MD900

Instruction manual

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Foreword

After several years of preliminary work and the great passion for synthesizers, the basis for the MD900 was created. It is characterized by its powerful stereo sound, its analog charm and an intuitive operating concept.

I would like to thank you very much for purchasing the MD900. For all those who only read through this manual I hope to have awakened the curiosity for this extraordinary synthesizer.

On the subject of reading manuals

We have tried to develop a synthesizer which is intuitive to use. Many of the terms are classic and familiar to most, but we still recommend reading this manual. Especially for the operation on the panel with maybe not so obvious functions.

For a better overview you will find a schematic representation of the respective section in the chapters. All names like knobs, sliders and buttons are printed in **BOLD** in the manual and correspond to those on the MD900 panel. Furthermore, the menu items of the touch display are shown in ***BOLD CURSIVE*** in the manual.

Note

A lot of care has been taken in the preparation of this manual to exclude errors and inconsistencies. We apologize in advance for any errors. Mayer-EMI makes no warranties of any kind with respect to this manual, except those required by trade laws.

The content of this manual is subject to change without notice.

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General safety instructions

> ⚠ Please read the following safety instructions carefully! They contain some basic rules for handling electrical devices. Please read all instructions before you put the device into operation.

Suitable installation site

- Operate the MD900 only in closed rooms and avoid humidity and dust.
- Ensure unobstructed air supply to all sides of the device. Do not place the device in the immediate vicinity of heat sources.
- Do not expose the device to direct sunlight or strong vibrations.

Power supply connection

Only use the power supply unit included in the MD900 packages. Refer to the separate instructions for the power supply (included in the power supply packaging). This power supply is designed to power the MD900 and the devices connected to the USB 2.0 host (maximum 1.5A in total).

The scope of delivery also includes country adapters for:

US / EU / UK / AU

Operation

- Do not place any liquids on the MD900 (such as drinks or similar)
- Make sure that the device is stable during operation.
- The MD900 must not be exposed to direct sunlight.
- No heat sources in the immediate vicinity.

Care

Do not open the MD900. Repair and maintenance may only be performed by qualified personnel. In addition, opening the device will void your warranty.

Only use a dry, soft cloth or brush to clean the device housing. Do not use solvents or similar chemicals, they may damage the surface.

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Intended use

The MD900 is exclusively intended for generating and processing audio signals and control signals according to the MIDI standard or USB 2.0 MIDI devices such as controllers or keyboards. Any other use is not permitted and excludes any warranty claims against MAYER-EMI.

Disposal

The MD900 is manufactured in compliance with the European Union RoHS.

Nevertheless, this device is hazardous waste and must not be disposed of in household waste.

For disposal, please contact your dealer or Mayer-EMI (www.mayer-emi.at).

Frontpanel Overview
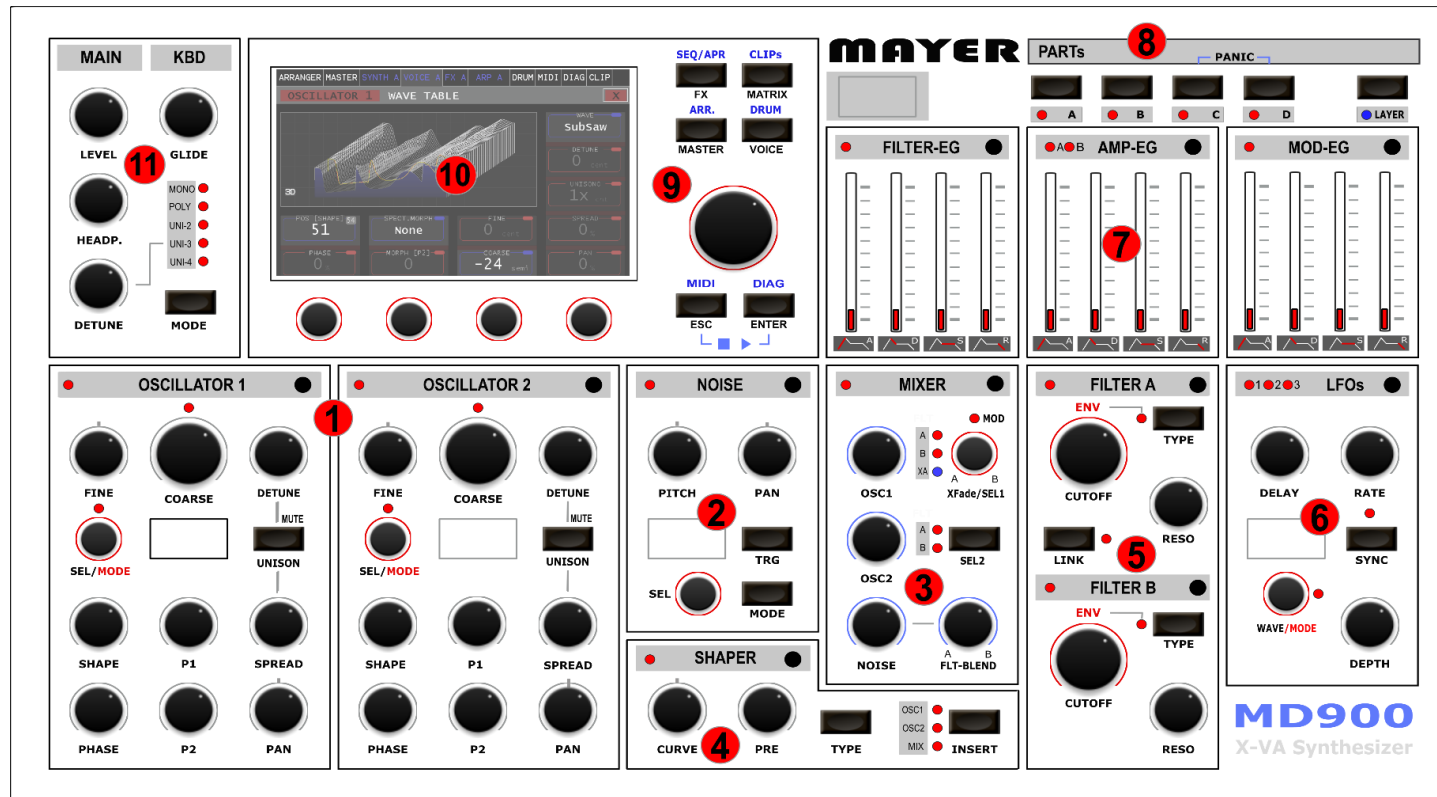
Figure 1. [Front panel]

1. Oscillators (Wavetable & Algorithm)
2. NOISE Oscillator (Sample based)
3. Mixer (OSC1 + OSC2 + Noise)
4. Wave-shaper
5. Filter A/B section
6. LFO section
7. Envelope Generators
8. PART Selection
9. Quick navigation keys & Selection wheel
10. Touch display
11. Keyboard Mode, Volume Main, Volume Headphone

General panel functions

Focus-keys

Most sections have a focus button on the right side of the label bar. After pressing this focus button, the corresponding section is displayed on the touch display. On the left side of the label bar this selection is indicated by a red LED, see Figure 2. [Example LFO Section].

Holding the focus button switches to assignment mode and marks this section as source in the modulation matrix, this is indicated by the LED flashing. Pressing the focus button again terminates the assignment mode. More about this in the [MODULATIONS – MATRIX]

Assistance-Display

Some of the sections have their own assistance display, which shows detailed information. Furthermore, parameter details are displayed during the setting. This is very helpful for the value retrieval function [see TRACKING].

If a parameter is changed via the controller, the corresponding parameter is displayed. The actual value and the controller value are displayed, see Figure 3. [Assistance-Display].
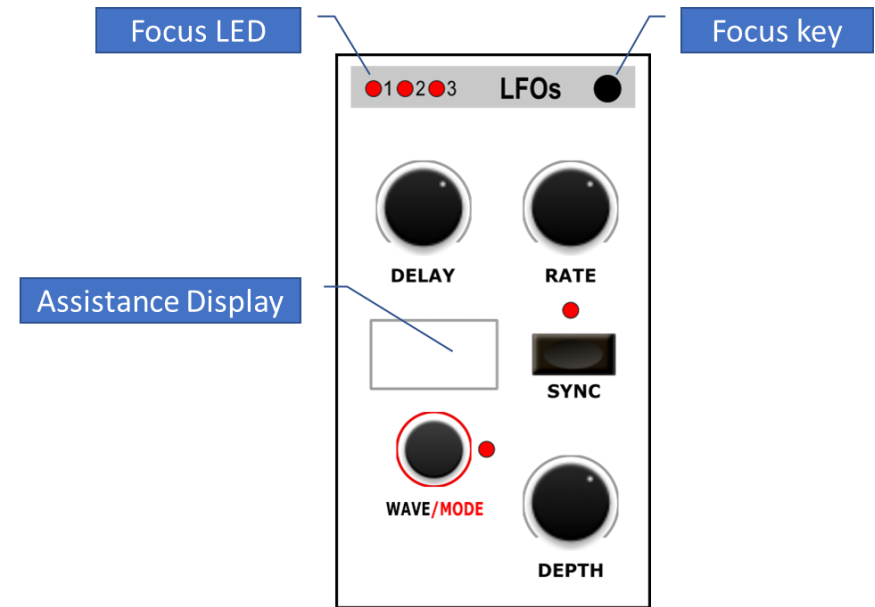
Figure 2. [Example LFO Section]
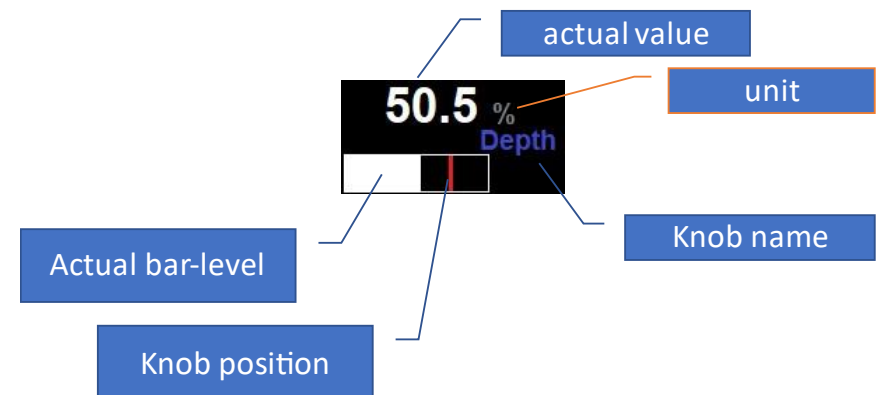
Figure 3. [Assistance-Display]

Rear connections
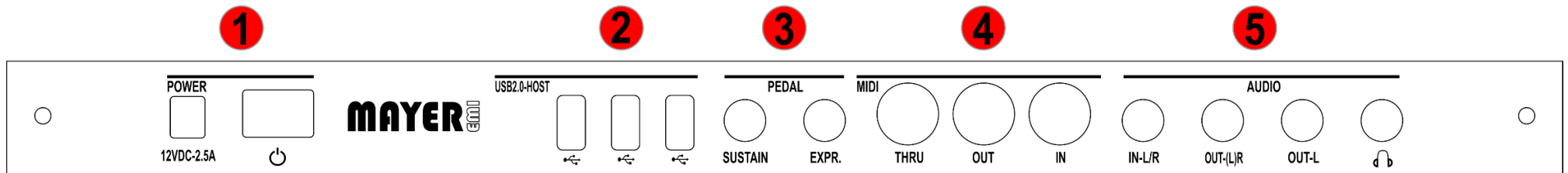
Figure 4. [Connections]

1. Power supply connector, power switch & indicator light
2. USB 2.0 Host connectors
3. Pedal connectors
   - Sustain/Hold Pedal (optional functions see ENVELOPE GENERATORS)
   - Expression Pedal
4. DIN-MIDI Ports (IN, OUT, THRU)
5. Audio connectors
   - Stereo Audio Input (OPTIONAL)
   - Mono – Right channel / stereo audio output
   - Mono – Left channel

Commissioning

The MD900 is powered by an external power supply. Connect the power supply to the rear socket (12VDC-2.5A). Connect the synth to a mixer/audio interface or amplifier via the Audio OUT using 2 mono or 1 stereo cable. Alternatively, you can use headphones. The MD900 can be controlled or played by a keyboard or an external sequencer via MIDI (DIN / USB). Default setup after shipping, the MD900 uses MIDI Channel 1, 2, 3, 4 for Part A, B, C, D from the DIN MIDI IN jack.

MIDI settings [see MIDI Settings]

After powering on the MD900, the Initial Preset [default] is loaded on all 4 Parts.

The MASTER appears in the touch display when the MD900 is ready to play.

Info: After power on, it takes about 40 seconds, until the MD900 is ready to play.

The volume can be adjusted at the MAIN-LEVEL and this also changes the volume of the headphones, which can be adjusted independently via MAIN-HEADP.

The audio outputs are designed with a relatively high level, which is usual for electronic instruments.

Set the volume on your monitor to minimum before turning on the MD900 to reduce on/off switching noise.

Connections details

USB 2.0 Host-Interfaces

The MD900 has 3 x USB 2.0 host ports. These USB ports allow the connection of MIDI "class-compliant" keyboards or controllers. The connected devices are managed in the MIDI menu [see MIDI settings].

USB- Mass storage

The connection of USB standard mass storage devices like USB sticks and SSD is possible. This is used to export/import arrangements/presets/wave/wavetable/MIDI clips.

> (i) Info: Only the FAT/FAT32 file system is supported on the mass storage devices.

Pedal Sustain/Hold

A pedal (normally open or normally closed) can be connected to this mono jack socket. During the switch-on process, the polarity is queried so that pressing the pedal triggers the Sustain/Hold function regardless of the switching function.

The Sustain/Hold function can be selected preset specific (sound program) and per envelope generator. (see ENVELOPE GENERATORS)

- *Sustain*: Selects between two different release times.
- *Hold*: Holds the sustain phase regardless of the release of the keyboard keys.

> (i) Info: The pedal should not be pressed when switching on the MD900, otherwise the corresponding polarity will not be recognized correctly.

Expression Pedal

This is a stereo jack socket to which an expression pedal (volume pedal) can be connected.

In the master [see MASTER] section, the expression pedal can be activated per PART (A; B; C; D).

With the corresponding setting the volumes of the selected PARTs can be changed accordingly.

MIDI IN

This DIN MIDI input jack allows the connection of a MIDI
keyboard or controller according to MIDI 1.0 specification.

The control of the "Drum Sampler [see

DRUM (Sample-Player)] is possible via channel 10.

The assignment of MIDI channels to parts is doable via the menu MIDI [see MIDI Settings].

> Info: If the AUDIO OUT-(L)R is used as stereo output, nothing must be plugged into the jack socket OUT-L.

MIDI THRU

This DIN MIDI output jack, according to MIDI 1.0 specification, forwards the signals received on MIDI input without delay.

MIDI OUT

This DIN MIDI output jack, according to MIDI 1.0 specification, is used to connect external sound generators.

> Info: Further explanations about the functionality of the MIDI interfaces is given with the corresponding synthesizer functions

AUDIO IN-L/R

This stereo jack is an audio input for future expansions (effects etc.) Input level < 2Vpp.

AUDIO OUT-(L)R & OUT-L

The OUT-(L)R stereo jack socket can optionally be connected to a mixer/audio interface/active speakers using a TS stereo cable, or is the Right output. The OUT-L mono jack socket is the Left output.

