Manual

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1 Welcome to REAKTOR PRISM

Thank you very much for purchasing REAKTOR PRISM and REAKTOR PRISM FX. On behalf of the entire NATIVE INSTRUMENTS team, we hope these products will truly inspire you.
On the voyage of sound exploration REAKTOR PRISM and REAKTOR PRISM FX utilize the latest REAKTOR technology and open the door to new sonic possibilities, presenting a very playable, responsive polyphonic synthesizer, and a unique effects processor. As you familiarize yourself with the fresh interface and Modal resonators, you will find aural pleasure as you unlock their potential. REAKTOR PRISM builds on the achievements of its sonic sibling REAKTOR SPARK and expands the initial concept to its full potential. The scope for new sounds and interesting effects is vast, so lock yourself away and experiment. Play REAKTOR PRISM!

Manual Conventions

This manual uses particular formatting to point out special facts and to warn you of potential issues. The icons introducing the following notes let you see what kind of information is to be expected:

Whenever this exclamation mark icon appears, you should read the corresponding note carefully and follow the instructions and hints given there if applicable.

This lightbulb icon indicates that a note contains useful extra information. This information may often help you to solve a task more efficiently, but does not necessarily apply to the setup or operating system you are using; however, it's always worth a look.

Furthermore, the following formatting is used:

- Text appearing in (drop-down) menus (such as *Open...*, *Save as...* etc.) and paths to locations on your hard drive or other storage devices is printed in *italics*.
- Text appearing elsewhere on the screen (labels of buttons, controls, text next to checkboxes etc.) is printed in light blue. Whenever you see this formatting applied, you will find the same text appearing somewhere on the screen.
- Important names and concepts are printed in **bold faced letters**.

- References to keys on your computer's keyboard you'll find put in square brackets (e.g., "Press [Shift] + [Return]").

► Single instructions are introduced by this play button type arrow.

→ Results of actions are introduced by this smaller arrow.

2 What Is REAKTOR PRISM and REAKTOR PRISM FX?

REAKTOR PRISM is a powerful polyphonic synthesizer to be used with REAKTOR PLAYER and REAKTOR 5.5. REAKTOR PRISM takes advantage of the potential of Modal synthesis, a method typically used for physical modeling, and adds a special twist of its own with its intuitive generation of complex sets of partials.

The modal sound engine is combined with dedicated voice processing, several powerful effects, and unique feedback loops. Together these form a playable synthesizer capable of generating a wide range of sounds, from acoustic and organic to synthetic and alien. REAKTOR PRISM delivers complex and innovative synthesis in a clean and easy-to-learn user interface.

The instrument comes with more than 200 professionally designed presets. Its factory library contains a large variety of plucked and percussive sounds as well as atmospheric pads and soundscapes. Modifying these sounds will be an easy and intuitive way to create your own signature sounds.

REAKTOR PRISM FX is a six-note polyphonic effect version of the powerful REAKTOR PRISM synthesizer to be used with REAKTOR PLAYER and REAKTOR 5.5. REAKTOR PRISM FX takes advantage of the Modal synthesis engine from REAKTOR PRISM to apply complex sets of partials and overtones to incoming audio signals. REAKTOR PRISM FX comes with 50 professionally designed presets that are best used on non-melodic sounds such as percussion and drum loops.

3 Installation and Activation

3.1 Installing REAKTOR PRISM and REAKTOR PRISM FX

The following section explains how to install and activate REAKTOR PRISM and REAKTOR PRISM FX. Although this process is straightforward, please take a minute to read these instructions, as doing so might prevent some common problems.

- To install REAKTOR PRISM and REAKTOR PRISM FX, double-click the installer application and follow the instructions on the screen. The installer application automatically places the new Ensemble files into a REAKTOR PLAYER directory. Alternatively, during the installation process, choose the directory where you would like to have REAKTOR PRISM and REAKTOR PRISM FX installed.

