 16383	No
150	MOD RATE LFO3	UNIPOLAR FLOAT	0 12	0 16383	No
151	MOD1 SUBDIV UP	UNIPOLAR INTEGER	o 5	o 5	No
152	MOD1 SUBDIV DOWN	UNIPOLAR INTEGER	09	09	No
153	MOD2 SUBDIV UP	UNIPOLAR INTEGER	o 5	o 5	No
154	MOD2 SUBDIV DOWN	UNIPOLAR INTEGER	09	09	No
155	MOD3 SUBDIV UP	UNIPOLAR INTEGER	o 5	o 5	No
156	MOD3 SUBDIV DOWN	UNIPOLAR INTEGER	09	09	No
157	MOD1 ACT SLOT	UNIPOLAR INTEGER	0 1	O 1	No
158	MOD2 ACT SLOT	UNIPOLAR INTEGER	O 1	O 1	No
159	MOD3 ACT SLOT	UNIPOLAR INTEGER	0 1	0 1	No
160	V1 PITCH MOD	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
161	V1 AMP MOD	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
162	FC MOD	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
163	RES MOD	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
164	V2 PITCH MOD	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
165	V2 AMP MOD	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
166	MOD1 SHAPE	UNIPOLAR INTEGER	0 4	04	No
167	MOD2 SHAPE	UNIPOLAR INTEGER	0 4	0 4	No
168	MOD3 SHAPE	UNIPOLAR INTEGER	04	04	No

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	MOTOR	SYNTH	MKI	USER	MANUAL
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169	MOD1 SLOPE	UNIPOLAR FLOAT	0 1	0 16383	No
170	MOD2 SLOPE	UNIPOLAR FLOAT	0 1	0 16383	No
171	MOD3 SLOPE	UNIPOLAR FLOAT	0 1	0 16383	No
172	MOD1 X OFFS STEP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
173	MOD1 X OFFS TRI	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
174	MOD1 X OFFS SQ	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
175	MOD1 X OFFS SAW UP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
176	MOD1 X OFFS SAW DOWN	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
177	MOD1 Y OFFS STEP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
178	MOD1 Y OFFS TRI	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
179	MOD1 Y OFFS SQ	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
180	MOD1 Y OFFS SAW UP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
181	MOD1 Y OFFS SAW DOWN	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
182	MOD2 X OFFS STEP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
183	MOD2 X OFFS TRI	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
184	MOD2 X OFFS SQ	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
185	MOD2 X OFFS SAW UP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
186	MOD2 X OFFS SAW DOWN	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
187	MOD2 Y OFFS STEP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
188	MOD2 Y OFFS TRI	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
189	MOD2 Y OFFS SQ	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
190	MOD2 Y OFFS SAW UP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
191	MOD2 Y OFFS SAW DOWN	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
192	MOD ₃ X OFFS STEP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
193	MOD3 X OFFS TRI	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
194	MOD3 X OFFS SQ	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
195	MOD3 X OFFS SAW UP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
196	MOD3 X OFFS SAW DOWN	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
197	MOD ₃ Y OFFS STEP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
198	MOD3 Y OFFS TRI	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
199	MOD3 Y OFFS SQ	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
200	MOD3 Y OFFS SAW UP	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
201	MOD3 Y OFFS SAW DOWN	BIPOLAR FLOAT	-0.5 0 0.5	0 8192 16383	No
202	MOD1 CURVE TRI	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
203	MOD1 PW PWM	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
204	MOD1 CURVE SAW UP	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
205	MOD1 CURVE SAW DOWN	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
206	MOD2 CURVE TRI	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
207	MOD2 PW PWM	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
208	MOD2 CURVE SAW UP	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No