TOUCH-display overview

The following Figure 5. [Touch-Display] shows the general controls. Continuous controller groups 1-4 allow setting parameters of a corresponding section (e.g. Oscillator 1). Each continuous controller group can have up to 5 levels. I.e. the corresponding parameter of the group can be selected on the touch display and then be changed by means of the endless controller. The pressing function of the endless controller depends on the active parameter and is explained in the corresponding sections.
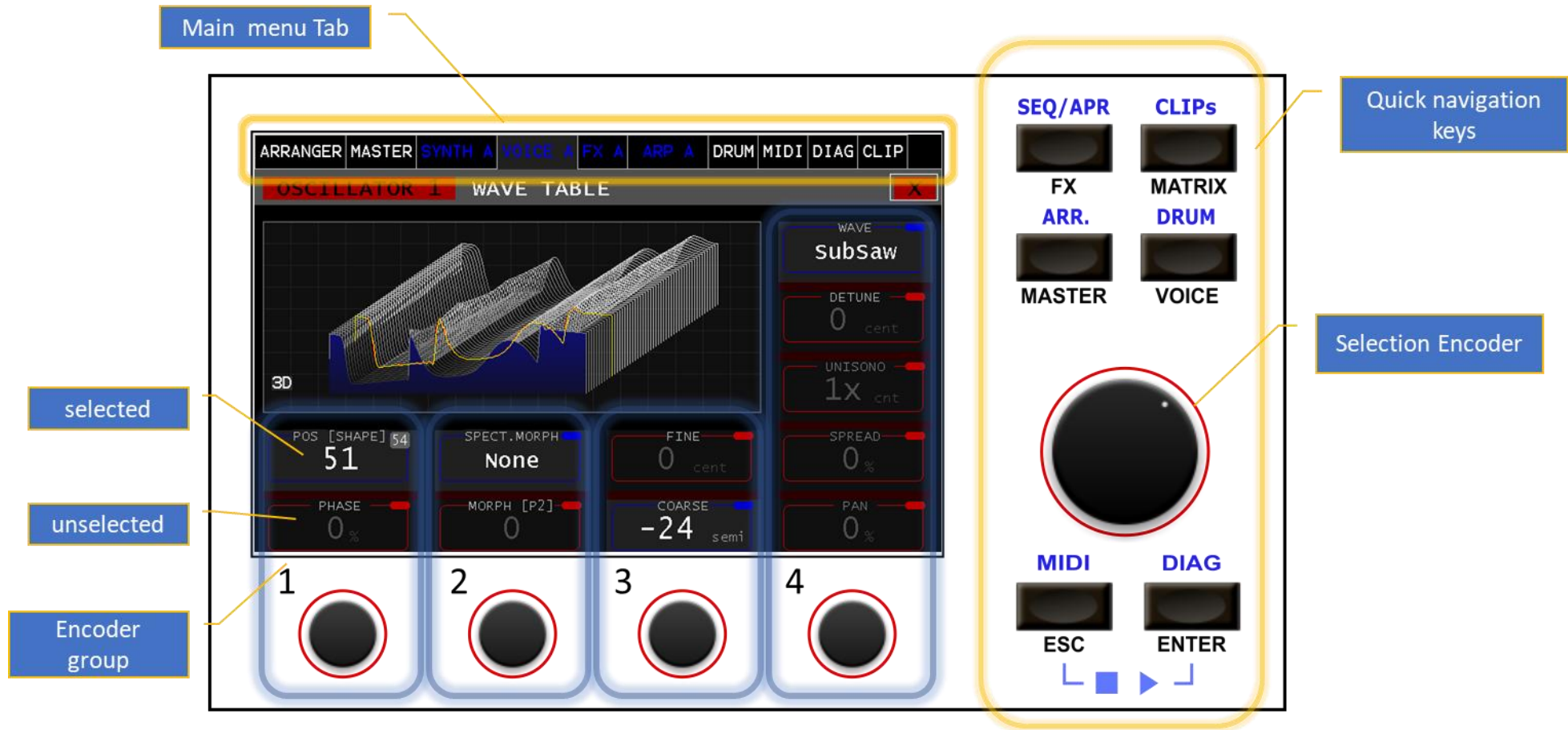

Figure 5. [Touch-Display]

The main menu tab is located in the upper display area. This allows the menu selection to be made via the touch. The quick selection keys allow an alternative, hierarchy-free quick selection into a section or a menu.

The black labeled ones (e.g. VOICE) are triggered by a short press. Longer presses (> 800ms) will select the blue-labeled menu items (such as DRUM).

The selection wheel is used for scrolling or selection. Pressing it activates a selection.

The exact function of the selection wheel depends on the menu and is explained in the corresponding sections.

Pressing the ESC + ENTER key at the same time starts/stops all active sequencers/arpeggiators/drums.

(see Clip-Launcher)

Parameter-Label

In the Figure 6. [Parameter Label] the parameter Label is shown in detail here NAME, VALUE and UNIT are displayed.

MIDI-Learn

If the LABEL has a blue marking in the upper right corner of the frame, the "MIDI Learn Mode" can be activated by pressing and holding (> 3 sec). This is indicated by "L". If now a control signal is received from one of the connected MIDI ports, the assignment to this parameter is done and an automatic scaling is performed. Now the CC number is displayed. Pressing and holding again (> 3 sec) deletes the assignment or ends the "MIDI Learn Mode".
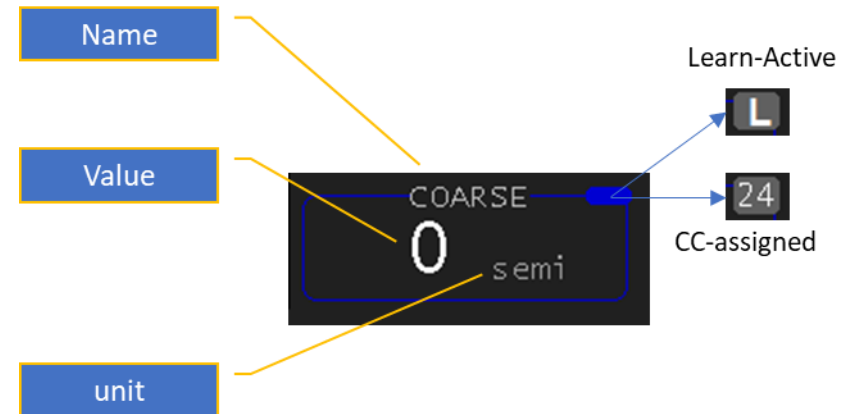
Figure 6. [Parameter Label]

Synthesizer structure
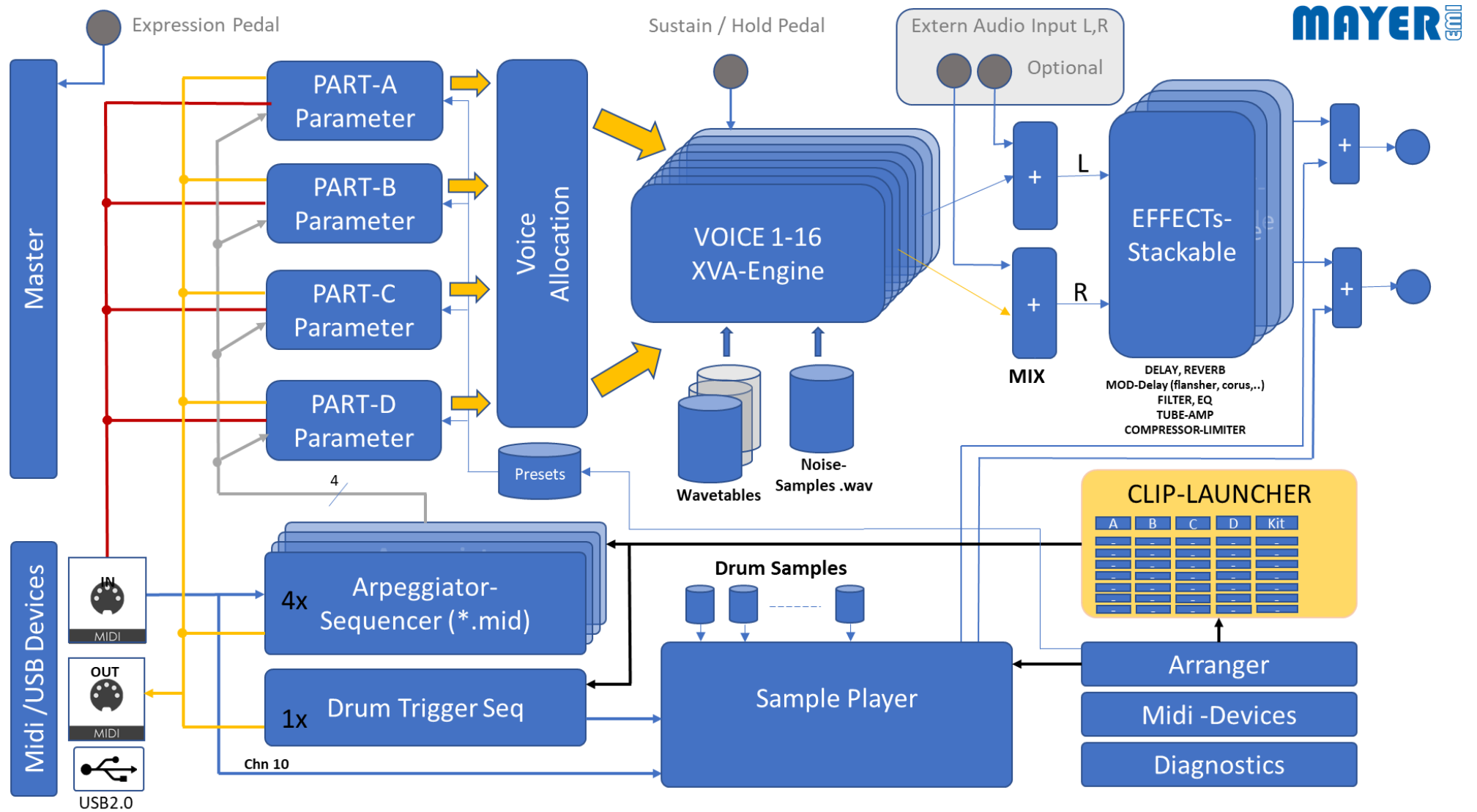
Figure 7. [Synthesizer Structure]

The Figure 7. [Synthesizer Structure] gives an overview of the internal structure of the MD900 and their interrelationships. The components are operated or set via the main menu and are explained in detail in the manual at the corresponding sections. This figure serves for a better understanding. It should be noted that each PART has its own stereo effect section (stack). The sequencers and arpeggiators are also available 4x.

ARRANGER

The arranger in the MD900 allows you to save the entire setting.

These are:
Presets (of all PARTS A, B, C, D), Drum Kits (Instruments), Samples, Clips, Sequencer/Arpeggiator and Arrangement specific MIDI settings. This makes a setting loadable and ready to play with one keystroke.
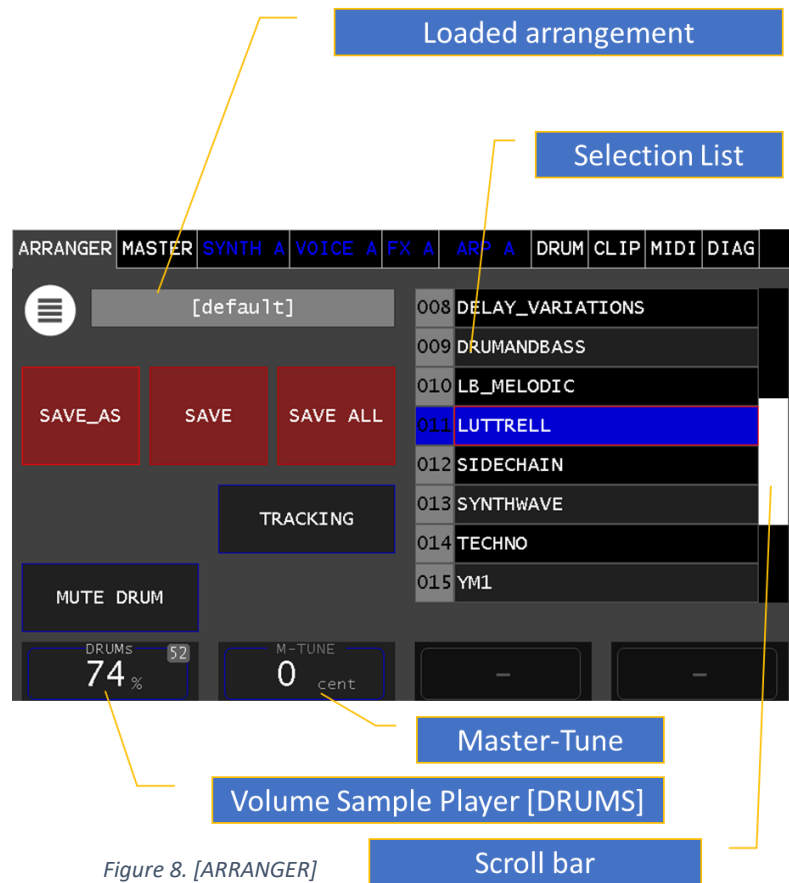
The selection list can be moved by the selection wheel or by the scroll bar up/down (dragging) and then selected (loaded) by touching the row.

After the arrangement has been loaded, the MIDI settings are taken from the arrangement (the MIDI settings are stored in the arrangement). If necessary, these can be adjusted. Save the arrangement afterwards with SAVE/SAVE_AS to save your MIDI settings.

⚠️ Attention: After starting the MD900 the [default] arrangement is loaded. In this case the MIDI settings are automatically saved as basic settings. If you then save this [default] arrangement with SAVE_AS under a new name, these MIDI settings will be applied.

When you load an arrangement, the MIDI settings of the arrangement are applied.

Figure 8. [ARRANGER]

Loaded arrangement

Selection List

Master-Tune

Volume Sample Player [DRUMS]

Scroll bar

SAVE

Save the arrangement with its current name.

SAVE AS

Opens a keyboard, Figure 15 [ALPHA-KBD], and allows to save the arrangement with a new name.

⚠️ Attention: Only the arrangement, i.e. the references to the loaded presets, drum kits and clip-launcher are saved - not their content.

Contents of the references must be saved separately or by pressing SAVE ALL.

SAVE ALL

This saves not only the references, but also the changes in all references. Presets (of all PARTS A, B, C, D), Drum Kits (Instruments), Samples, Clips, Sequencer/Arpeggiator settings and the arrangement itself.

DRUMs

This parameter changes the volume of the sample player.

MUTE DRUM

Toggle the Drums (Sample Player) output on/off.

TRACKING

After power on of the MD900, this function is deactivated. Every movement of the controller is taken over immediately, which can lead to value jumps. If tracking is activated, changes are only taken over when the controller value reaches above/below the current value. Thus, jumps in the value can be avoided. See Figure 3. [Assistance-Display]

ⓘ Info: If the tracking function is activated, please don't be surprised if you don't notice any change when turning a knob. Look at the assistance display to get informed about the current position.

M-TUNE

The parameter M-TUNE (MASTER TUNE) allows tuning all four synthesizers A, B, C, D together, this is done in +- 100 cents.

DRUM (Sample-Player)

The Drum Sample Player can be considered as the 5th part.

It allows to play up to 14 samples simultaneously. This sample player is used for "one shot samples" (drum, percussion, noises etc.) and can be triggered by the internal "drum sequencer" or externally via MIDI channel 10. Therefore, we call it only briefly **DRUM**.

> ⓘ Info: The samples for DRUM/NOISE (wave files) can be loaded into the MD900 by the user.
>
> (see md900-backup-restore-en.pdf)

KIT

The drum kit groups the 14 instruments (e.g. kick, snare, hats, toms percussions etc.) together with all their settings and sample selections. See Figure 9. [Drum KIT]
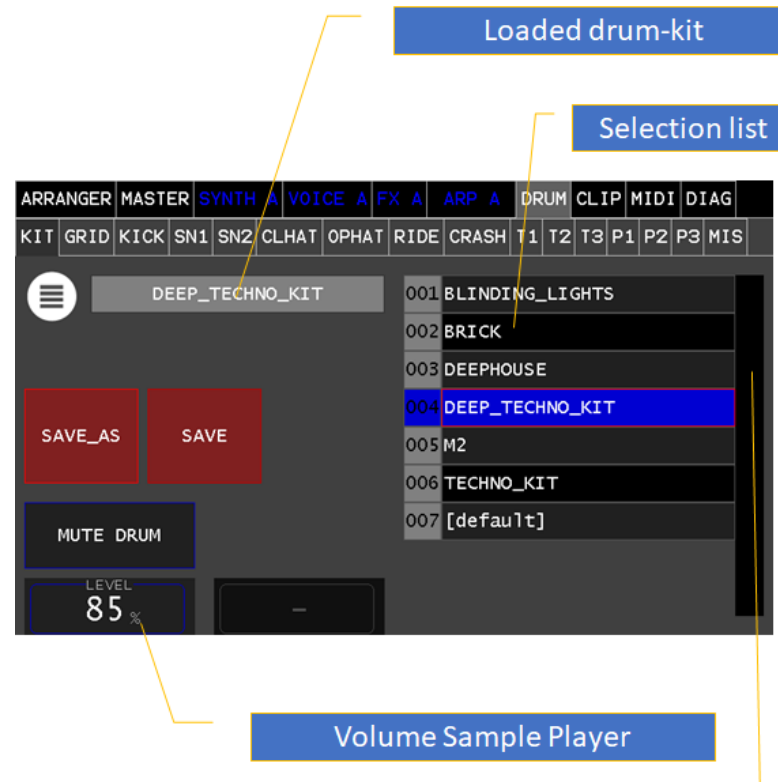

Figure 9. [Drum KIT]

GRID see DRUM-Pattern

INSTRUMENTS

To clarify the relationships, let's have a look on the file structure:

For the Instruments see Figure 10 [DRUM-SAMPLE STRUCTURE]. This shows the relationship to the file structure. Each instrument has its access location to its samples which are offered for selection (Samples selection list).
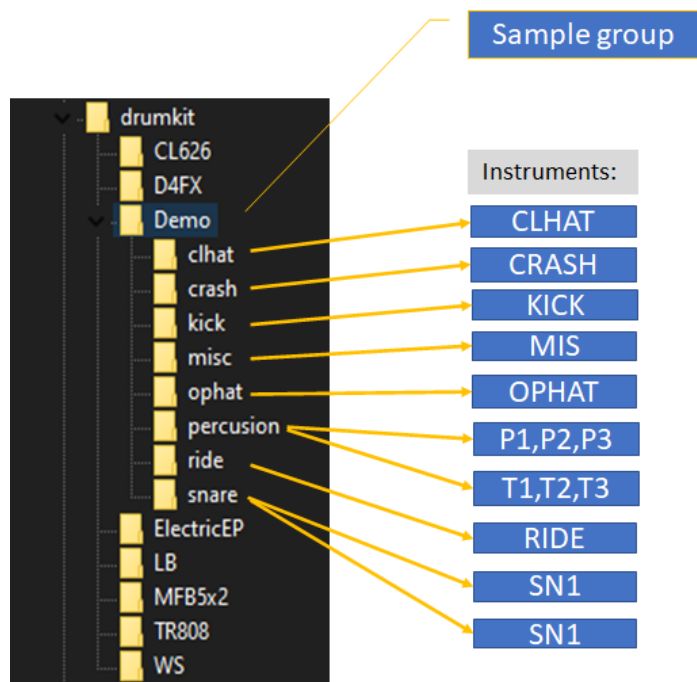

Figure 10. [DRUM-SAMPLE STRUCTURE]

The independent drum instruments are one-shot sample players.