  ! REAKTOR 5.5 or REAKTOR PLAYER is required to play REAKTOR Instruments and Effects. You can download the free REAKTOR PLAYER from the Native Instruments website.

3.2 Activating REAKTOR PRISM and REAKTOR PRISM FX

When installation is finished, start the Service Center application, which was installed with REAKTOR PRISM and REAKTOR PRISM FX. It will connect your computer to the Internet and activate your REAKTOR PRISM and REAKTOR PRISM FX installation. In order to activate your copy of REAKTOR PRISM and REAKTOR PRISM FX, you have to perform the following steps within the Service Center:

1. **Log in**: Enter your Native Instruments user account name and password on the initial page. This is the same account information you used in the Native Instruments Online Shop, where you bought your instrument REAKTOR Instrument, and for other Native Instruments product activations.
2. **Select products**: The Service Center detects all products that have not yet been activated and lists them. You can activate multiple products at once—for example, several REAKTOR Instruments.
3. **Activate**: After proceeding to the next page, the Service Center connects to the Native Instruments server and activates your products.

4. **Download updates**: When the server has confirmed the activation, the Service Center automatically displays the Update Manager with a list of all available updates for your installed products. Please make sure that you always use the latest version of your Native Instruments products to ensure they function correctly.

Downloading updates is optional. After activation is complete, you can always quit the Service Center.

4 How to Use REAKTOR PRISM and REAKTOR PRISM FX

The following sections will give you a brief overview over some basic operations: you will learn how to open REAKTOR PRISM and REAKTOR PRISM FX, how to explore the factory-set Snapshots and how to load and play REAKTOR PRISM and REAKTOR PRISM FX snapshots from the Main bar and the Sidepane.

For latest information on REAKTOR PLAYER files please refer to the REAKTOR 5.5 Getting Started Guide.

4.1 How to Open REAKTOR PRISM

This is how to open REAKTOR PRISM and REAKTOR PRISM FX in REAKTOR or REAKTOR PLAYER:

The following screen shots show REAKTOR PRISM. Please be aware the instructions here are identical for REAKTOR PRISM and REAKTOR PRISM FX.

4.2 Exploring Snapshots

If you loaded REAKTOR PRISM play some notes on your MIDI keyboard to get an idea of how the synthesizer sounds. Then, let's change the sound completely by loading a different Snapshot. Alternatively, if you loaded REAKTOR PRISM FX apply the effect to some audio or another virtual instrument within your DAW (Digital Audio Workstation) and step through the presets to get an idea of how it sounds.

A Snapshot is REAKTOR's notion for a sound, preset, or patch. REAKTOR PRISM and REAKTOR PRISM FX can hold banks of Snapshots, and loading any of these Snapshots will set each control of to a specific value, and re-create a particular sound.

The Snapshots of REAKTOR PRISM and REAKTOR PRISM FX are accessible from the central control in REAKTOR PLAYER's Main Bar or from the Sidepane.

Fig. 4.1 REAKTOR PRISM interface with Snapshot list in the Sidepane.

- **[1]** Sidepane Button
- **[2]** Snapshot drop-down menu
- **[3]** Snapshot Banks
- **[4]** Snapshots

4.2.1 Loading a Snapshot from the Sidepane

If not already visible after startup, you need to open the Sidepane. The Sidepane holds a full overview of REAKTOR's Snapshot Banks and Snapshots from the currently selected Snapshot Bank.

1. Click the Sidepane button **(1)** in the Main Bar to open the Sidepane.
2. Select a Snapshot Bank **(3)**.

3. Select the name of a Snapshot entry **(4)**.

The name of the selected Snapshot will be highlighted in the Sidepane, and the Snapshot loaded and ready in REAKTOR PRISM or REAKTOR PRISM FX.

4.2.2 Loading a Snapshot from the Main Bar

Loading a Snapshot from the REAKTOR PLAYER drop-down menu in the Main Bar is the simplest way to interact with Snapshots.