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209	MOD2 CURVE SAW DOWN	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
210	MOD3 CURVE TRI	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
211	MOD3 PW PWM	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
212	MOD3 CURVE SAW UP	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
213	MOD3 CURVE SAW DOWN	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
214	STEP MOD1 TYPE	UNIPOLAR INTEGER	04	0 4	No
215	STEP MOD2 TYPE	UNIPOLAR INTEGER	o 4	0 4	No
216	STEP MOD3 TYPE	UNIPOLAR INTEGER	o 4	0 4	No
217	STEP MOD1 STEPS	UNIPOLAR INTEGER	2 8	0 8	No
218	STEP MOD2 STEPS	UNIPOLAR INTEGER	2 8	0 8	No
219	STEP MOD3 STEPS	UNIPOLAR INTEGER	2 8	0 8	No
220	STEP MOD1 PATT	UNIPOLAR INTEGER	0 15	0 15	No
221	STEP MOD2 PATT	UNIPOLAR INTEGER	0 15	0 15	No
222	STEP MOD3 PATT	UNIPOLAR INTEGER	0 15	0 15	No
223	NOISE MOD1 GRAIN	UNIPOLAR FLOAT	0 1	0 16383	No
224	NOISE MOD2 GRAIN	UNIPOLAR FLOAT	0 1	0 16383	No
225	NOISE MOD3 GRAIN	UNIPOLAR FLOAT	0 1	0 16383	No
226	MOD1 ENV TYPE	UNIPOLAR INTEGER	o 6	0 6	No
227	MOD1 DELAY	UNIPOLAR FLOAT	o 5	0 16383	No
228	MOD1 ATTACK	UNIPOLAR FLOAT	0 20	0 16383	No
229	MOD1 DECAY	UNIPOLAR FLOAT	0 20	0 16383	No
230	MOD1 SUSTAIN	UNIPOLAR FLOAT	0 1	0 16383	No
231	MOD1 HOLD	UNIPOLAR FLOAT	o 5	0 16383	No
232	MOD1 RELEASE	UNIPOLAR FLOAT	0 20	0 16383	No
233	MOD1 ATT CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
234	MOD1 DEC CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
235	MOD1 SUS TIME	UNIPOLAR FLOAT	0 20	0 16383	No
236	MOD1 REL CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
237	MOD1 ENV RST	UNIPOLAR INTEGER	0 1	0 1	No
238	MOD2 ENV TYPE	UNIPOLAR INTEGER	o 6	0 6	No
239	MOD2 DELAY	UNIPOLAR FLOAT	o 5	0 16383	No
240	MOD2 ATTACK	UNIPOLAR FLOAT	0 20	0 16383	No
241	MOD2 DECAY	UNIPOLAR FLOAT	0 20	0 16383	No
242	MOD2 SUSTAIN	UNIPOLAR FLOAT	0 1	0 16383	No
243	MOD2 HOLD	UNIPOLAR FLOAT	0 5	0 16383	No
244	MOD2 RELEASE	UNIPOLAR FLOAT	0 20	0 16383	No
245	MOD2 ATT CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
246	MOD2 DEC CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
247	MOD2 SUS TIME	UNIPOLAR FLOAT	0 20	0 16383	No
248	MOD2 REL CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No