Figure 11. [DRUM-INSTRUMENT]

Selection FILTER

By means of this parameter the displayed list can be filtered by sample groups.

Sidechain

This parameter allows mixing these instruments to the sidechain bus. This bus can be processed in the effect section. (e.g. Dynamic Compressor)

Fadeout

Specifies the fadeout time (END) in ms.

Info: The DRUM sample player is quasi the 5th PART and can play 14 samples simultaneously. It does not need any resources from the synth engine.

START

Start point selection in % (total length). The system automatically tries to set this start point as close as possible to a zero crossing.

END

End point selection in % (total length). It is automatically tried to set this end point as close as possible to a zero crossing. In addition, the signal is faded out during the set time (fadeout).

PITCH

Change the output frequency in % relative to the sample base frequency.

KEY

Sets the MIDI note to which this instrument can be triggered by MIDI channel 10.

PARTs

The MD900 is equipped with 4 parts, so it can produce four different sounds simultaneously. The up to 16 stereo voices for these sounds are divided. The advantage is that the polyphony can be distributed to the sounds where it is needed. In other words, there are 4 synthesizers (we call them PARTs) which share a common voice pool.

Now it is a matter of on the one hand loading the sound presets for the corresponding PARTs and on the other hand assigning the operation, be it via the TOUCH display or the control panel, to the corresponding PART. This is done in the PARTs section with the help of the buttons A-D with which this switching takes place. As in Figure 12. [PART] displayed, PARTs A-D are distinguished by colors for better orientation. These colors and letters are also shown in the assistance displays.
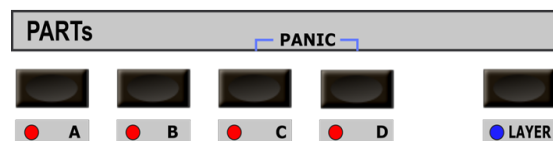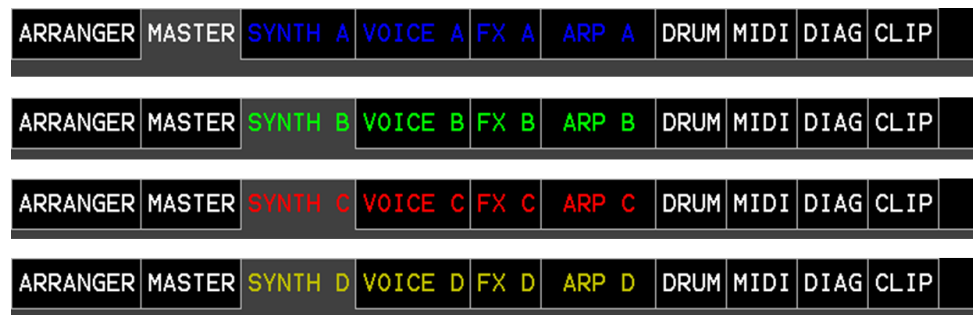

Figure 12. [PART selection]

Info: The white labeled menu items are not PART specific and apply generally

SYNTH A (B, C, D)

Preset-Selection

This colored main menu tab represents the synthesizer of the corresponding PART. The colored distinction serves for a better orientation which SYNTH (Part) is active at the PANEL or in the main menu. In this section, SYNTH A is used for explanation and applies to the others (B, C, D) in the same way.
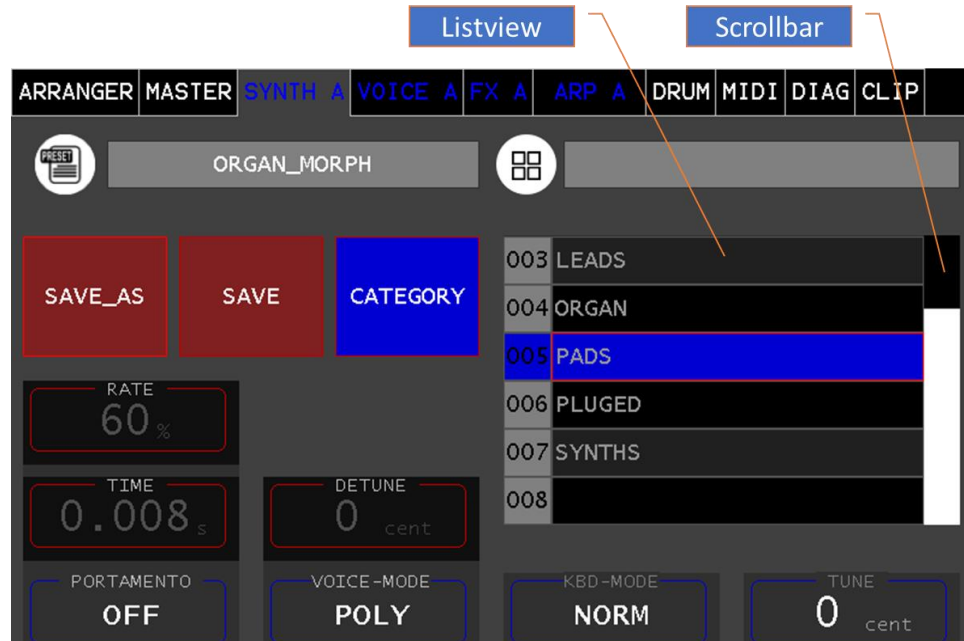
Figure 13. [Category]

The presets are grouped by the **category**. With the button of the same name the "List View" can be switched to select one. See Figure 13. [Category].

If a category is now selected in the "List View", the presets are listed and can now be selected and loaded in the same way. See Figure 14. [Presets]

Figure 14. [Presets]

Save Preset

Saving a loaded preset is done by pressing the SAVE key. All current settings of the SYNTH-A are saved under the same name.

SAVE PRESET AS

The touch-button SAVE_AS opens the keyboard and allows saving under new names, see Figure 15. [Keypad].

By pressing the **OK** key, the preset is saved under the entered name.

If you press the [x] key, you will return to the preset selection without saving.

Figure 15. [Keypad]

Tune

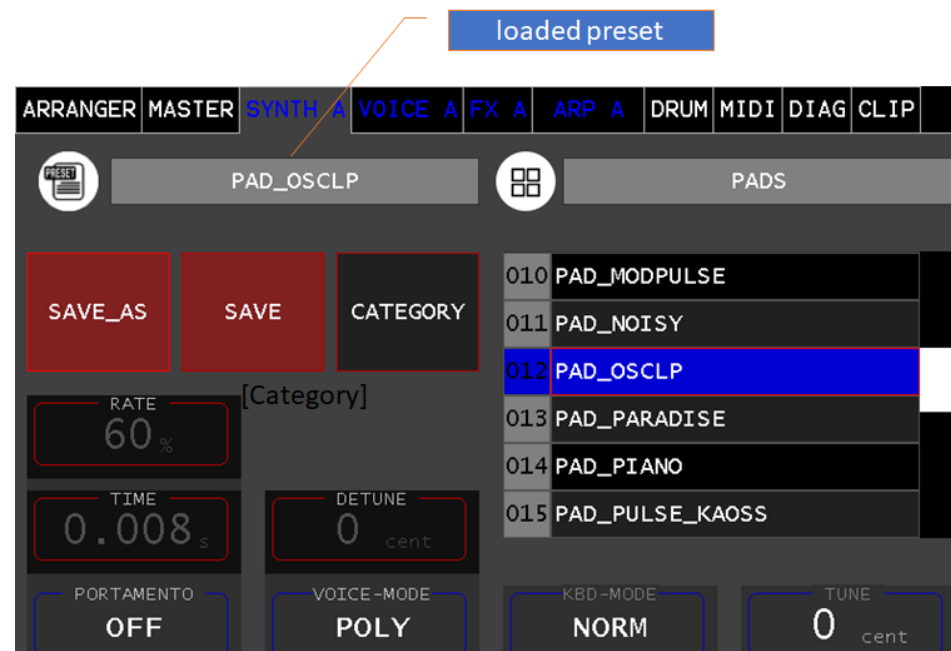The TUNE parameter can be used to adjust the tuning of the corresponding SYNTH in cents [+/-100] to the normal tuning.

Voice-Mode

With the VOICE-MODE parameter you can define how the voice assignment should be done.

- MONO: monophonic, the same voice is always assigned and emulates the behavior of a monophonic synthesizer.
- POLY: Is the polyphonic mode
- UNI2, 3, 4: UNISONO assigns 2, 3, 4 voices

> (i) Info: The VOICE-MODE parameter can also be set on the panel using the MODE key. The set MODE is indicated by the corresponding LEDs. See Figure 1. [Front panel] ⑪

MASTER

This panel shows, with the two oscilloscopes, the signals Main [L]eft and Main [R]ight respectively, as they are passed on in sequence to the DAC (Digital Analog Converter). Thus, the end of the entire signal chain is visualized.

LEVEL

The parameters [**A, B, C, D**] allow to mix the respective SYNTHs (A, B, C, D) into the stereo sum.

The drum sample player has this level in the **ARRANGER** tab and allows mixing into the stereo sum.
See **ARRANGER**.
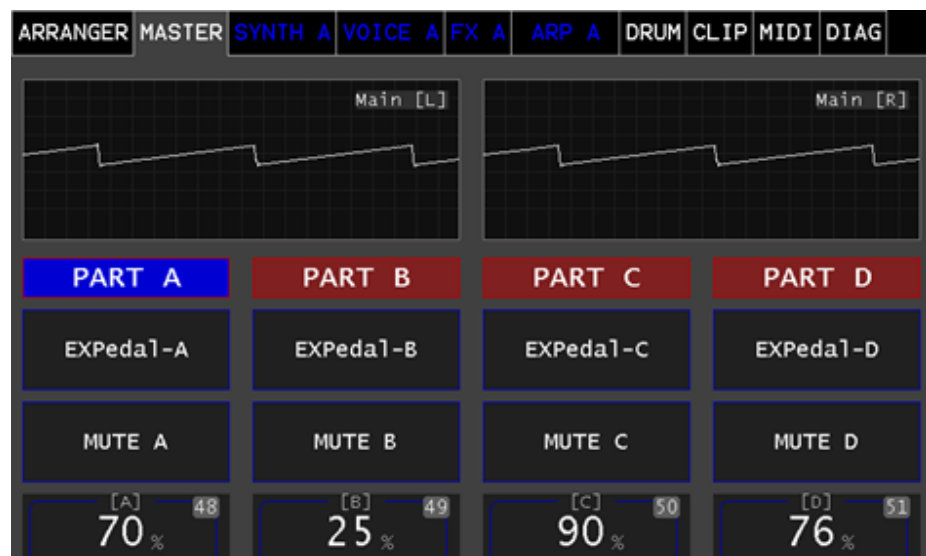
PART

Shows, with blue background, the part which is active in the menu and on the panel.

EXPedal

This touch button can be used to activate/deactivate an expression pedal for the corresponding PART (blue background indicates activated). When the EXPedal is activated, the volume can be controlled via the expression pedal. See Figure 4. [Connections]

MUTE

By means of this touch button the audio output of the corresponding PART can be switched on/off.

Clip-Launcher

The Clip Launcher, Menu Tab CLIP, is the central hub for performing live directly with the MD900.

The panel (see Figure 16. [CLIP-Launcher]) is used for navigation, to get into the details of a clip (OPEN), to add/delete clips and of course to activate clips.

Figure 16. [CLIP-Launcher]

Alternatively, clips can be operated via external controller (e.g. AKAI APCmini). Clips can be activated/deactivated via this controller. Navigation must still be done via the touch screen.

TRACK

The tracks are the columns PART A-D, DRUM, TRACK 6,7 and are permanently linked to the respective instrument(s).

PART A-D corresponds to SYNTH A-D, DRUM corresponds to the drum sample player, TRACKS 6,7 are intended for the control of external sound generators in the future.

CLIP

The so-called CLIPs can now be inserted in the rows. For the tracks PART A-D the CLIP can be either an arpeggiator (blue background) or a MIDI track (brown background). For the track DRUM it is a GRID.

OPEN

This touch button can be used to distinguish between clip start and clip open. If the OPEN button has a blue background, the "MIDI Grid", the "Arpeggiator" or the "Drum Pattern" is opened.

> (i) Info: Selecting one of the above operations suppresses the OPEN function until the operation is set to "-" again.

TAKE-OVER

This parameter determines the number of measures (bars) until a selected clip is started/taken over.

TEMPO

This label determines the beats per minute (BPM) and generates the MD900-wide internal beat.

OPERATION

By means of this label one of the following operations can be selected, the execution is triggered by pressing the endless controller.

CreateARP: Creates an arpeggiator or drum CLIP

- CreateSEQ: Creates a sequencer CLIP (MIDI track)
- Copy: Copies a selected CLIP to the clipboard
- Paste: Copies from the clipboard to the selected CLIP
- Delete: Delete the selected CLIP

First, an operation is selected, then the corresponding CLIP field is selected, and finally the operation is executed by pressing the Encoder knob.

NAME

This label can be used to name a CLIP from a predefined list of names. Select the name with the Encoder, then select the CLIP field and confirm with the Encoder button.

> (i) Info: If a name is selected before confirming a Create operation, it will be applied when confirming the operation.

MIDI-Sequencer

The MIDI sequencer is opened by activating the OPEN touch button and selecting the corresponding clip in the launcher. The last opened MIDI sequencer can always be opened again in the main menu tab SEQ A (B, C, D).

If no MIDI data is loaded, an empty window opens in the GRID tab. We now select the MIDI FILE tab.
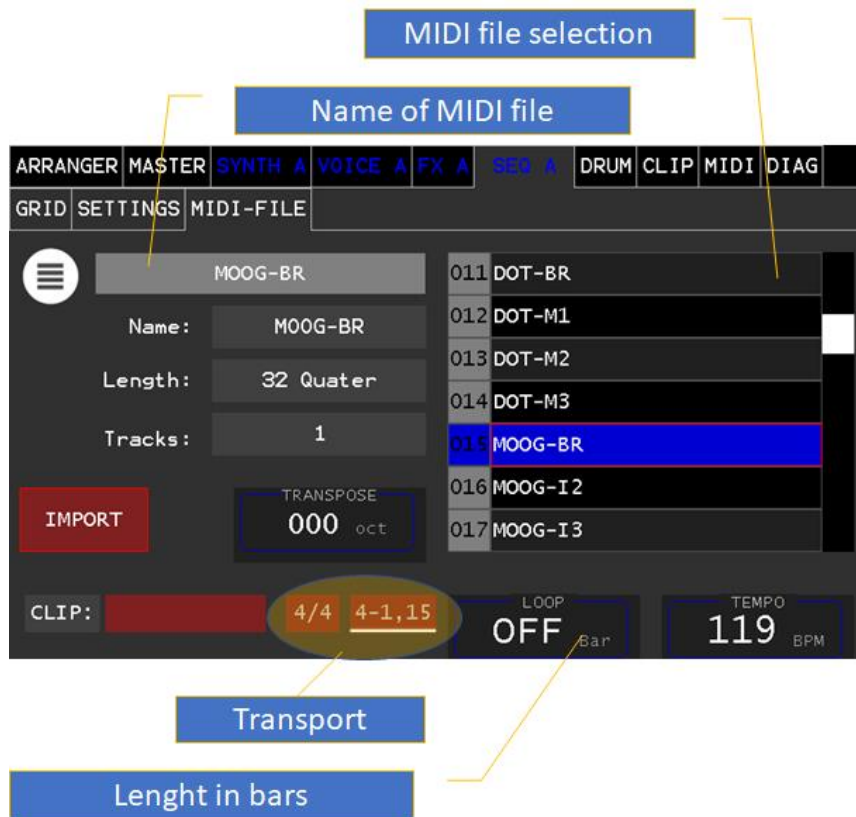

Figure 17. [MIDI-FILE]

The MIDI file selection list shows all files that have been loaded into the MD900 file system (see Data Import/Export manual). The length of the MIDI file is in quarter notes and is not automatically the end for the repeat (see LOOP).