1. Click the Snapshot drop-down menu control **(2)**. The menu holds all Snapshots and Banks of the instrument.
2. Click an entry to select it.

4.3 Saving a Snapshot

Snapshots can only be saved when using the full version of REAKTOR, however, all your settings will be recalled perfectly in a host if you are using REAKTOR PLAYER, so you can tweak a sound perfectly for your song. All parameter settings made in REAKTOR PRISM and REAKTOR PRISM FX will be saved as part of your DAW project. Please read the REAKTOR documentation for more information on plug-in mode.

For the latest information on REAKTOR PLAYER please refer to the REAKTOR 5.5 Getting Started Guide.

5 Overview of REAKTOR PRISM Ensemble

REAKTOR PRISM is intended to be a very playable, responsive polyphonic instrument with a dynamic, expressive and organic sound. In general the character of REAKTOR PRISM is designed to be more acoustic and subtle. In comparison to other synthesizers, the most obvious difference is that there are no real oscillators or samples. REAKTOR PRISM is based on a Modal synthesis model, and sound is created by an Exciter, which creates impulses or continuous noise. REAKTOR PRISM supplies the real twist when this 'noise' is fed into its Modal Bank. This module has multiple resonating band-pass filters per voice, similar to Additive synthesis, creating a unique character. Ultimately, this type of synthesis allows the emulation of sounds by giving control over the frequency and amplitude of each individual harmonic or partial.

The narrow band filters of the Modal Bank turn impulse signals into decaying sine oscillations, and with noise signals at the input they can create continuous tuned sounds. The input determines the amplitude and phases of the resonance in a naturally physical way. The filters can be compared to the oscillation modes of a physical object (e.g. a membrane, a string, a mallet), where each mode has a characteristic frequency, decay time and amplitude amount. As with Additive synthesis, these are known as partials. By adding up multiple partials, the sound becomes complex. Depending on the chosen frequencies, the sound can be a clear tone or a more disharmonic sound like percussion instruments.

In addition to the Exciter and Modal Bank, resonator REAKTOR PRISM has a few additional components that can be used for creative purposes:

- A polyphonic delay and all-pass
- Saturation and clipping stages
- A Voice Processing mixer
- A chain of custom effects (Cabinet (amp emulation), 8-Pole HP/LP Filter, Flanger, Echo and Reverb)
- Two feedback loops (a voice feedback and a feedback from the output of the effects chain)

Velocity sensitivity plays a great role in the real-time variation of the sound. It can be used to create a very wide dynamic range of loudness and timbre. Velocity can be applied to the two envelopes: to a low-pass filter in the Exciter and to an emulated low-pass filter in the

Modal Bank. In addition it can be routed to one of 26 parameters for modulation. While the first envelope is dedicated to control the Exciter, the second envelope (Mod Envelope) can be flexibly routed to up to six targets. A polyphonic LFO can modulate two independent targets which can be chosen from a list.
More expressive potential becomes available by applying the two Macro Controllers MC1 and MC2. Both can assign each address up to three parameters. MC1 and MC2 can be assigned to volume/expression pedals and/or the Mod Wheel, or to other MIDI controllers (e.g. XY pads), but they can also be easily controlled by sequencer automation curves, or you assign a sync able monophonic LFO to the macros as an internal source of periodic movements.

Due to feedback loops and extreme sound coloring be aware that REAKTOR PRISM can sometimes produce sounds which may result in high amplitude. For your safety and comfort Native Instruments recommend you do not edit parameters at high volume levels.

For an overview of REAKTOR PRISM FX please read Chapter ↑6, Overview of the REAKTOR PRISM FX Interface.