249	MOD2 ENV RST	UNIPOLAR INTEGER	O 1	0 1	No
250	MOD3 ENV TYPE	UNIPOLAR INTEGER	o 6	0 6	No
251	MOD3 DELAY	UNIPOLAR FLOAT	o 5	0 16383	No
252	MOD3 ATTACK	UNIPOLAR FLOAT	0 20	0 16383	No
253	MOD3 DECAY	UNIPOLAR FLOAT	0 20	0 16383	No
254	MOD3 SUSTAIN	UNIPOLAR FLOAT	O 1	0 16383	No
255	MOD3 HOLD	UNIPOLAR FLOAT	o 5	0 16383	No
256	MOD3 RELEASE	UNIPOLAR FLOAT	0 20	0 16383	No
257	MOD3 ATT CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
258	MOD3 DEC CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
259	MOD3 SUS TIME	UNIPOLAR FLOAT	0 20	0 16383	No
260	MOD3 REL CURVE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
261	MOD3 ENV RST	UNIPOLAR INTEGER	0 1	0 1	No
274	MOD1 CLK SRC	UNIPOLAR INTEGER	o 4	0 4	No
275	MOD2 CLK SRC	UNIPOLAR INTEGER	04	0 4	No
276	MOD3 CLK SRC	UNIPOLAR INTEGER	04	0 4	No
277	MOD1 PHASE RST	UNIPOLAR INTEGER	O 1	0 1	No
278	MOD2 PHASE RST	UNIPOLAR INTEGER	O 1	0 1	No
279	MOD3 PHASE RST	UNIPOLAR INTEGER	0 1	0 1	No
280	V1 POLY	UNIPOLAR INTEGER	o 3	0 3	No
281	V2 POLY	UNIPOLAR INTEGER	03	0 3	No
283	PWH R LOW	UNIPOLAR INTEGER	-12 0	0 0	No
284	PWH R HI	UNIPOLAR INTEGER	0 12	0 12	No
285	MODW ASSIGN 1	UNIPOLAR INTEGER	0 464	0 464	No
286	MODW ASSIGN 2	UNIPOLAR INTEGER	0 464	0 464	No
287	MODW ASSIGN 3	UNIPOLAR INTEGER	0 464	0 464	No
288	MODW SCALE 1	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
289	MODW SCALE 2	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
290	MODW SCALE 3	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
291	CH PRES ASSIGN V1	UNIPOLAR INTEGER	0 464	0 464	No
292	CH PRES ASSIGN V2	UNIPOLAR INTEGER	0 464	0 464	No
294	CH PR SCALE V1	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
295	CH PR SCALE V2	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
297	ARP V1	UNIPOLAR INTEGER	0 1	0 1	No
298	ARP V2	UNIPOLAR INTEGER	0 1	0 1	No
300	ARP MODE	UNIPOLAR INTEGER	0 5	o 5	No
301	ARP TIME DIV	UNIPOLAR INTEGER	06	0 6	No
302	ARP GATE LEN	UNIPOLAR FLOAT	0.1 1	0 16383	No
303	ARP SWING	UNIPOLAR FLOAT	0.1 0.9	0 16383	No
304	ARP NOTE REPEAT	UNIPOLAR INTEGER	03	0 3	No

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305	ARP PATTERN LEN	UNIPOLAR INTEGER	0 7	0 7	No
306	ARP ACCENT PAT	UNIPOLAR INTEGER	0 9	0 9	No
307	ARP PATT SHIFT	BIPOLAR INTEGER	-12 0 12	8180 8192 8204	No
308	ARP PATT REP	UNIPOLAR INTEGER	0 3	0 3	No
309	KEYS ROOT	UNIPOLAR INTEGER	0 11	0 11	No
310	KEYS SCALE	UNIPOLAR INTEGER	0 10	0 10	No
311	KEYS STEP	UNIPOLAR INTEGER	0 2	0 2	No
312	KEY C B1	UNIPOLAR FLOAT	0 7900	0 16383	No
313	KEY C B2	UNIPOLAR FLOAT	0 7900	0 16383	No
314	KEY C B3	UNIPOLAR FLOAT	0 7900	0 16383	No
315	KEY C B4	UNIPOLAR FLOAT	0 7900	0 16383	No
316	KEY C B5	UNIPOLAR FLOAT	0 7900	0 16383	No
317	KEY C B6	UNIPOLAR FLOAT	0 7900	0 16383	No
318	KEY C B7	UNIPOLAR FLOAT	0 7900	0 16383	No
319	KEY C B8	UNIPOLAR FLOAT	0 7900	0 16383	No
320	VOC LSB	UNIPOLAR FLOAT	3.2189 9.6158	0 16383	No
321	VOC RSB	UNIPOLAR FLOAT	3.2189 9.6158	0 16383	No
322	VOC Q	UNIPOLAR FLOAT	0 2	0 16383	No
323	VOC FC	UNIPOLAR FLOAT	0 2	0 16383	No
324	VOC BLEND	UNIPOLAR FLOAT	0 1	0 16383	No
325	VOC BW	UNIPOLAR FLOAT	-0.5 0.5	0 16383	No
326	VOC FILT COUNT	UNIPOLAR INTEGER	0 3	0 3	No
327	VOC ON	UNIPOLAR INTEGER	0 1	0 1	No
328	VOC IN GAIN	BIPOLAR FLOAT	-20 0 40	0 8192 16383	No
329	OSC DRIFT RATE	BIPOLAR FLOAT	-4 0 4	0 8192 16383	No
330	DETUNE CTRL 2	UNIPOLAR FLOAT	0 1	0 16383	No
331	DETUNE CTRL 3	UNIPOLAR FLOAT	0 1	0 16383	No
332	DETUNE CTRL 4	UNIPOLAR FLOAT	0 1	0 16383	No
333	CROSS V1	UNIPOLAR INTEGER	0 1	O 1	No
334	CROSS V2	UNIPOLAR INTEGER	0 1	O 1	No
336	CROSS PW	UNIPOLAR FLOAT	0 1	0 16383	No
337	CROSS SCALE	UNIPOLAR INTEGER	07	07	No
340	TONE MODE	UNIPOLAR INTEGER	0 1	O 1	No
341	TONE V1	UNIPOLAR FLOAT	0 1	0 16383	No
342	TONE V2	UNIPOLAR FLOAT	0 1	0 16383	No
343	RND VOICE EN	UNIPOLAR INTEGER	07	0 7	No
344	RND D WAVE	UNIPOLAR INTEGER	0 4	04	No
345	RND D AMP ENV	UNIPOLAR INTEGER	04	o 4	No
346	RND D ACCEL	UNIPOLAR INTEGER	0 4	0 4	No
347	RND D VCF	UNIPOLAR INTEGER	04	04	No