TRANSPOSE
Allows to transpose up to 3+ octaves when importing

IMPORT
This touch button performs the import of the selected standard MIDI file (.mid) into the CLIP. The name from the MIDI file (not the file name) is taken as the clip name.

> Info: Midi files (.mid) for import can be loaded into the MD900 by the user.
>
> (see **md900-backup-restore-en.pdf**)

LOOP
This parameter specifies the length in bars (BARs) where the repetition takes place.

This should be an integer multiple of the TAKE-OVER bar (BAR) set in the Clip Launcher.

TEMPO
Determines the beats per minute (BPM)

MIDI Grid

In this view the MIDI events are displayed with the note values. With the help of the selection wheel the section can be enlarged or reduced.

On the touch display the range can be selected by holding and moving. Both in the time level and in the pitch level.
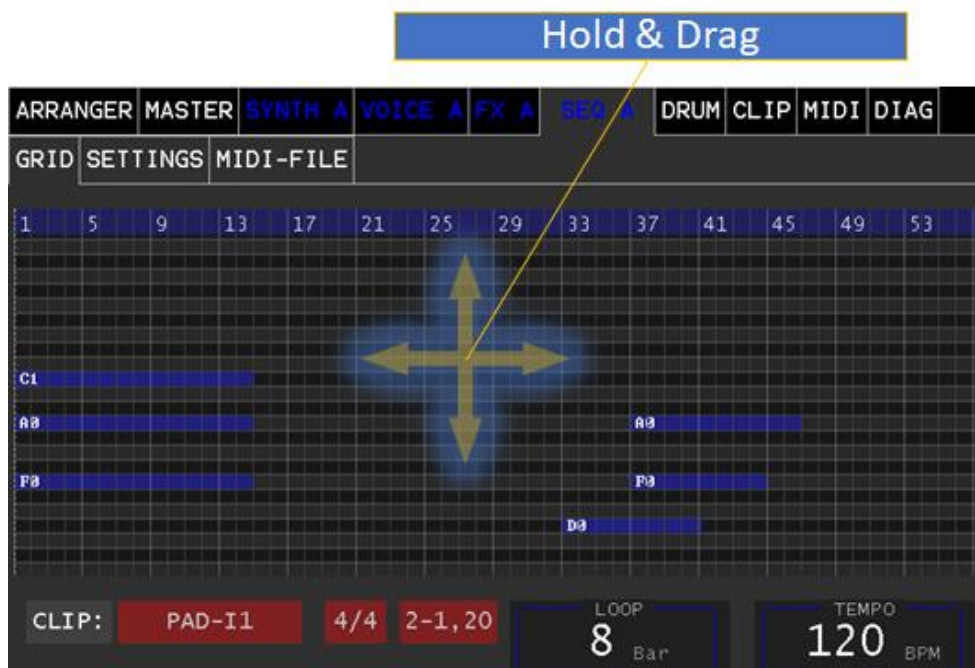
> (i) Info: The MIDI-Grid is a pure display and it can not be edited

> (i) Info: The MIDI sequencer has only a playback function in the current XVAOS version.

Figure 18. [MIDI-GRID]

If an active clip is opened and displayed in the grid, the current position is visualized by a cursor.

ARPEGGIATOR

The arpeggiator is opened by activating the OPEN touch button and then selecting the corresponding clip in the launcher. The last opened arpeggiator can always be opened again in the main menu tab ARP A (B, C, D).
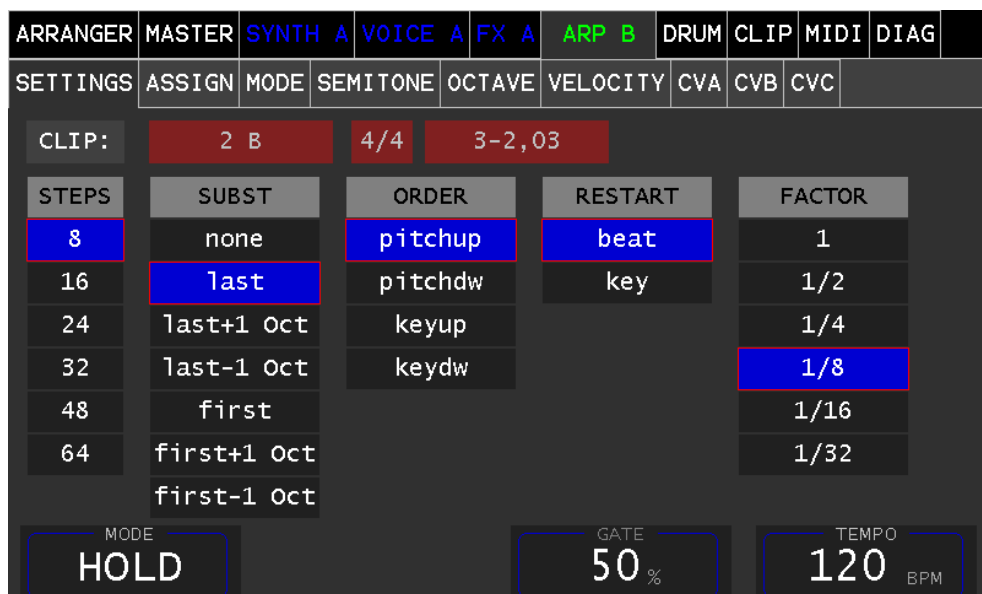

Figure 19. [ARP-SETTINGS]

SETTINGS

This dialog allows to set the operating modes.

- STEPS: Sets the number of steps until repetition

- SUBST: Determines which of the keys will be played as a substitute.
  - **none**: No play
  - **last**: The last key played
  - **last+1 Oct**: The last key played increased by 1 octave
  - **last-1 Oct:** The last key played decreased by 1 octave
  - **first:** The first key played
  - **first+1 Oct**: The first key played increased by 1 octave
  - **first-1 Oct:** The first key struck decreased by 1 octave
- ORDER: Sets the order in which the struck keys are sorted (K1-K5
  - **pitchup**: Pitch ascending
  - **pitchdw**: Pitch in descending order
  - **keyup**: In the struck ascending order
  - **keydw**: In the struck descending order
- RESTART: Acceptance of the new keys
  - **beat**: In step
  - **key**: On keystroke

- FACTOR: Sets the beat ratio between BPM beat and steps (steps)**1** = All 4 Beats
  - o **1/2** = All 2 Beats
  - o **1/4** = All Beats
  - o **1/8** = 2 times pro Beat
  - o **1/16**= 4 times pro Beat
  - o **1/32**= 8 times pro Beat

ASSIGN

This menu tab now sets the note, which was determined by the operation-dependent sorting of the keys, opposite the corresponding step (K1, K2, K3, K4, K5).
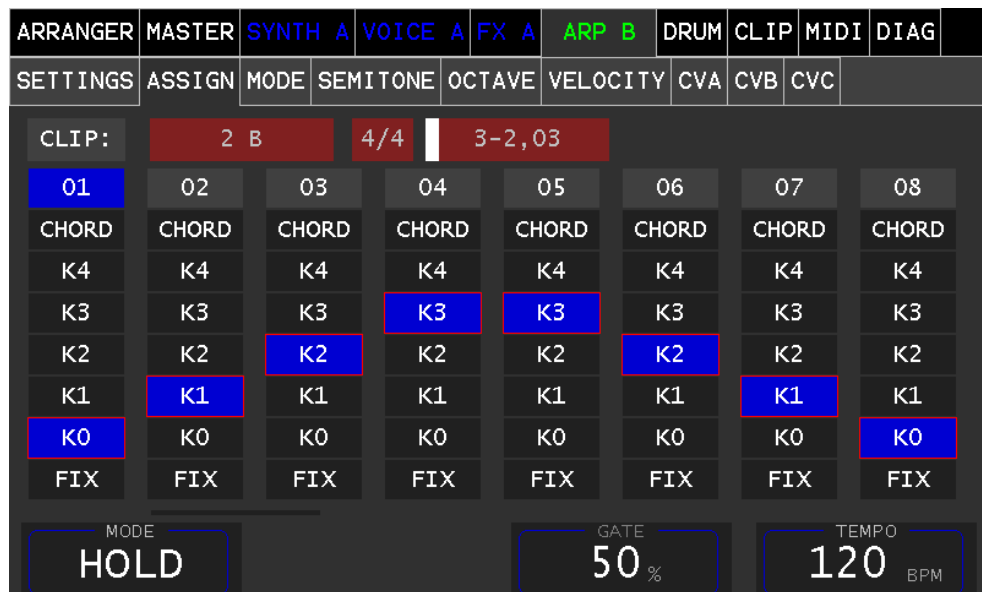

Figure 21. [ARP-ASSIGN]

If not all keys are played, notes are played as substitutes according to the settings (Substitute).

CHORD plays all played notes on this step.

FIX (is for future extension).

Figure 20. [ARP-MODE]

MODE

This menu tab defines the Step Mode.
OFF: No note is played in this step
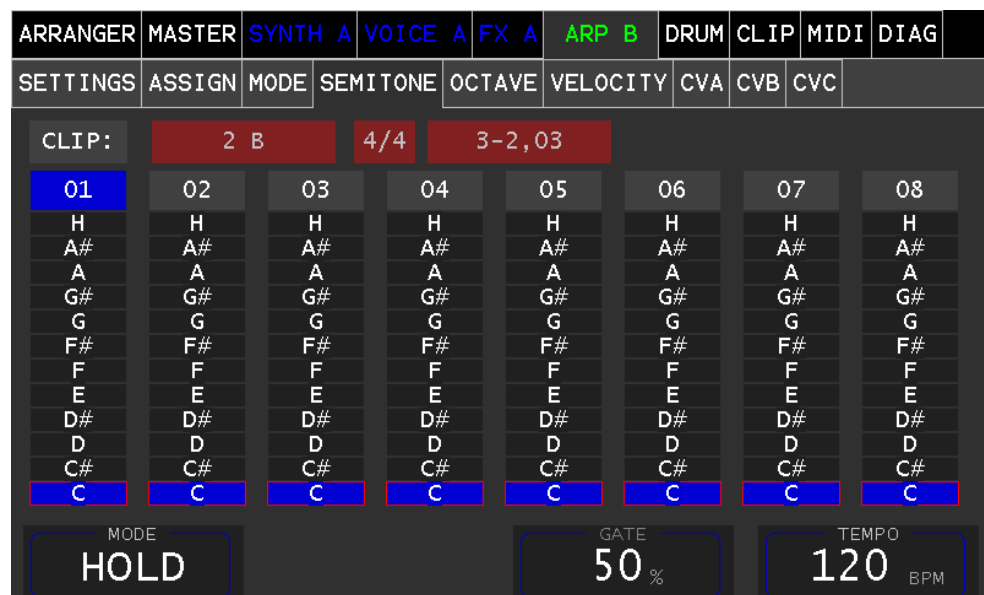
ON: In this step the note is played

HLD: (Hold) extends the note from the previous step

LEG: (Legato) only the pitch of the step will be taken over and there will be no new test stop

SEMITONE

This menu tab allows you to transpose the note value upwards in semitone steps.

From C = 0 semitones (no transposition) to B = 11 semitones
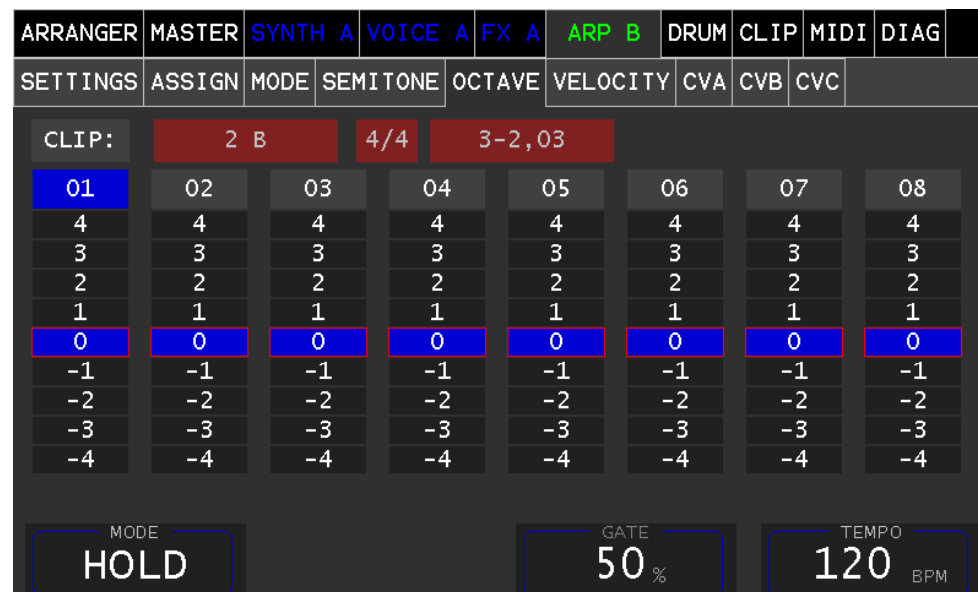
Figure 23. [ARP-SEMITONE]

OCTAVE

This menu tab allows transposition of the note value in octave up/down.

0 = corresponds to the note value of the step without transposition.

Figure 22. [ARP-OCTAVE]

ⓘ Info: The note played depends on the root note of the corresponding step.

VELOCITY

This menu tab sets the velocity value of the step with which the note is struck.
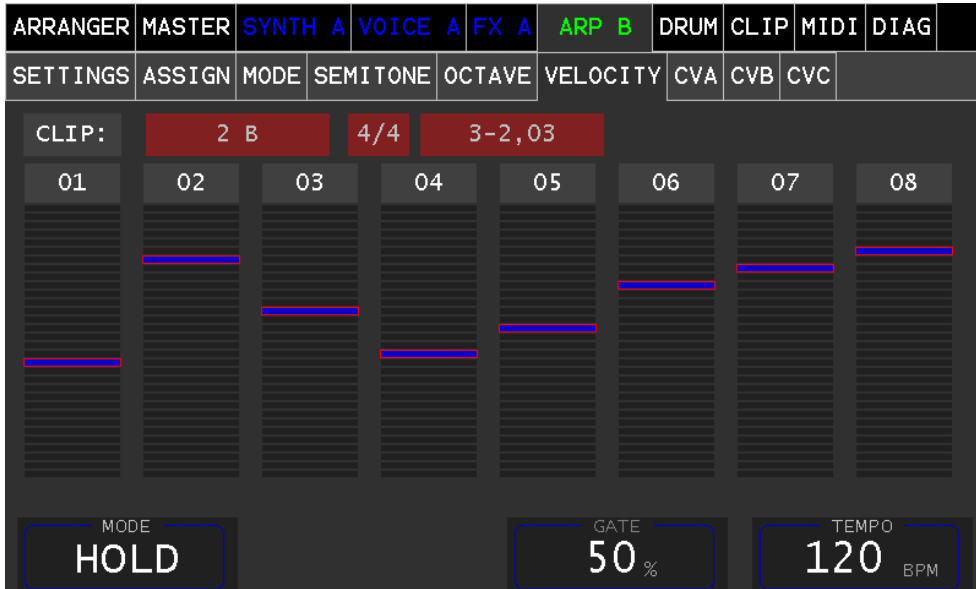
Figure 24. [ARP-VELOCITY]

ⓘ Info: The preset must have the velocity setting in the envelope generators (EGs) enabled (0-100%) to have any effect.

The MODE parameter can be set either to HOLD (to hold the pressed keys) or to ON (to stop the arpeggiator when the keys are released).

CVA (B, C)

This menu tab allows to send a kind of virtual control voltage to the corresponding synth engine.