5.1 Overview of Signal Flow

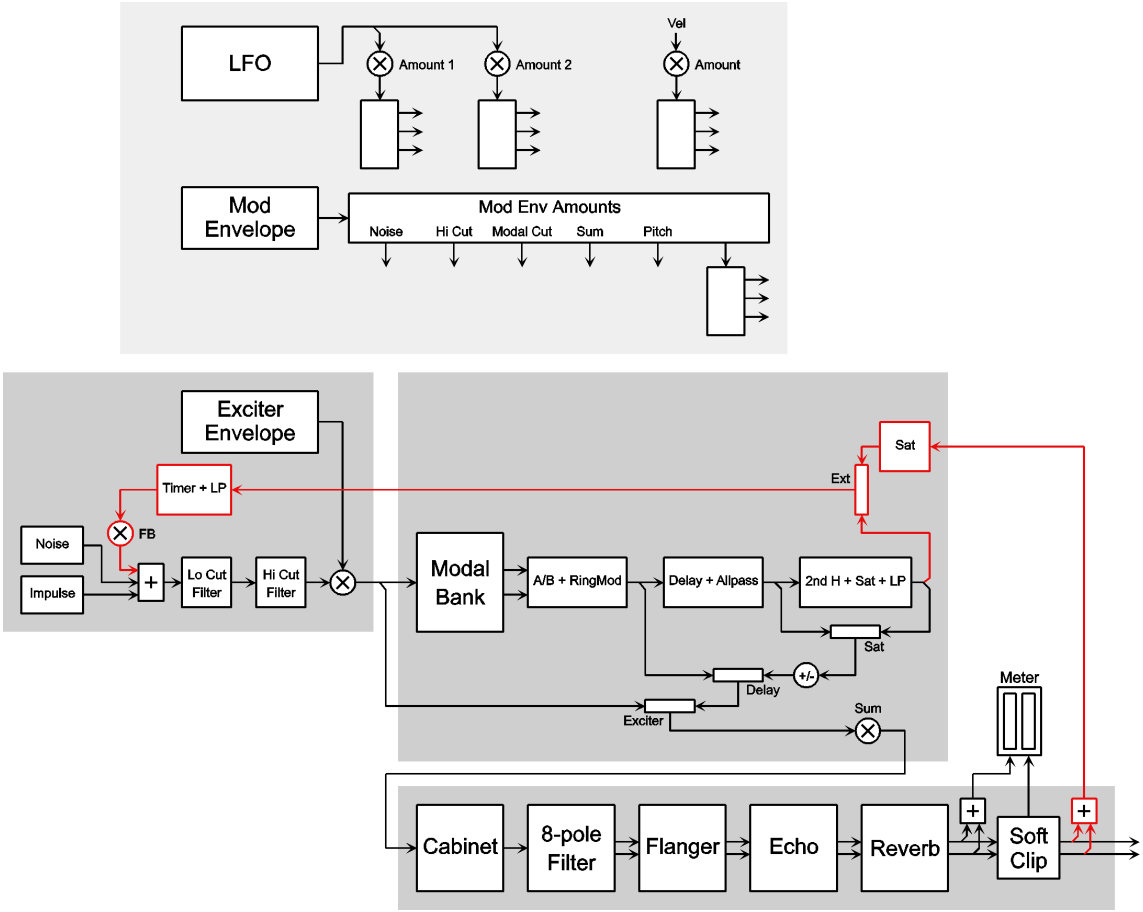

Fig. 5.1 Signal flow in REAKTOR PRISM

The feedback loops (highlighted red in the signal flow diagram) allow some of the most interesting behaviors of REAKTOR PRISM. The output signal is used to excite the Modal bank, and instead of a decaying signal there will be continuous oscillations, which depend very much on the processing in the feedback loop and of course on the filtering behavior of the Modal Bank.
As we all know, feedback without saturation can lead to extremely high levels. Therefore, some careful shaping is applied. In addition, the phase behaviors of the delay and the all-pass give a strong influence, over which frequencies get emphasized or damped by the feedback. This feedback loop is per voice, so each note will only feedback on itself.
The second feedback loop (labeled “Ext.”) uses the total signal from the output of the effects chain, which also lets the effects influence the feedback a lot. Using the EXT feedback loop allows cross talk between voices where the notes you play will influence the feedback.