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348	RND D DRIVE	UNIPOLAR INTEGER	04	0 4	No
349	RND D NOTES	UNIPOLAR INTEGER	04	0 4	No
350	RND D DETUNE	UNIPOLAR INTEGER	04	0 4	No
351	RND D MOD1	UNIPOLAR INTEGER	04	0 4	No
352	RND D MOD2	UNIPOLAR INTEGER	04	0 4	No
353	RND D MOD3	UNIPOLAR INTEGER	04	0 4	No
354	RND D MOD DST	UNIPOLAR INTEGER	0 1	0 1	No
355	RND D CROSS	UNIPOLAR INTEGER	04	0 4	No
356	RND D ARP	UNIPOLAR INTEGER	04	0 4	No
357	RND D POLY	UNIPOLAR INTEGER	0 1	0 1	No
358	V1 SUS BREAK	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
359	V2 SUS BREAK	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
361	VCF SUS BREAK	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
364	MOD1 SUS BREAK	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
365	MOD2 SUS BREAK	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
366	MOD3 SUS BREAK	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
367	MOD1 VEL SCALE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
368	MOD2 VEL SCALE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
369	MOD3 VEL SCALE	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
370	ARP OCT RANGE	BIPOLAR INTEGER	-2 0 2	8190 8192 8194	No
371	DETUNE EN V1	UNIPOLAR INTEGER	0 1	0 1	No
372	DETUNE EN V2	UNIPOLAR INTEGER	0 1	0 1	No
374	ARP GLOBAL ON	UNIPOLAR INTEGER	0 1	0 1	No
375	MOD1A SCALE	UNIPOLAR FLOAT	0 1	0 16383	No
376	MOD2A SCALE	UNIPOLAR FLOAT	0 1	0 16383	No
377	MOD3A SCALE	UNIPOLAR FLOAT	0 1	0 16383	No
378	MOD1B SCALE	UNIPOLAR FLOAT	0 1	0 16383	No
379	MOD2B SCALE	UNIPOLAR FLOAT	0 1	0 16383	No
380	MOD3B SCALE	UNIPOLAR FLOAT	0 1	0 16383	No
381	V1 FILT	UNIPOLAR INTEGER	0 1	0 1	No
382	V2 FILT	UNIPOLAR INTEGER	0 1	0 1	No
383	FM RING	UNIPOLAR INTEGER	0 1	0 1	No
8192	VOLUME	UNIPOLAR FLOAT	0 1	0 16383	No
8193	IN ROUTE	UNIPOLAR INTEGER	0 1	0 1	Yes
8194	MASTER ROUTE	UNIPOLAR INTEGER	0 1	0 1	Yes
8105		BIPOLAR INTEGER	-12 0 12	8180 8192 8204	No
0195	TUNE	Dir OE/ ((INTEGER			
8196	LATCH	UNIPOLAR INTEGER	0 1	0 1	No
8195 8196 8197	TUNE LATCH V1 M CURVE	UNIPOLAR INTEGER BIPOLAR FLOAT	0 1 -2 0 2	0 1 0 8192 16383	No No
8195 8196 8197 8198	TUNE LATCH V1 M CURVE V2 M CURVE	UNIPOLAR INTEGER BIPOLAR FLOAT BIPOLAR FLOAT	0 1 -2 0 2 -2 0 2	0 1 0 8192 16383 0 8192 16383	No No No