This allows step specific modulations. These virtual control voltages are found with the same name in the modulation matrix as a source and can be switched there.

Figure 25. [ARP-CVA,B,C]

The **GATE** parameter sets the note ON/OFF ratio.

The **TEMPO** parameter sets the beats per minute (BPM).

DRUM-Pattern

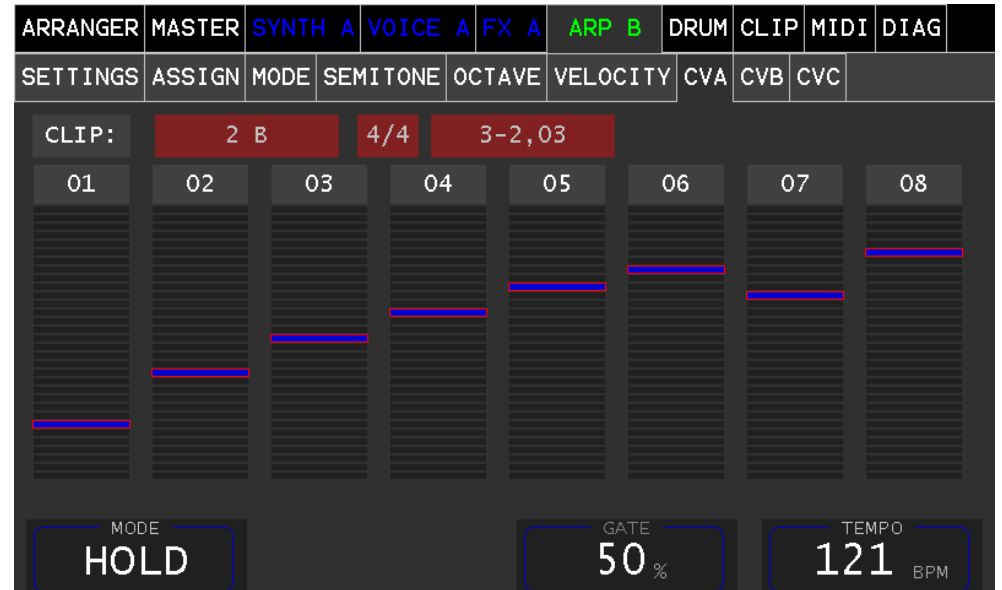The DRUM Pattern Editor is opened by activating the **OPEN** touch button and then selecting the corresponding clip (Track DRUMS) in the Launcher. The last opened pattern can always be opened again in the main menu tab **DRUM** and sub menu tab **GRID**.
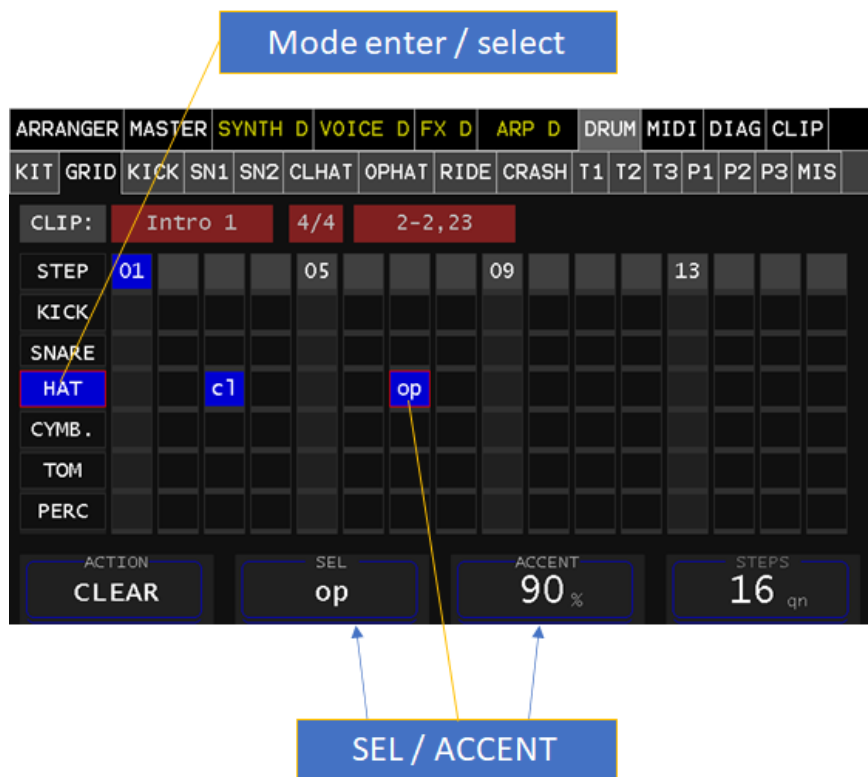

Figure 26. [DRUM-PATTERN]
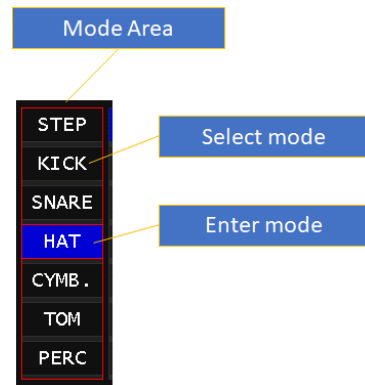
In the mode area, selecting the corresponding instrument row switches between input mode (highlighted in blue) and selection mode. By selecting 'STEP' the mode is changed for all instrument rows.

In the input mode, the instrument can be activated/deactivated at the corresponding step in the grid. The last selected grid field can now be assigned an alternative instrument with the SEL parameter. (e.g. clhat or ophat). Furthermore, the velocity can be adjusted from 0-100% with the parameter ACCENT. See Figure 26. [DRUM-PATTERN]

In the selection mode, a grid field can be selected without deactivating it. Thus, a change of the alternative instrument (SEL) or the ACCENT is possible.

With the help of the ACTION parameter it is possible to perform various actions (pressing the Encoder knob) on a whole row.

- CLEAR: Deletes the whole row
- MUTE: The whole row is set on/off silently
- SELECT: Selects the whole row
- SELECT: Selects the whole row

The STEPS parameter defines the number of steps until repetition. If more than 16 steps are set, the selection wheel can be used to switch to the next page(s).
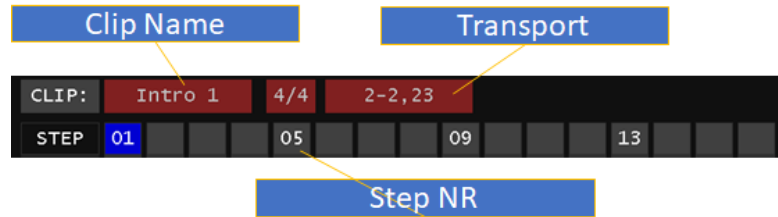
Pattern-Duplication

Once you have created a pattern page, it is easy to duplicate it. For example, increase the number of steps from 16 to 32, use the selection wheel to move to page 17-32, and then press the STEPS knob - the previous page 1-16 will be duplicated to page 17-32.

MIDI Settings

MIDI Devices

If a connected USB MIDI keyboard is to be used, the USB device must first be linked (mapped) to a MIDI port (P1-P4). This allows the assignment to a part (A-D).

In the default settings the DIN-MIDI In is assigned to P1. To assign the connected USB-MIDI device go to the tab MIDI-Devices see Figure 27. [DEVICES]
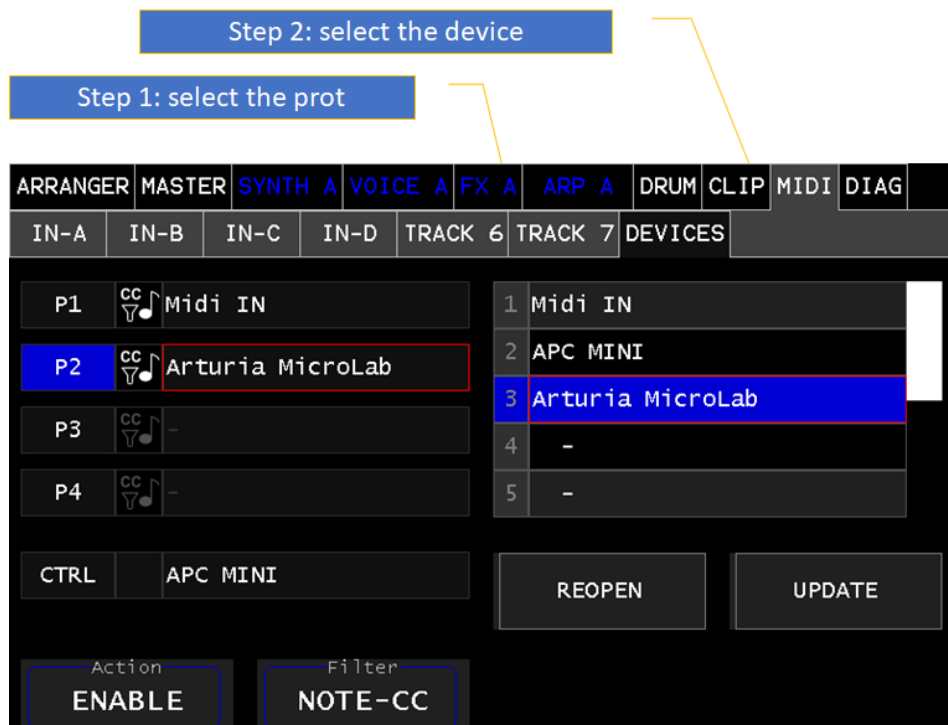
Figure 27. [DEVICES]

Pressing the UPDATE touch button updates the Devices list (right).

MIDI Inputs

In the MIDI tab the MIDI routing configuration will be setup. To assign a MIDI Input (Port & Channel) select one of the sub-tabs **IN-A, B, C, D, Track 6, Track 7.** Additional settings are adjustable for the MIDI Input in this view.
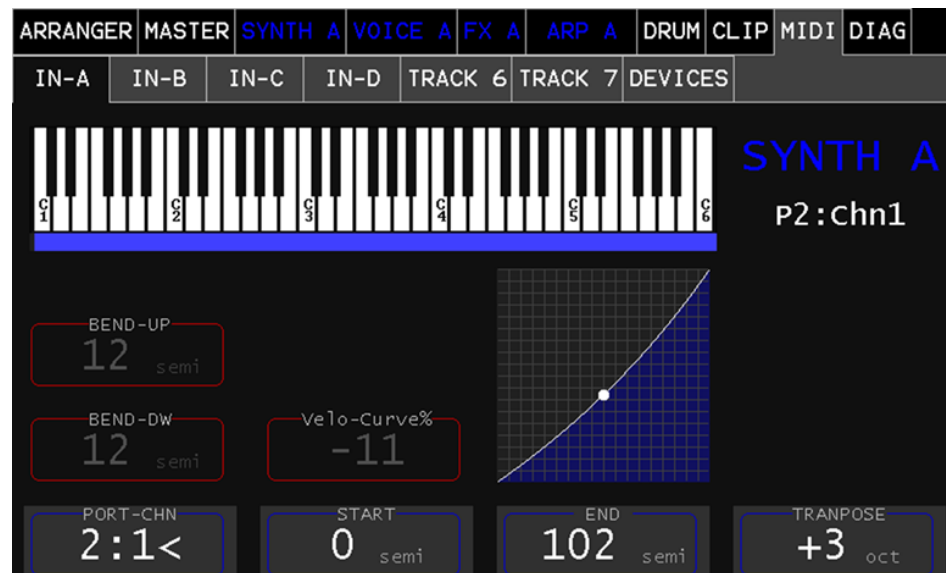
Figure 28. [MIDI-PART Input]
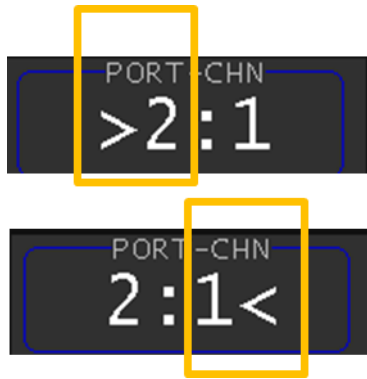
The LABEL: **PORT-CHN** allows the selection of the port (e.g. P2). Pressing the encoder key switches between port & channel. This is indicated by ">" or "<".

LABEL: **START**, **END** sets the active range where this part accepts note ON/OFF values (this is useful for splitting the keyboard)

LABEL: **TRANSPOSE** shifts octave-wise upwards

LABEL: **BEND-UP** sets the pitch bend range upwards in semitone steps

LABEL: **BEND-DW** sets the pitch bend range down in semitone steps

LABEL: **Velo-Curve** MIDI velocity correction curve

Voice structure

Figure 29. [Voice structure]

The voice (synthesizer voice) *in* Figure 29. [Voice structure] with its sections (in the analog world modules) is responsible for the sound generation in the MD900.

The sonic character is largely determined by these sections, their capabilities, structure and modulation sources or destinations. The audio path is hardwired and fully stereo. The stereo path gives the MD900 its vivid spatial sound texture.

Special feature

The structure of the voice can be described as classic in principle - nevertheless it has special features.

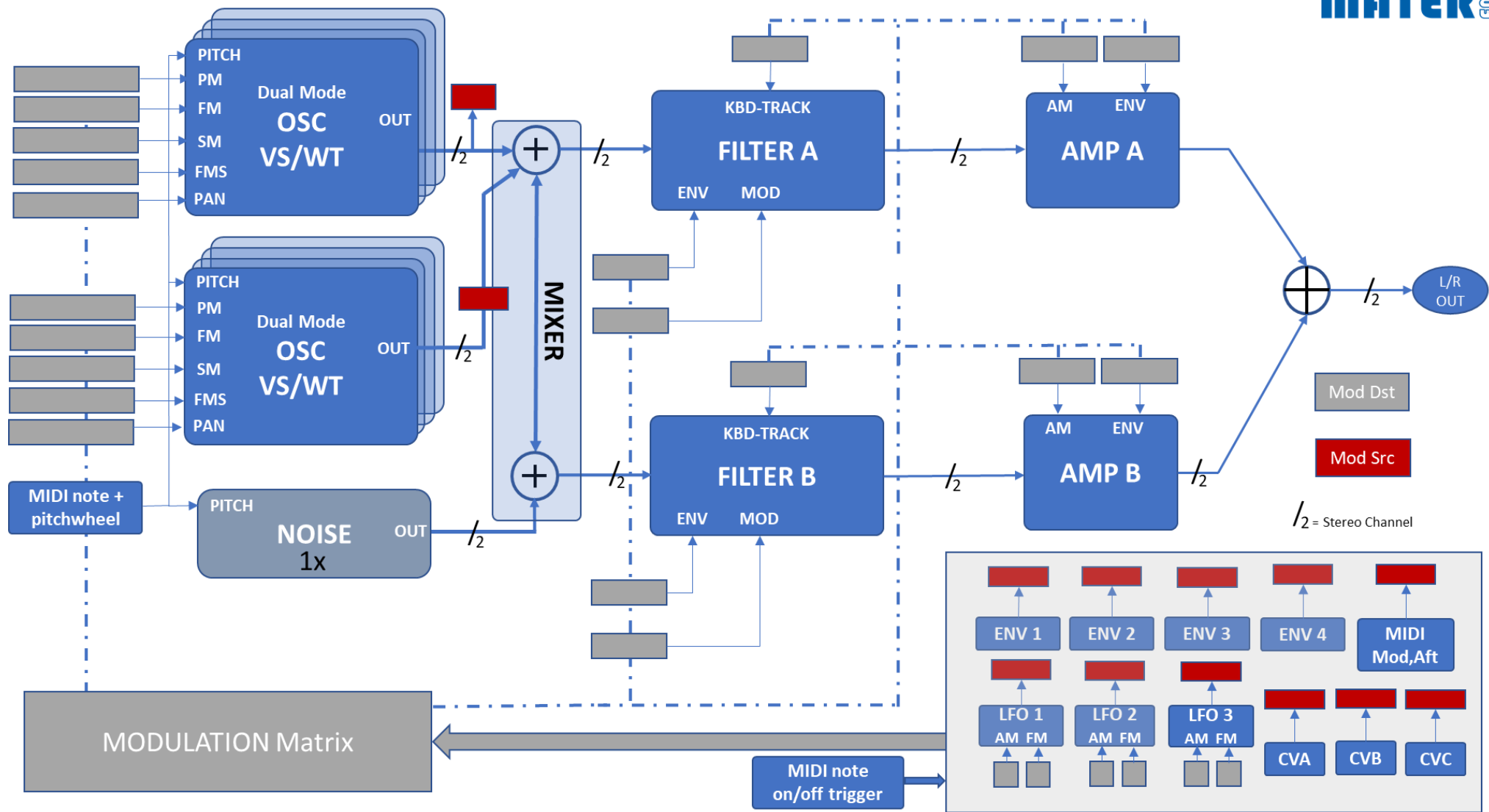On the one hand there are two paths with filter + amplifier. These are supplied by the mixer. The mixer also allows to selectively determine through which of the two filter paths the oscillators 1, 2 and noise are to be fed. Especially with the possibilities of the wavetable or algorithm oscillators, the sound design can already be very complex by using these oscillators in conjunction with the multimode filters.