5.2 Overview of REAKTOR PRISM User Interface

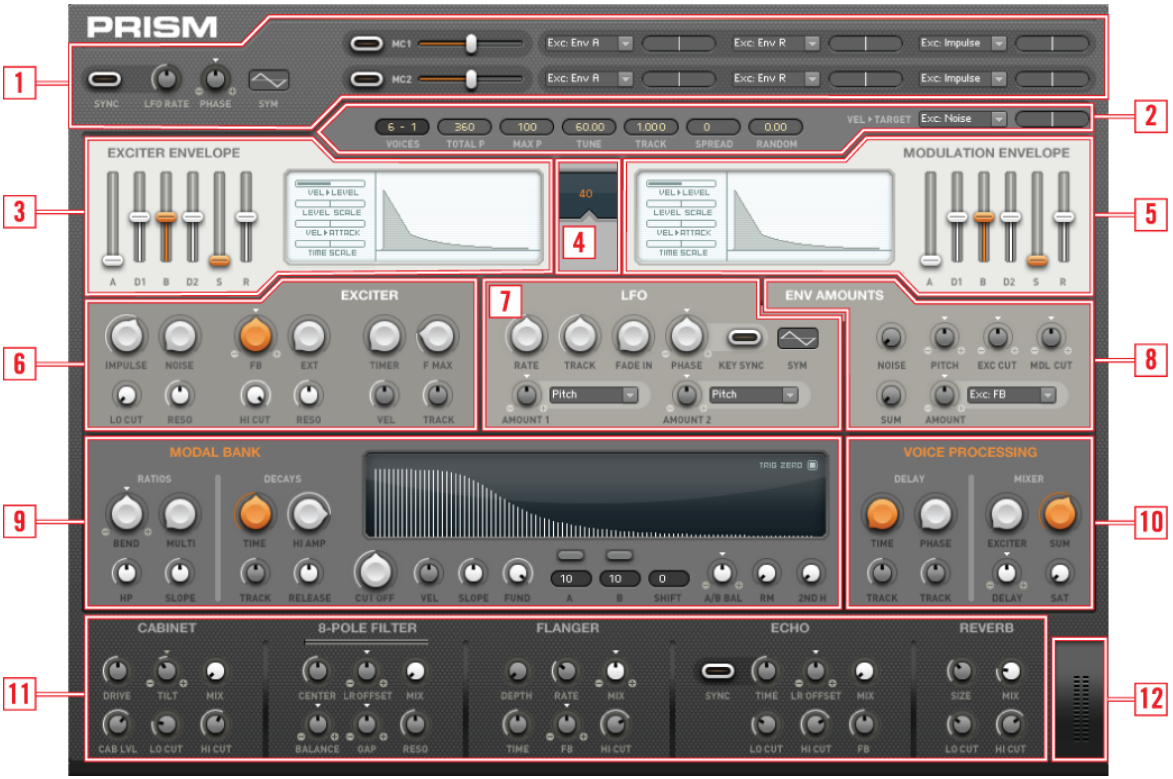

Fig. 5.2 Overview of REAKTOR PRISM User Interface

- **[1] MACRO CONTROLLERS**: Set real-time musical control and modulation of parameters.
- **[2] GLOBAL CONTROL**: Set global synthesizer controls such as Polyphony, Tuning and Key Tracking. Velocity routing is also found here.
- **[3] EXCITER ENVELOPE**: Controls the amplitude of the Exciter Signal to a fixed target.

  Long attacks can cut out the impulse portion of the Exciter. The Exciter envelope is most useful for Noise.

- **[4] VALUE**: Displays the value of the parameter last changed.

- **[5] MODULATION ENVELOPE**: Controls the modulation envelope for parameters set in the Modulation Envelope Amounts Section.