8203	MOD1 M CURVE	BIPOLAR FLOAT	-2 0 2	0 8192 16383	No
8204	MOD2 M CURVE	BIPOLAR FLOAT	-2 0 2	0 8192 16383	No
8205	MOD3 M CURVE	BIPOLAR FLOAT	-2 0 2	0 8192 16383	No
8206	MASTER BPM	UNIPOLAR FLOAT	20 420	0 16383	No
8207	EXT PPQ	UNIPOLAR INTEGER	0 1	0 1	Yes
8208	CV TRIG MODE	UNIPOLAR INTEGER	07	0 7	No
8209	CV1 ASSIGN	UNIPOLAR INTEGER	0 464	0 464	No
8210	CV2 ASSIGN	UNIPOLAR INTEGER	0 464	0 464	No
8211	CV3 ASSIGN	UNIPOLAR INTEGER	0 464	0 464	No
8212	CV1 ATTEN	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
8213	CV2 ATTEN	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
8214	CV3 ATTEN	BIPOLAR FLOAT	-1 0 1	0 8192 16383	No
8215	KEYPAD V1	UNIPOLAR INTEGER	0 1	0 1	No
8216	KEYPAD V2	UNIPOLAR INTEGER	0 1	O 1	No
8218	SEQ EN	UNIPOLAR INTEGER	0 1	0 1	No
8219	VELOCITY CURVE	UNIPOLAR INTEGER	0 3	0 3	No
8220	BANK	UNIPOLAR INTEGER	0 127	0 127	No
8221	PRESET	UNIPOLAR INTEGER	0 127	0 127	No
8222	LOAD KEYBANK	UNIPOLAR INTEGER	0 1	O 1	Yes
8223	IN GATE MODE	UNIPOLAR INTEGER	0 2	0 2	No
8224	IN GATE FOLLOW	UNIPOLAR INTEGER	0 1	O 1	No
8225	IN GATE V1	UNIPOLAR INTEGER	0 1	O 1	No
8226	IN GATE V2	UNIPOLAR INTEGER	0 1	O 1	No
8228	IN TRIG ARP	UNIPOLAR INTEGER	0 1	O 1	No
8229	IN TRIG SEQ	UNIPOLAR INTEGER	0 1	O 1	No
8230	IN GATE THRES	UNIPOLAR FLOAT	-60 0	0 16383	No
8231	IN GATE GAIN	BIPOLAR FLOAT	-20 0 60	0 8192 16383	No
8232	IN GATE ATT	UNIPOLAR FLOAT	0 10	0 16383	No
8233	IN GATE REL	UNIPOLAR FLOAT	0 10	0 16383	No
8234	IN GATE FC	UNIPOLAR FLOAT	0 1	0 16383	No
8235	IN GATE BW	UNIPOLAR FLOAT	0 1	0 16383	No
8236	MIDI BASE CH	UNIPOLAR INTEGER	0 17	0 17	Yes
8237	MIDI CH V1	UNIPOLAR INTEGER	0 17	0 17	Yes
8238	MIDI CH V2	UNIPOLAR INTEGER	0 17	0 17	Yes
8240	MIDI RT IN FILT	UNIPOLAR INTEGER	0 1	O 1	Yes
8241	MIDI CC IN FILT	UNIPOLAR INTEGER	0 1	O 1	Yes
8242	MIDI NOTES IN FILT	UNIPOLAR INTEGER	0 1	0 1	Yes
8243	MIDI CLK OUT FILT	UNIPOLAR INTEGER	0 1	0 1	Yes
8244	MIDI TRANSP OUT FILT	UNIPOLAR INTEGER	0 1	0 1	Yes
8245	MIDI CC OUT FILT	UNIPOLAR INTEGER	0 1	O 1	Yes