On the other hand there are plenty of modulation sources. Together with the two filter paths and the extensive modulation possibilities of the oscillators, these allow the greatest possible movement (motion) in the sound.

Voice- shutdown

In principle, the MD900 has a total polyphony of 16 voices (synthesizer voices). If very complex sounds are loaded through a preset and the demand on the computing power is not available, the MD900 automatically switches off voices in pairs. On the one hand, this makes very complex presets possible, but on the other hand it leads to a loss of voices.

This procedure enables stable signal processing.

> ⓘ Info: By reloading a preset, the voices are added again, provided that the required processing power is available.
>
> A maximum of 4 voices are deactivated.

Unisono detune:

With the parameter **DETUNE** a mutual detuning of the assigned voices in cent [+/-100] can be done (UNI2,3,4). The cent value is divided depending on how many voices are assigned.

> (i) Info: The DETUNE parameter can also be set on the panel. See Figure 1. [Front panel] ⓫

Glide

The Glide function can be performed by two operating modes.

The TIME mode controls the gliding increase/decrease of the pitch by the set time parameter TIME (s) independent of the distance of the played semitone jump.

The RATE mode controls this by a constant rate, which is set with the parameter RATE (%).

> (i) Info: On the PANEL the parameters TIME or RATE can be set by means of the GLIDE controller. It controls TIME or RATE depending on the operating mode. See Figure 1. [Front panel] ⓫

KBD-Mode

The KBD-MODE parameter allows to set the articulation behavior in the MONO voice mode

- **NORM**: The EGs (envelope generators) are triggered with every keystroke, regardless of whether legato or staccato is played.
- **LEGATO:** If legato is played, only the pitch is taken over. The EGs are not triggered. With staccato, the EGs are triggered when each key is played.
- **GLIDE_LEGATO**: Only with a legato playing mode the GLIDE takes place. The EGs are triggered as in LEGATO mode

VOICE A (B, C, D)

This colored main menu tab represents the **VOICE** view and serves as a clear navigation to the individual sections. By tapping on the corresponding section (module), you can access its user interface. With [**x**] or at the panel with **ESC** you return to the VOICE view.

Furthermore, it shows the voice allocation. The bar height is proportional to the velocity value. By the identifier A, B, C, D the corresponding PART is displayed, by which this voice was requested. If the identifier is an (x) then this voice is deactivated, see Figure 30. [VOICE Overview]
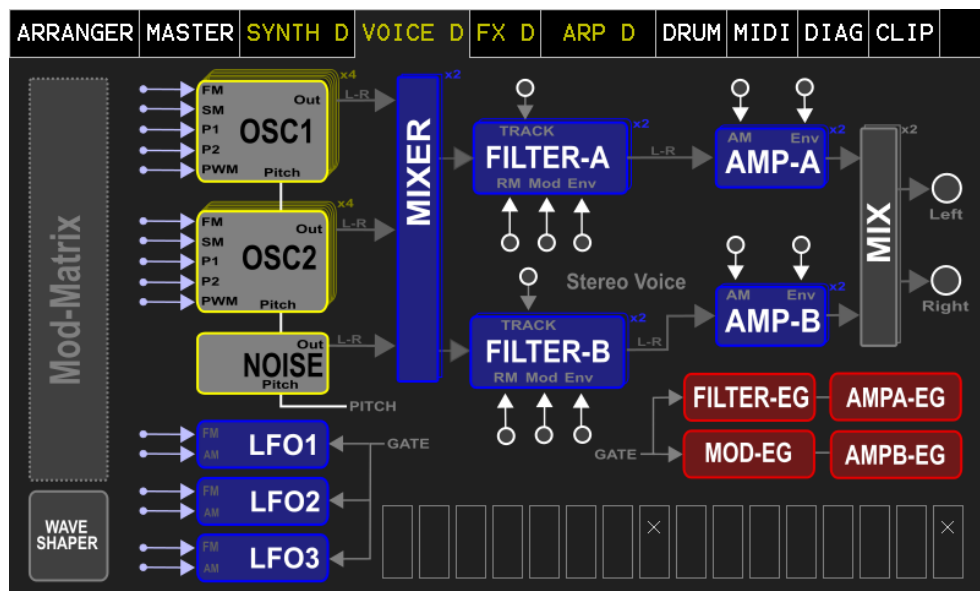
Info: On the panel it is possible to navigate directly to this menu via the PARTs with the keys A, B, C, D. According to the selected key. See Figure 1. [Front panel] ❽

Info: The VOICE button on the panel can be used to navigate directly to this menu. See Figure 1. [Front panel] ❾

Info: The focus button on the panel can be used to navigate directly to the corresponding section (module). See [Focus-keys]

Figure 30. [VOICE Overview]

OSCILLATOR Wavetable Mode

There are 2 oscillators which are completely identical. We describe **Oscillator 1** (short form OSC1) from **PART A**.

The mode is switched with the **SEL** button on the panel. In this case we select the wavetable mode.

Press and hold the **Unison** key to change Mute/Unmute.
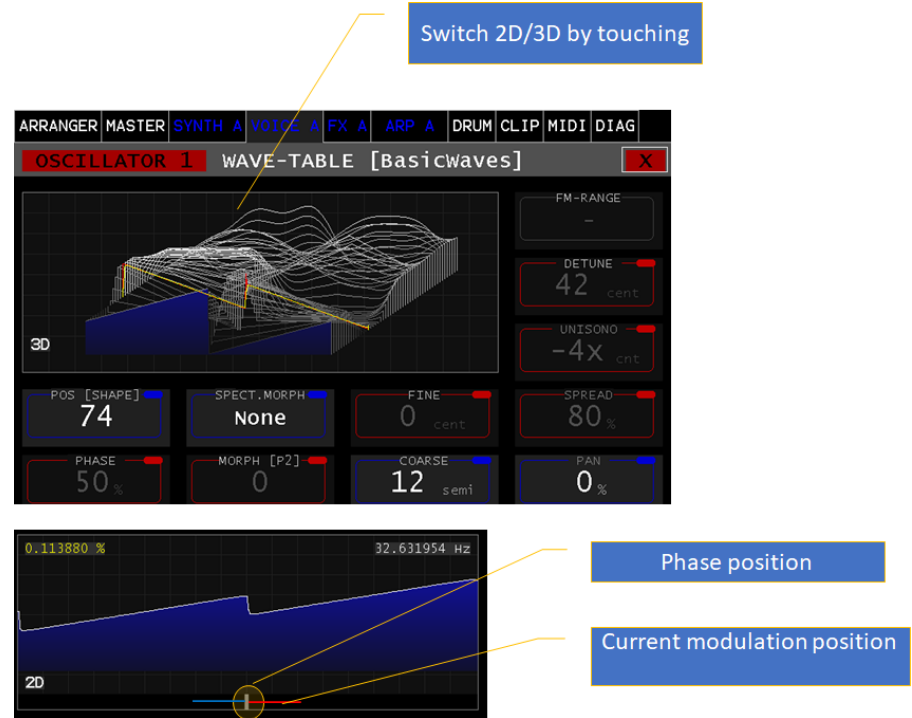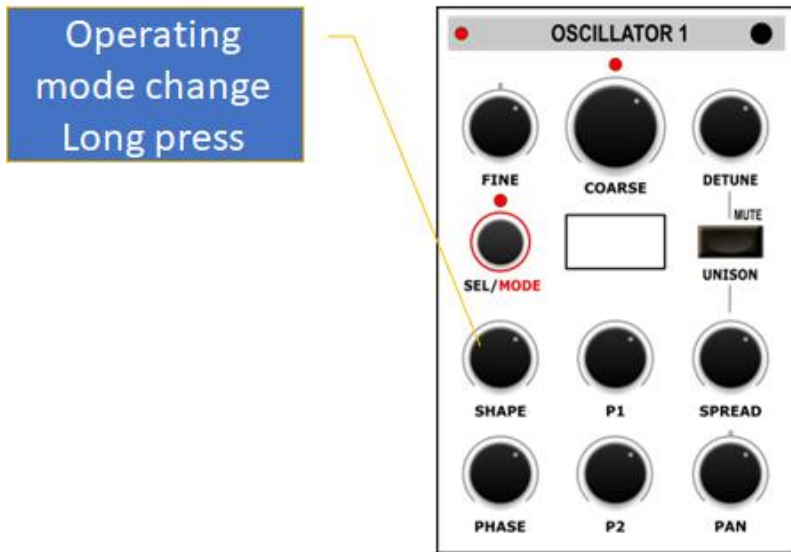
Figure 31. [WAVETABLE-OSCILLATOR]

Most parameters of the oscillator are accessible via the panel. The **Spect.Morph** parameter is only accessible via the touch display. The following is the oscillator view on the touch display. See Figure 31. [WAVETABLE-OSCILLATOR]

As shown in the figure, it is possible to switch between the 2D/3D view. In the 2D view, the phase position and the current phase position (modulation) are also displayed.

Info: Pressing the focus button (right top) brings the corresponding oscillator into the touch display.

Wavetable Selection

There are two different ways to select the wavetable. By turning the selection wheel, a preview of the wavetable (popup) appears and can be loaded in sequence by pressing the selection wheel.

On the panel, this can be done at any time by using the endless knob **SEL**. The selection is indicated by the wavetable name flashing and can be loaded by pressing if necessary. If the selection is not confirmed within 5 seconds, the flashing stops and the current wavetable name is displayed again.

> (i) Info: If wavetables are loaded with less than 256 waves, these are expanded to 256 when loading the wavetable (linear interpolation)

Parameter

The following is the list of oscillator parameters.

POS [SHAPE]: Position in the wavetable from 0- 256.this parameter is modulable.

PHASE: Phase position 0-100%

SPECT.MORPH: Selection of the spectral morphing algorithm. The frequency spectrum is changed by different variants. By changing the wavetable position and changing the morph depth parameter MORPH [P2] surprising textures are created.

- H-SHIFT: Shifts after the fundamental frequency parts of the spectrum to higher positions.
- IH STRETCH: Pulls apart frequency portions of the spectrum.
- SMEAR: Blurs frequency portions of the spectrum.
- LOW-PASS: Low pass filter in frequency spectrum.
- HP-PASS: High pass filter in frequency spectrum.

> (i) Info: Wavetable files (.wav) can be loaded into the MD900 by the user.
>
> (see **md900-backup-restore-en.pdf**)

MORPH [P2]

Depending on the MORPH algorithm set, the depth or the type is changed.

FINE

Base tone pitch Fine adjustment of the oscillator in +/-50 cents.

COARSE

Base pitch setting in semitone steps +/-24 semitones.

FM-RANGE

This parameter is foreseen in the future and is deactivated at the moment

DETUNE

This parameter detunes the other oscillators in UNISON mode to each other in cents. (0-200%) is the total detuning value and is divided according to the number of unison oscillators.

UNISONO

Unison mode expands the number (up to 4) of active oscillators (x2, x3, x4). At x1 and x5 this mode is inactive.

-2x, -x3, -x4 is almost the same as described above, but with the difference that every second unison oscillator is shifted down by 1 octave.

From a number of 2 unison oscillators the oscillator output signal is split into STEREO. With the DETUNE the total detuning is set Unison mode expands the number (up to 4) of active oscillators (x2, x3, x4). At x1 and x5 this mode is inactive.

SPREAD

Changes the stereo width of the oscillator output signal.

PAN

Changes the stereo panorama of the oscillator output signal +/-100% right/left.

OSCILLATOR Algorithm Mode

The "Algorithm" mode follows the typical virtual analog approach, but with the possibility not only to generate the classic waveforms (SAW, PULSE, TRI etc.), but also to generate waveforms with great variability by means of different algorithms.

Figure 32. [ALGORITHM-OSCILLATOR]

COMMON PARAMETERS:

The parameters **PHASE**, **FINE**, **COARS**, **DETUNE**, **UNISONO**, **SPREAD** and **PAN** are identical in both modes. See description [OSCILLATOR Wavetable Mode]

SHAPE &P2

These two parameters change the waveform depending on the selected algorithm. Parameter Range

Shape 0-256, P2 0-100%

Modulations

Most of the parameters are targets for modulation in the modulation matrix. They can be switched there with various sources. Exceptions are the enumerations like ALGORITHM, UNISON and SPECT.-MORPH. These are exclusively manually adjustable.

ALGORITHM

Is the selection of the algorithm for waveform generation.

- **Just SAW**: Creates a classic sawtooth waveform. SHAPE & P2 have no function here.
- **VA Sweep**
  Morph of: SIN->TRI (0.64), TRI->SAW (65-128), SAW->PULSE (128-192) PWM (192-256)

- **Dual PWM**
  Symmetrical 2-fold pulse wave, changes the width from the center SHAPE (0-256).

- **HSync SAW**
  2-fold sawtooth wave, SHAPE multiplies period SHAPE (0-256) relative to oscillator fundamental frequency.

- **PWM**
  Classic pulse width change 50-95% SHAPE (0-256)

- **Formant SIN**
  Formant sine: SHAPE (0.256) changes the carrier signal period, P2 (0-100%) changes the modulation period relative to the oscillator fundamental frequency

- **PD SIN**
  Phase Distortion (PD): Exponential distortion of the phase of a sine wave, SHAPE (0-256) defines the degree of distortion.

- **Fract PWM**
  Fractal pulse width change, proportionally multiplies the PULSE only in the positive pulse duration, a special type of pulse width change.

PANEL

The panel operation of the oscillator is identical to the value labels in terms of parameters and it can be set alternately on the main display or on the panel.

Switching the oscillator mode is done by long pressing the SEL/MODE endless control.

Long pressing of the UNISON key switches between mute/unmute, i.e. the oscillator is muted.

The octave LED indicates when the coarse pitch is on an octave.

Figure 33. [OSCILLATOR-PANEL]

The endless knob SEL allows the selection of a wavetable. When the knob is turned, the name of the wavetable starts blinking in the assistance display to indicate the selection process. If this selection is not confirmed within 4 seconds, the name jumps back to the currently loaded wavetable. However, if the

selection is confirmed beforehand by briefly pressing the Encoder, this selection will be loaded.

In ALG mode, the selected algorithm becomes active immediately.

NOISE

Noise actually means more the ambient noise than just noise. Noise is a sample-based oscillator (Wave Files).
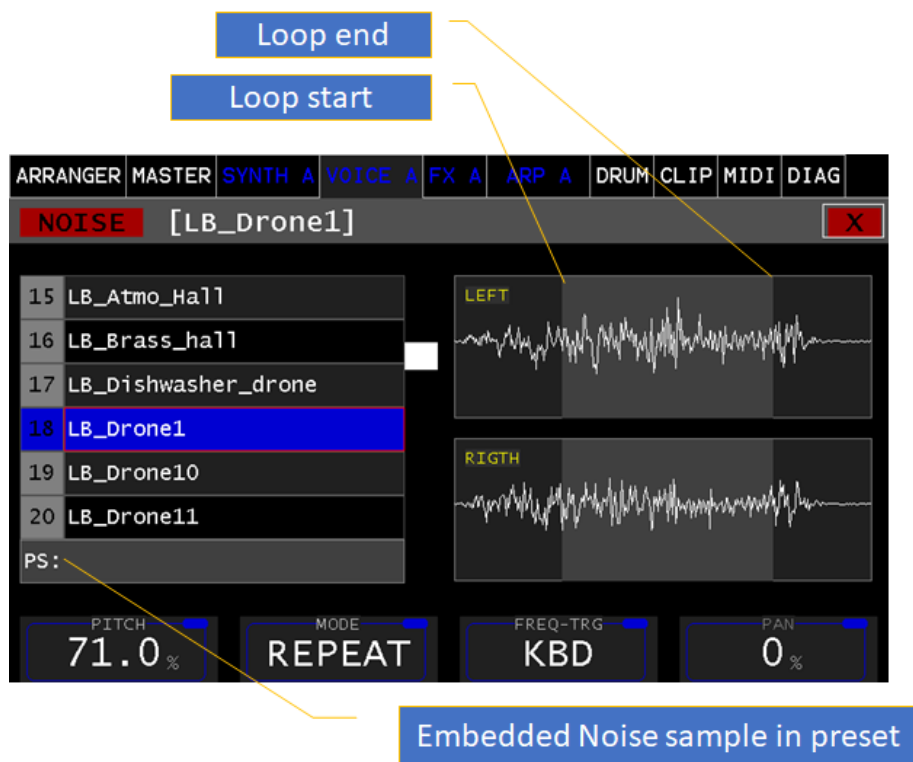

Figure 34. [NOISE-View]

The parameter **Pitch** can be used to change the fundamental frequency of the original sample (0-200%).