  Routing the Modulation envelope to Sum, can give you an overall envelope for the sound, cutting out unwanted feedback decays or sharp attacks.

- **[6] EXCITER**: Contains controls for impulse and noise generation, as well as filters and control for the feedback.
- **[7] LFO**: A polyphonic LFO providing cyclic change to two modulation targets choosable from 26 sound parameters.
- **[8] ENV AMOUNTS**: Determines the amount parameters are modulated in, in relation to the Modulation Envelope section **[5]**.
- **[9] MODAL BANK**: A display visualizes the ratios and amplitude of the partials in the last voice played. It is also possible to set the Modal Bank parameters for Ratios, Decays and Amplitudes and to adjust the amount of Ring Modulation and 2nd-harmonic distortion in the Saturator.
- **[10] VOICE PROCESSING**: Set DELAY and MIXER parameter levels. DELAY may be used as a comb filter for the feedback structure or the output. Mixer contains three crossfaders to set the mix between the signals from the EXCITER, the MODAL BANK, the DELAY and the SATURATION stage.
- **[11] EFFECTS CHAIN**: The output of the mixer is processed by a chain of five effects.
- **[12] METERS**: The two Meters allow to monitor the output signal and the amount of saturation in the Soft Clipper, which prevents hard clipping at the sound card.

5.3 Macro Controller Section

REAKTOR PRISM has two Modulation Macro Controllers. These are most conveniently used with remote controllers, in a keyboard setting roughly corresponding to a volume or expression pedal, and the modulation wheel. Both MC1 and MC2 controllers can address up to three parameters. They can be assigned to volume/expression pedals and/or the Mod Wheel, or to other MIDI controllers, e.g., XY pads. But they can also be easily controlled by sequencer automation curves. In addition, you can also assign the monophonic LFO as an internal source of periodic movements.

The modulation amount for controller targets can be set by the corresponding faders. Sliding the fader to the right causes positive, sliding it to the left, negative modulation amounts. This means that for positive modulation amounts the target parameter is increased as the Macro Controller is increased in value. For negative modulation amounts the target parameter would be reduced as the Macro Controller is increased in value.

5.3.1 PRISM – Modulation Targets for Each Controller

MC1/MC2 First Controller Modulation List	MC1/MC2 Second Controller Modulation List	MC1/MC2 Third Controller Modulation List
Exc: Env A	Exc: Env R	Exc: Impulse
Exc: Noise	Exc: FB	Exc: Ext FB
Exc: Timer	Exc: Max	Exc: Lo Cut
Exc: Hi Cut	Modal: Bend	Modal: Multi
Modal: HP	Modal: HP Slope	Modal: Release
Modal: Time	Modal: Hi Amt	Modal: Cutoff
Modal: Fund	Modal: A	Modal: B
Modal: Shift	Modal: A/B Bal	Modal: RM
VDelay: Time	VDelay: Phase	Modal: 2nd H
Mixer: Sat	Mixer: Exciter	Mixer: Delay
Mixer: Sum	Mixer: Sum	Mixer: Sum
LFO: Rate	LFO: Amount 1	LFO: Amount 2
Cabinet: Drive	Cabinet: Tilt	Cabinet: Mix
Cabinet: Level	Cabinet: Hi Cut	8P Filter: Center
8P Filter: LR	8P Filter: Gap	8P Filter: Mix
8P Filter: Balance	8P Filter: Reso	Flanger: Time
Flanger: FB	Flanger: Rate	Flanger: Depth
Flanger: Mix	Echo: Time	Echo: LR

MC1/MC2 First Controller Modulation List	MC1/MC2 Second Controller Modulation List	MC1/MC2 Third Controller Modulation List
Echo: Mix	Echo: Hi Cut	Echo: FB
Reverb: Size	Reverb: Mix	Reverb: Hi Cut