8246	MIDI NRPN OUT FILT	UNIPOLAR INTEGER	0 1	0 1	Yes
8247	MIDI NOTES OUT FILT	UNIPOLAR INTEGER	0 1	0 1	Yes
8248	POT BEHAVIOR	UNIPOLAR INTEGER	0 2	0 2	Yes
8249	STROBE BRIGHT	UNIPOLAR INTEGER	0 2	0 2	Yes
8250	BUT BRIGHT	UNIPOLAR INTEGER	0 2	0 2	Yes
8251	CUTOFF UNITS	UNIPOLAR INTEGER	0 1	0 1	Yes
8252	RND DEPTH	UNIPOLAR FLOAT	0 1	0 16383	No
8253	SEQ RAND ALL STEPS	UNIPOLAR INTEGER	0 1	0 1	No
8254	SEQ RAND NOTE STEP	UNIPOLAR INTEGER	0 2	0 2	No
8255	SEQ RAND BASE	UNIPOLAR INTEGER	05	0 5	No
8256	SEQ RAND RANGE	UNIPOLAR INTEGER	05	0 5	No
8257	SEQ RAND VEL	UNIPOLAR INTEGER	0 4	0 4	No
8258	SEQ RAND GATELEN	UNIPOLAR INTEGER	0 4	0 4	No
8259	SEQ RAND MUTE	UNIPOLAR INTEGER	04	0 4	No
8260	SEQ RAND MICRO	UNIPOLAR INTEGER	0 4	0 4	No
8261	SEQ RAND RATCH	UNIPOLAR INTEGER	0 4	0 4	No
8262	SEQ RAND PROB	UNIPOLAR INTEGER	0 4	O 4	No
8263	SEQ RAND REP	UNIPOLAR INTEGER	0 4	0 4	No
8264	KEEP STOLEN	UNIPOLAR INTEGER	0 1	0 1	Yes
8265	MOT STARTUP	UNIPOLAR INTEGER	0 2	0 2	Yes
8266	MIDI OUT NOTE SRC	UNIPOLAR INTEGER	0 1	0 1	Yes
8267	RND LOAD EN	UNIPOLAR INTEGER	0 1	0 1	Yes
8268	PARAM POPUP TIME	UNIPOLAR INTEGER	0 9	0 9	Yes
8269	SEQ RAND GLIDE	UNIPOLAR INTEGER	05	0 5	No
8270	INIT PRESET REF	UNIPOLAR INTEGER	0 0x00FFFFFF	0 0X00FFFFF	Yes
8271	ARP LOAD EN	UNIPOLAR INTEGER	0 1	0 1	Yes
8272	VAL FREEZE AT ASSIGN	UNIPOLAR INTEGER	0 1	0 1	Yes
8273	INIT TUNING	UNIPOLAR INTEGER	0 63	0 63	Yes
8274	MIDI CLK WHEN STOP	UNIPOLAR INTEGER	0 1	0 1	Yes

MIDI SYSEX

GENERAL INFO REQUEST

Sysex status byte [1 byte]	OxFO
Real-time/None Real-time byte [1 byte]	0x7E
Ping in this general channel [] bytes]	0xhh (if 0x7F responds if any channel)

General info (subID - 1) [1 byte]	0x06
Gen. info request(subID - 2) [1 byte]	0x01
End of sysex [] byte]	F7