The **FREQ-TRG** parameter can be used to control **KBD** tonally, if desired. In the **MAN** position the frequency is constant.

MODE

The MODE parameter determines the playback behavior

- **REPEAT**: Repeats the whole sample.
- **TRANS**.: Transition is played only once.
- **LOOPED**: If loop markers are included in the sample (area highlighted in gray), the sample is repeated between Loop Start/End.
  If no loop markers are present, the entire sample is repeated.

PAN

By means of this parameter it is possible to shift the left/right part (+/- 0 to 100%).

PS

Basically, the wave sample files are located in the file system of the MD900. When a preset is saved, the sample content is also saved in the preset.

> ⚠ Attention: The embedded sample in the **PS**: field will be lost if a sample is selected from the list and this is saved

If presets are exchanged between different MD900s and the preset contains a sample that is not found on the MD900's file system, this name is displayed in the **PS**: field.

PANEL

The parameters PITCH, PAN, TRG, MODE can be operated in the same way on the panel.
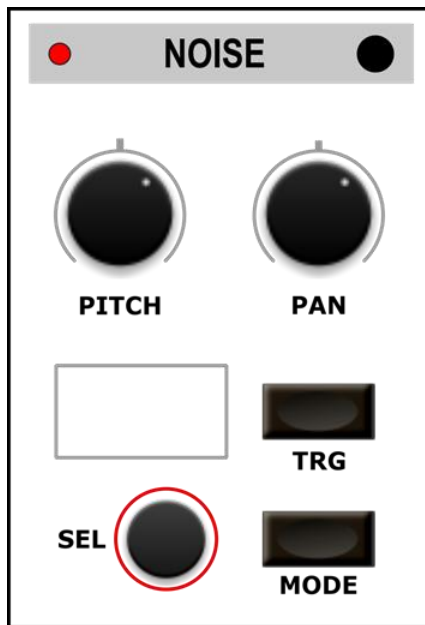

Figure 35. [NOISE-PANEL]

The **SEL** knob allows you to select a noise sample. When this knob is turned, the name starts blinking in the assistance display to indicate the selection process. If this selection is not confirmed within 4 seconds, the name jumps back to the currently loaded noise sample. However, if the selection is

confirmed beforehand by briefly pressing the Encoder, this selection will be loaded.

> (i) Info: Noise Sample Files (.wav) can be downloaded from users to be loaded into the MD900.
>
> (see **md900-backup-restore-de.pdf**)

SHAPER

Is not implemented in the current version and is reserved for future versions.

> ⚠ Attention: Please make sure that the SHAPER is not routed. These settings are stored in the preset. And can otherwise cause unintended sound changes in future versions.
>
> None of the INSERT LEDs on the SHAPER panel should be lit.

MIXER

This section is the mixer for the two oscillators (OSC) as well as for the noise OSC. Furthermore, the signal routing is done through which filter A, B path the signal is routed.
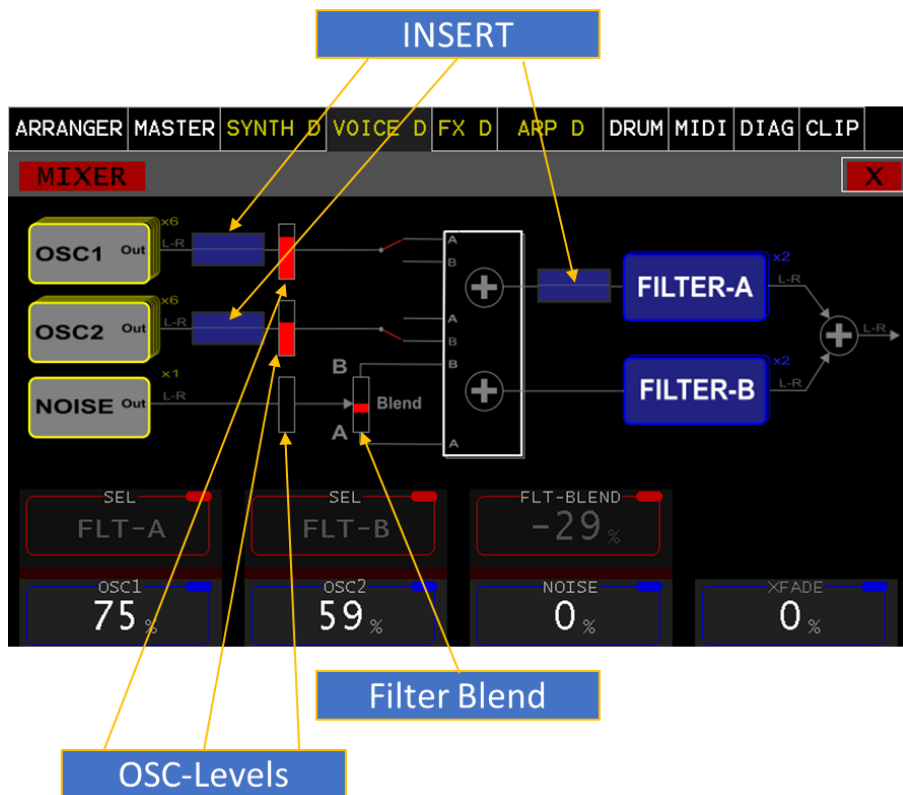

Figure 36. [MIXER]

The oscillator levels are visualized with the bar graphs. The routing switches visualize the signal path.

INSERT (reserved for future expansion)

SEL

With the two parameters SEL the signal path of the respective

OSC can be defined. The SEL of the FLT-A path additionally allows a crossfade XFADE between the OSC 1,2 exclusively through filter A. (Is also available as destination in the modulation matrix).
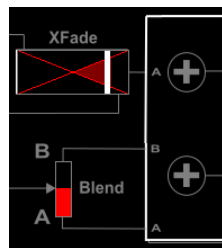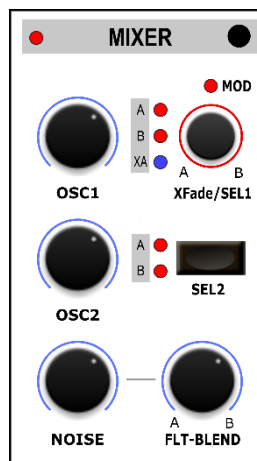
FLT-Blend

This parameter allows smooth crossfading between the two filters A, B paths.

OSC1, OSC2, NOISE

These parameters set the signal volume of the corresponding oscillators.

PANEL

At the panel the oscillator levels, the routing or filter-blend can

be set in the same way and with the same name. The XFADE is designed as an endless control. Switching is done by pressing the endless control SEL1.

The controls OSC1, OSC2, NOISE regulate, as already described, the volume and are also indicated in the assistance display.

FLT blend as well. SEL2 Routed the OSC2 selectively by FILTER A, B

FILTER A(B)

The filter section is explained here as a substitute for the FILTER B. The LINK function is only available for FILTER A. Both the FILTER A and the FILTER B are designed in stereo.
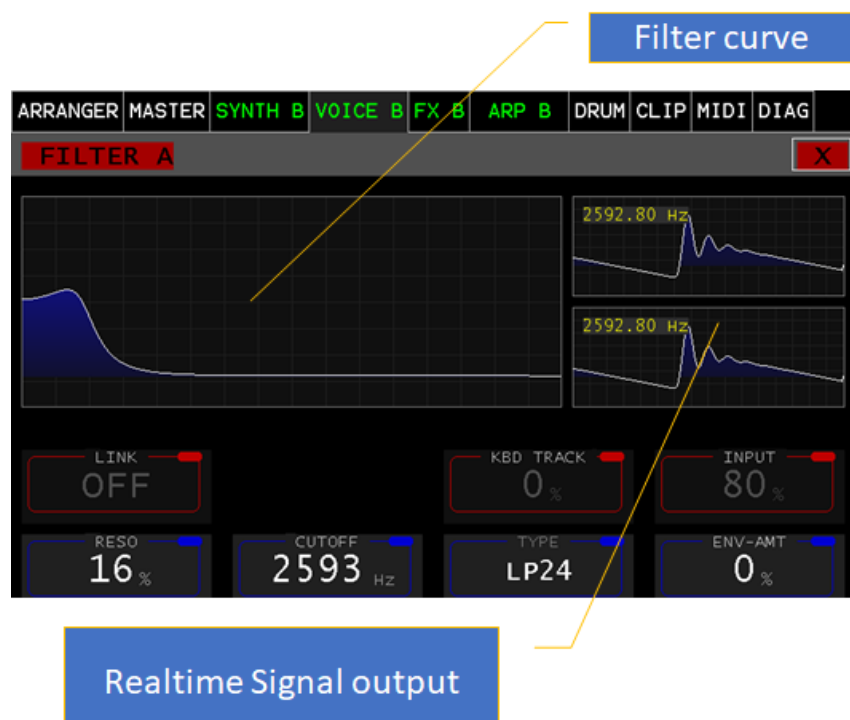

Figure 37. [FILTER A]

The filter curve (filter step response) visualizes the characteristic of the filter depending on the settings like **CUTOFF**, **RESO**, **TYPE**. The real-time display (oscilloscope) visualizes the signal output of the filter for right/left respectively.

INPUT

This parameter allows attenuating the input signal into the FILTER. (0-100%)

CUTOFF

This parameter sets the cutoff frequency of the filter. (50Hz - 17200Hz) Short press of the Encoder knob toggles between fine and coarse frequency setting.

RESO

The Resonance parameter sets the amount of feedback (0-100%). Depending on the filter type it can lead to self-resonance.

KBD-TRACK

This parameter shifts more or less the cutoff frequency depending on the set value (0-100%), depending on the played note pitch.

ENV-AMT

This parameter sets the amount of cutoff shift by the ENVELOPE signal (0-100%).

LINK

If the LINK is activated, the cutoff frequency of FILTER B is set to the same value as FILTER A. All other parameters of FILTER B remain individual.

TYPE

The filter type or filter model can be set with this parameter.
The following filter types are available for selection:

- **LP24**: Stereo Butterworth low pass Filter 24dB
- **MOOG LD12**: Moog-style Transistor Ladder low pass 12dB
- **MOOG LD24**: Moog-style Transistor Ladder low pass 24dB
- **MOOGVCF_LP**: Moog-style VCF low pass 12dB
- **MOOGVCF_BP**: Moog-style VCF band pass 12dB
- **MOOGVCF_HP**: Moog-style VCF high pass 12dB
- **SEM_LP12**: Curtis-Style low pass 12dB
- **SEM_BP12**: Curtis-Style band pass 12dB
- **SEM_HP12**: Curtis-Style high pass 12dB
- **SEM_NS12**: Curtis-Style notch 12dB

Figure 38. [FILTER PANEL]

PANEL

The filter can be operated from the panel with the most important parameters: **CUTOFF**, **RESO**, **TYPE**.

Changing the **ENV-AMT** (Envelope Amount) can be done by holding down the TYPE button while turning the **CUTOFF** knob. The "Filter active LED" will start flashing to indicate that the **ENV-AMT** is being changed. After releasing the LED will just light again.
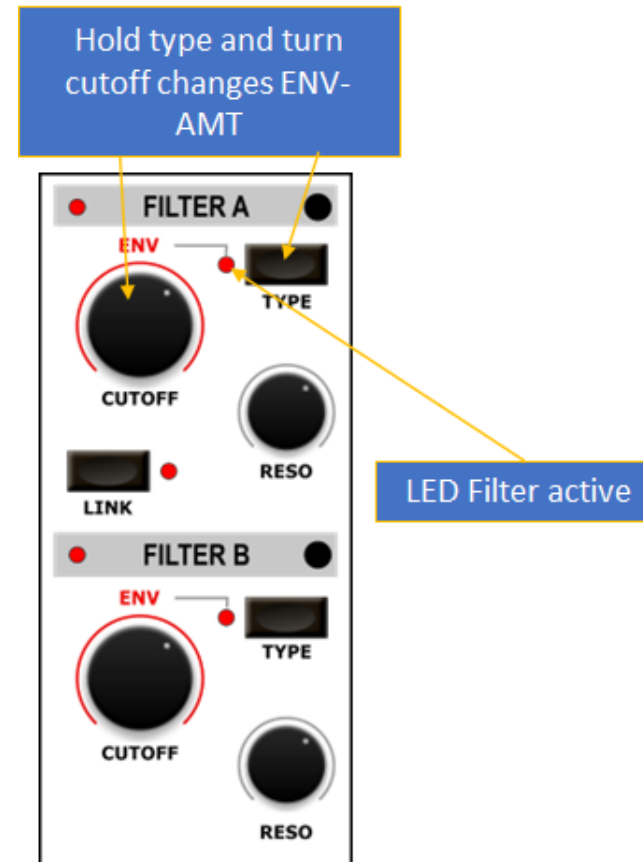
LFO 1(2,3)

The LFO Low Frequency Oscillator is an indispensable helper in the matter of modulation. The 3 x LFOs are explained on the basis of LFO 1. They are completely identical in operation. It should only be noted that LFO 3 is calculated only 375 times per second. It should therefore be used for really slow modulations. On the other hand, the LF0 1, 2 are calculated in the audio rate, 48000 times per second.
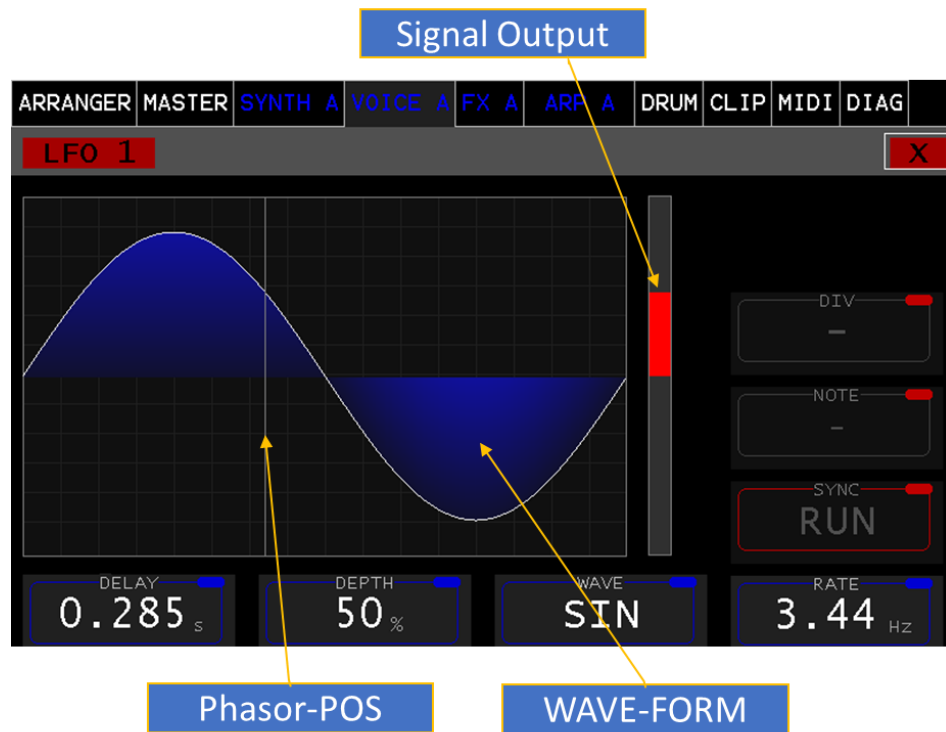

Figure 39. [LFO 1]

DELAY

This parameter allows to delay the LFO output signal (0.008s - 45s).

DEPTH

The signal depth of the output signal (0-100%).