5.3.2 PRISM FX – Modulation Tagets for Each Controller

MC1/MC2 First Controller Modulation List	MC1/MC2 Second Controller Modulation List	MC1/MC2 Third Controller Modulation List
Gate: Threshold	Gate: H Time	Tune
Exc: Noise	Exc: FB	Exc: Ext FB
Exc: Timer	Exc: F Max	Exc: Lo Cut
Exc: Hi Cut	Modal: Bend	Modal: Multi
Modal: HP	Modal: HP Slope	Modal: Release
Modal: Time	Modal: Hi Amt	Modal: Cutoff
Modal: Fund	Modal: A	Modal: B
Modal: Shift	Modal: A/B Bal	Modal: RM
VDelay: Time	VDelay: Phase	Modal: 2nd H
Mixer: Sat	Mixer: Exciter	Mixer: Delay
Mixer: Sum	Mixer: Sum	Mixer: Sum
LFO: Rate	LFO: Amount 1	LFO: Amount 2
Cabinet: Drive	Cabinet: Tilt	Cabinet: Mix
Cabinet: Level	Cabinet: Hi Cut	8P Filter: Center
8P Filter: LR	8P Filter: Gap	8P Filter: Mix
8P Filter: Balance	8P Filter: Reso	Flanger: Time
Flanger: FB	Flanger: Rate	Flanger: Depth
Flanger: Mix	Echo: Time	Echo: LR

MC1/MC2 First Controller Modulation List	MC1/MC2 Second Controller Modulation List	MC1/MC2 Third Controller Modulation List
Echo: Mix	Echo: Hi Cut	Echo: FB
Reverb: Size	Reverb: Mix	Master Mix

5.3.3 Macro Controller Parameters

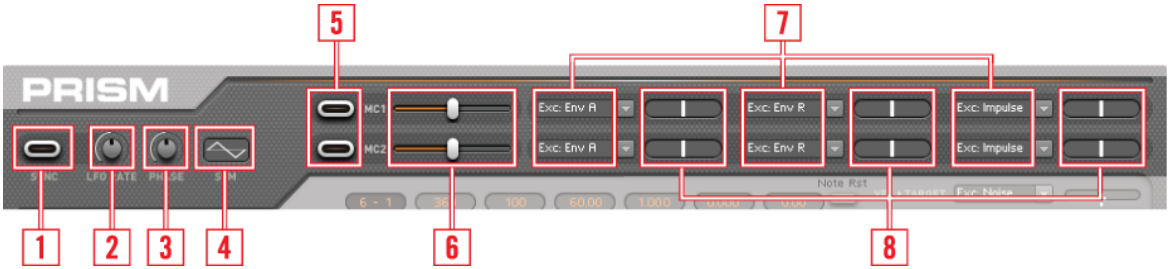

Fig. 5.3 Macro Controller section

- **[1]** SYNC: Tempo Sync—in this mode the LFO rate is rounded to a multiple of the global tempo (in quarters/beats), and the phase of the LFO is synced to the song position.
- **[2]** LFO RATE: LFO frequency (Hz when SYNC is off, multiples of the BPM when SYNC is on).
- **[3]** PHASE: When SYNC is on, this parameter shifts the phase of the LFO in relation to the song position:
  - -1: falling ramp on the beat grid
  - -0.5: lower peak on the beat grid
  - 0: rising ramp on the beat grid
  - +0.5: upper peak on the beat grid
  - +1: falling ramp on the beat grid
- **[4]** SYM: The symmetry of the two ramps of the triangle waveform can be set here. Positive values increase the speed of the rising ramp (to change the symmetry of the ramp, drag your mouse holding the button and move across the SYM area.):
  - +1: falling sawtooth
  - 0: symmetric triangle
  - -1: rising sawtooth

- **[5]** MC1/MC2 Buttons: Activate the monophonic LFO to control the targets of Macro Controller 1 and 2.
- **[6]** MC1/MC2 Slider: This Macro Controller has three targets that can be chosen by dropdown menus each with its own control level. It is suggested to assign it to a MIDI controller like an expression pedal or as a sequencer automation parameter. By pressing the button on the left the fader can be replaced by the signal of the monophonic LFO.
- **[7] Modulation Target Menus**: Selects the modulation target for first, second and third target of MC1 and MC2.
- **[8] Amount Sliders**: Control amount of the Macro Controller on the first, second and third target.