GENERAL INFO RESPONSE

Sysex status byte [] byte]	0xF0
Real-time/None Real-time byte [1 byte]	0x7E
MS Base channel [1 bytes]	0xhh (0x7F if all)
General info (subID - 1) [1 byte]	0x06
Gen. info replay(subID - 2) [1 byte]	0x02
Manufacturers System Exclusive id code [3 byte]	0x00 0x21 0x6D
Device family code [2 bytes]	0x00 0x01
Device family member code [2 bytes]	0x00 0x01
Software revision level. Format device specific [2 bytes now]	0x00 0x01
End of sysex [] byte]	F7

GLOBAL PARAMETER REQUEST

Sysex status byte [1 byte]	0xF0
Real-time/None Real-time byte [1 byte]	0x7E
Ping in this general channel [1 bytes]	0xhh (if 0x7F responds if any channel)
Data Dump (subID - 1) [1 byte]	0x07
Gen. param dump request (subID - 2) [1 byte]	0x01
Manufacturers System Exclusive id code [3 bytes]	0x00 0x21 0x6D
End of sysex [1 byte]	F7

GLOBAL PARAMETER DUMP

Sysex status byte [] byte]	0xF0

Real-time/None Real-time byte [1 byte]	0x7E
Manufacturers System Exclusive id code [3 bytes]	0x00 0x21 0x6D
Data Dump (subID - 1) [1 byte]	0x07
Global param dump request (subID - 2) [1 byte]	0x01
Device family code [2 bytes]	0x00 0x01
Device family member code [2 bytes]	0x00 0x01
All Global parameter value data in 14b format (MSB, LSB) ordered by NRPN ID [size: parameter count x 2 bytes]	0xhh 0xhh 0xhh 0xhh
End of sysex [1 byte]	F7

SOUND PARAMETER REQUEST

Sysex status byte [1 byte]	0xF0
Real-time/none Real-time byte [1 byte]	0x7E
Ping in this general channel [1 bytes]	0xhh (if 0x7F responds if any channel)
Data Dump (subID - 1) [1 byte]	0x07
Sound parameter dump request (subID - 2) [1 byte]	0x02
Manufacturers System Exclusive id code [3 bytes]	0x00 0x21 0x6D
End of sysex [1 byte]	F7

SOUND PARAMETER DUMP

Sysex status byte [1 byte]	0xF0
Real-time/None Real-time byte [1 byte]	0x7E
Manufacturers System Exclusive id code [3 bytes]	0x00 0x21 0x6D
Data Dump (subID - 1) [1 byte]	0x07
Sound parameter dump request (subID - 2) [1 byte]	0x02
Device family code [2 bytes]	0x00 0x01
Device family member code [2 bytes]	0x00 0x01

All Sound parameter value data in 14b format (MSB, LSB) ordered by NRPN ID [size: parameter count x 2 bytes]	0xhh 0xhh 0xhh 0xhh
End of sysex [1 byte]	F7



FIRMWARE UPDATE

Description

The MOTOR Synth Firmware updates allow for new features to be released in future and bug fixes if discovered.

Note: Firmware version 1.2 introduces major updates. PRESETS created with an older firmware version might not function on version 1.2 and later. It is possible to convert the PRESETS to work on version 1.2 and later. Please refer to <u>Firmware version 1.2 PRESET converter</u> section.

Procedures

Check Firmware version

The Firmware version can be checked in the **SETTINGS MENU, SERVICE SCREEN**.

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Update Firmware

The Firmware can be updated by <u>downloading the firmware file</u> (main.hex) and copying it onto the SD card's root folder and restarting the MOTOR Synth.

The SD card can be browsed on a computer, by inserting the SD card in a card reader or by connecting the MOTOR Synth via USB cable and switching on USB MODE on the MOTOR Synth.

When connected via USB cable, power off the MOTOR Synth. Press and hold **CTRL + ALT + DEL** and power on the MOTOR Synth. This will enter the USB SD CARD MODE. Now it will be visible as a USB drive on your computer.

Copy the main.hex file to the root folder of the SD card.



main.hex in the root folder of the SD card

Restart the MOTOR Synth and it will detect the main.hex file and offer to update the firmware. After updating the MOTOR Synth will delete the main.hex from the SD card.