SYNC

The SYNC parameter defines the operating mode or synchronization. The following operating modes are available:

- **RUN**: Continuous generation of the output signal
- **KBD**: With each new note played, the phase is reset.
- **BPM:** Is in phase with the song position and BPM (Beat per Minute), depending on the settings of **DIV, NOTE**
- **K&B:** Synchronous like BPM, with new stop the phase is reset

RATE

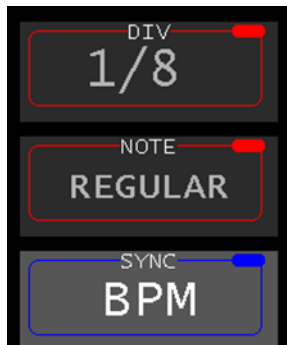In SYNC: RUN, KBD mode this VALUE defines the frequency in HZ (0.14Hz - 217.4Hz)

DIV

Sets beats (quarter note) per synchronous measure:

1=4 QN, ½=2 QN, ¼=1 QN, 1/8=½ QN, 1/16=¼ QN, 1/32=1/8 QN

NOTE

Sets the factor how many LFO periods per synchronous clock:

- Triplet 3x
- Regular 2x
- Dotted 1x
- *Mod* Factor is controlled by modulation
  (0-32% Dotted, 33-66% Regular,67-100% Triplet)

PANEL

LFO panel operation is done in the same way, only the DIV and NOTE parameters cannot be controlled from the panel.

The selection of the waveform is done with the encoder **WAVE.**

By pressing the focus button, the corresponding LFO can be selected in the touch display.
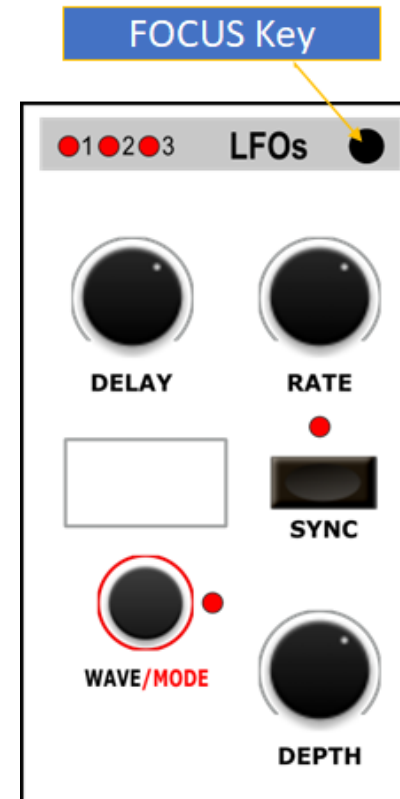

Figure 40. [LFOs PANEL]

ENVELOPE GENERATORS

The four envelope generators (EG) are explained as representative for all of them, since they are completely identical.

The names have turned out differently for reasons of space, here a short reference.

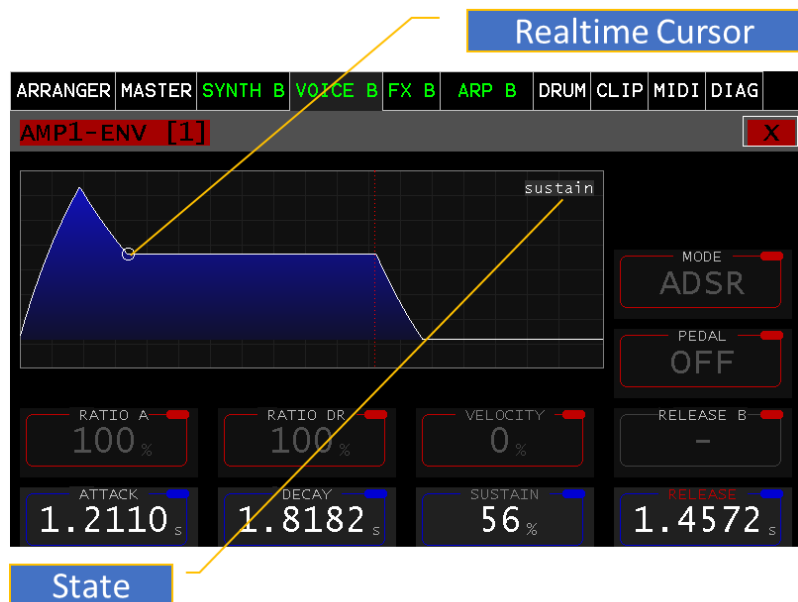| NR	PANEL	Modulations-Matrix	Default Routing
1	AMP-EG (A)	EG-A	Amplifier A
2	AMP-EG (B)	EG-B	Amplifier B
3	FILTER-EG	EG-FLT	Filter A,B
4	MOD-EG	EG-MOD	---

Figure 41. [EG]

The curve view shows the progression over time, based on the current settings. The release phase is shown from the dashed red line. If a sound is played, the cursor shows where the EG is located in the curve. The current envelope generator state is also displayed. See Figure 41. [EG]

> **Info:** The voice that was last assigned a new keystroke is visualized. It is recommended to always press the same key for a meaningful visualization.

ATTACK

This parameter sets the rise time (0.5ms - 32s).

DECAY

This parameter sets the fall time (0.5ms -32s) to sustain.

SUSTAIN

This parameter sets the hold value (0-100%) which is valid until the key is released again.

RELEASE

This parameter sets the fall time (0.5ms -32s) from the hold value (SUSTAIN) to the value 0.

RATIO A

With this parameter you can change the attack curve from exponential to almost linear (0- 100%).

RATIO DR

With this parameter you can adjust the two decay curves (Decay, Release) from exponential to almost linear (0- 100%).

Velocity

This parameter allows to make the envelope output signal dependent on the velocity (0-100%). Where the value 0 does not consider velocity and 100% affects the full velocity of the output.

MODE

This selection determines the operating mode of the EG. These are the following:

- ADSR: All 4 Phases (Standard Mode)
- AR: Attack & Release
- AD: Attack & Decay
- AD_LOOP similar to AD, repeats independently until released

PEDAL

If a sustain/hold pedal is connected, this parameter is set to "OFF" then everything works as described before.

SUSTAIN:

Selects between two release times. Release when the pedal is not pressed, Release B when the pedal is pressed.

HOLD:

If the pedal is pressed and then a key is released, the EG remains in the Sustain phase until the pedal is released. Then it changes to the release phase.

If these settings in the EG's

(AMP-EG, FILTER-EG, MOD-EG) are set differently, interesting effects can arise.
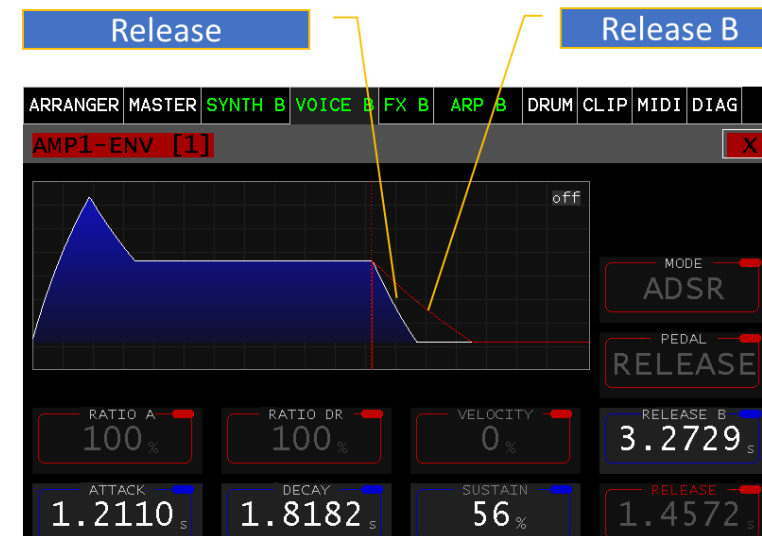

Figure 42. [Envelope View]

PANEL

The panel operation allows changing the four most important parameters (ATTACK, DECAY, SUSTAIN, RELEASE).

The control range is divided into two exponential curves.

The control travel (A, D, R): 0-50% corresponds to 0.5ms - 1s,
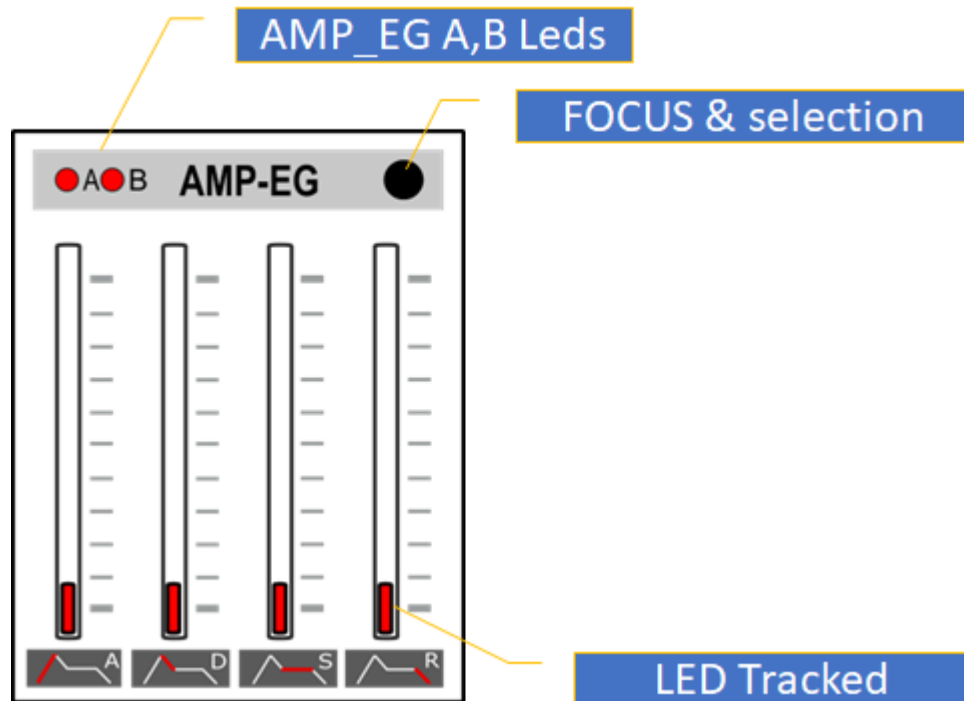
50-100% corresponds to 1s - 32s

Figure 43. [Envelope Panel]

FOCUS

Pressing the key also displays the EG in the main display. Pressing the key again toggles between the two AMP_EG A/B. If the focus is placed on a completely different section, the flashing continues to indicate to which of the two EGs the controls are assigned.

The value changes are shown in detail in the assistance display.

If the TRACKING function has been activated, some of the controller LEDs may not light up, while others do.

If a value is picked up, the "Tracked LED" lights up and the controller position is identical to the value. If it is not lit, the controller position is not identical with the value and can be fetched. This function prevents value jumps

> (i) Info: TRACKING is a useful function, especially for almost finished sounds where you want to have unintended adjustments and no value jumps when adjusting.

MODULATIONS – MATRIX

The modulation matrix allows the connection of signal sources with signal destinations. This is displayed in a list form.

With the scrollbar this list can be searched and the desired entry can be selected and changed. The changes are made as usual with the endless controllers.

Figure 44. [MODULATION]

DEFAULT

This touch button creates the first four basic entries.

CLEAR

Deletes a selected entry.

SRC

This parameter is used to select the source (SOURCE) of a selected entry.

AMOUNT

By means of this parameter the signal of the source, of a selected entry, can be attenuated or inverted. (+-0-100%) This is indicated by the bar in red/blue (blue inverted).

DST

By means of this parameter the signal destination (DESTINATION) of a selected entry can be selected.

SIGNAL-SUMMING

If different signal sources are assigned to the same signal destination, these signals are added up. They are automatically grouped and displayed with lowercase letters in the "+" column (a-z). This gives a good overview of these multiple assignments.

SIGNAL-ANIMATION

The current target signal is displayed in the AMT column above the Amount bar. This display is in real time. Fast signals cannot be visualized completely.

PANEL

It is also possible to make assignments in the modulation matrix via the panel. To do this, select a section (e.g. LFO), select the desired LFO no. 1,2,3 as usual with the focus button and then hold down the focus button until it starts to flash. The view of the modulation matrix appears in the main display and the source has already been entered in a free slot of the matrix. As long as the focus button is flashing, all controllers that come into question as a target take over the assignment. The parameter acts as an amount value input. Pressing the focus button again ends this assignment mode.

SOURCE References:

1	EG-A.CV	AMP Envelope Generator A out	0 to100%
2	EG-B.CV	AMP Envelope Generator B out	0 to 100%
3	EG-FLT.CV	FILTER Envelope Generator out	0 to 100%
4	EG-MOD.CV	MOD Envelope Generator out	0 to 100%
5	LFO1.OUT	LFO 1 out	+-100%
6	LFO2.OUT	LFO 2 out	+-100%
7	LFO3.OUT	LFO 3 out (375 Hz Rate)	+-100%
8	FLTA.OUT	FILTER A Signal out	+-100%
9	FLTB.OUT	FILTER B Signal out	+-100%

10	CVA	Control Voltage A (Arpeggiator)	0 to 100%
11	CVB	Control Voltage B (Arpeggiator)	0 to 100%
12	CVC	Control Voltage C (Arpeggiator)	0 to 100%
13	MIDI.VEL	MIDI Velocity (0 - 127)	0 to 100%
14	MIDI.AFT	MIDI Aftertouch (0 -127)	
15	MIDI.MOD	MIDI Modulation Wheel (0-127)	
16	FIX	Signal 100%	
17	MIDI.NOTE	*MIDI Note (0-127)	+-100%
18	RANDOM	*Note On Random	0 to 100%
19	MACRO 1	Macro 1 Value	+-100%
20	MACRO 2	Macro 2 Value	+-100%
21	MACRO 3	Macro 3 Value	+-100%

DESTINATION References:

1	OSC1.FM	Common OSC 1 Frequency Modulation	+-100%
2	OSC1.SHAPE	Common OSC 1 Shape Modulation	0-255
3	OSC1.DTUNE	Common OSC 1 Unison detune	+-100%
4	OSC1.PAN	Common OSC 1 Panorama	+-100%
5	OSC1.PM	Common OSC 1 Phase Modulation	+-100%
6	OSC1.P1	Common OSC 1 P1	+-100%
7	WTOSC1.MPH	WaveTable OSC 1 spectral morph	+-100%
8	ALGOSC1.P2	Algorithm OSC 1 P2	+-100%
9	OSC2.FM	Common OSC 2 Frequency Modulation	+-100%
10	OSC2.SHAPE	Common OSC 2 Shape Modulation	0-255
11	OSC2.DTUNE	Common OSC 2 Unison detune	+-100%
12	OSC2.PAN	Common OSC 2 Panorama	+-100%
13	OSC2.PM	Common OSC 2 Phase Modulation	+-100%
14	OSC2.P1	Common OSC 2 P1	+-100%
15	WTOSC2.MPH	WaveTable OSC 2 spectral morph	+-100%
16	ALGOSC2.P2	Algorithm OSC 2 P2	+-100%
17	FLT-A.MD	Filter A Modulation	+-100%

18	FLT-A.ENV	Filter A Envelope	+-100%
19	FLT-B.MD	Filter B Modulation	+-100%
20	FLT-B.ENV	Filter B Envelope	+-100%
21	AMP-A.ENV	Amplifier A Envelope	0 - 100%
22	AMP-A.AM	*Amplifier A Modulation	0 - 100%
23	AMP-B.ENV	Amplifier B Envelope	0 - 100%
24	AMP-B.AM	*Amplifier B Modulation	0 - 100%
25	LFO1.AM	LFO 1 Amplitude Modulation	+-100%
26	LFO1.FM	LFO 1 Frequency Modulation	+-100%
27	LFO2.AM	LFO 2 Amplitude Modulation	+-100%
28	LFO2.FM	LFO 2 Frequency Modulation	+-100%
29	LFO3.AM	LFO 3 Amplitude Modulation	+-100%
30	LFO3.FM	LFO 3 Frequency Modulation	+-100%
31	XFADE-A	Cross Fade OSC1/OSC2 to Filter A	+-100%
32	OSC1.FMAMT	Common OSC1 FM Amount	0 – 100%
33	OSC2.FMAMT	Common OSC2 FM Amount	0 - 100%
34	OSC1.AMAMT	Common OSC1 AM Amount	0 - 100%
35	OSC2.AMAMT	Common OSC2 AM Amount	0 - 100%
36	OSC1.AM	Common OSC1 Amplitude Modulation	0 - 100%
37	OSC2.AM	Common OSC2 Amplitude Modulation	0 - 100%
38	EG-A.ATTACK	*Amplifier A Envelope attack time	+-100%
39	EG-A.DECAY	*Amplifier A Envelope decay time	+-100%
40	EG-B.ATTACK	*Amplifier B Envelope attack time	+-100%
41	EG-B.DECAY	*Amplifier B Envelope decay time	+-100%
42	EG-FLT.ATTACK	FILTER Envelope attack time	+-100%
43	EG-FLT.DECAY	FILTER Envelope decay time	+-100%
44	EG-MOD.ATTACK	MOD Envelope attack time	+-100%
45	EG-MOD.DECAY	MOD Envelope decay time	+-100%

*place holder for future version updates