5.4 Global Control Section

The Global Control section provides access to the global parameters of REAKTOR PRISM. Here you find settings for Voice polyphony, Partials, Tuning, Tracking, Unison Spread and Random detuning. In addition, you will also find the Velocity Target dropdown menu for note-on velocity modulation. Settings specified in Global Control section are exclusive to each Snapshot.

5.4.1 Global Control Parameters

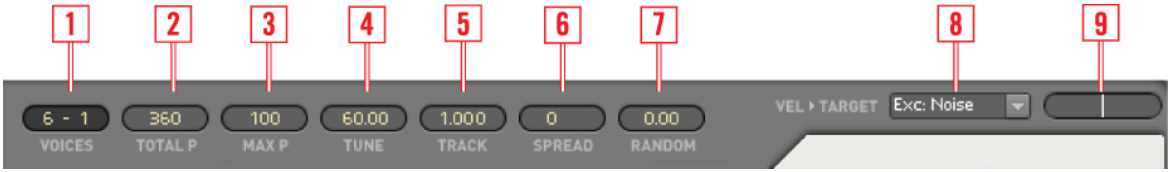

Fig. 5.4 Global Controls section

- **[1]** VOICES: The left field shows the number of voices available for polyphonic playing. The number is set in the header or the Properties of the Instrument. The right number shows the number of voices used in unison.
- **[2]** TOTAL P: Total number of partials available for all voices. The partials are dynamically assigned to the voices. Lower notes will get more partials than higher notes.
- **[3]** MAX P: Maximum number of partials that can be used by one voice.

- **[4]** TUNE: Pitch of the fundamental partial for MIDI note C3 (60). It is displayed in semitones (MIDI note scale). If the key tracking is zero, this pitch is used for all keys.
- **[5]** TRACK: Key tracking of the pitch. It's the scaling factor between the received MIDI note (relative to C3=60) and the pitch of the instrument. At 1.0 the pitch follows the equally tempered scale. At values slightly larger that 1.0 you get a stretched tuning. At 0.0 the sounding pitch is independent from the MIDI note number.
- **[6]** SPREAD: Detuning between unison voices (semitones).
- **[7]** RANDOM: Amount of random detuning applied to each voice at each note-on (semitones).
- **[8]** Vel▶Target: Selects the target for the modulation by the Note-On velocity. See the Note-On Velocity Target List (↑5.4.2, Modulation Targets for Note On Vel Target) for more details.
- **[9] Amount Slider**: Amount of modulation by the Note-On velocity applied to the selected target.

5.4.2 Modulation Targets for Note On Vel Target

Note-On Velocity Modulation List
Exc: Noise
Exc: FB
Exc: Timer
Exc: Max P
Exc: Lo Cut
Modal: Bend
Modal: Multi
Modal: HP
Modal: Time
Modal: Hi Amt
Modal: Release
Modal: Slope

Note-On Velocity Modulation List
Modal: Fund
Modal: A
Modal: B
Modal: Shift
Modal: A-B
Modal: RM
VDelay: Time
VDelay: Phase
Mixer: Exciter
Mixer: Sum
Mixer: Delay
Mixer: Sat
LFO: Rate
LFO: Amount 1
LFO: Amount 2

5.5 Exciter Envelope Section

The Exciter Envelope section produces the modulating signal for the Modal Bank amplitudes. The Attack, Decay1, Breakpoint, Decay2, Sustain, and Release parameters of the Exciter amplitude envelope determine how the amplitude of the sound evolves over time when a note is played.

Note that the Impulse portion of the signal is very short and can easily be accidently removed by a long attack.

Exciter Envelope Parameters

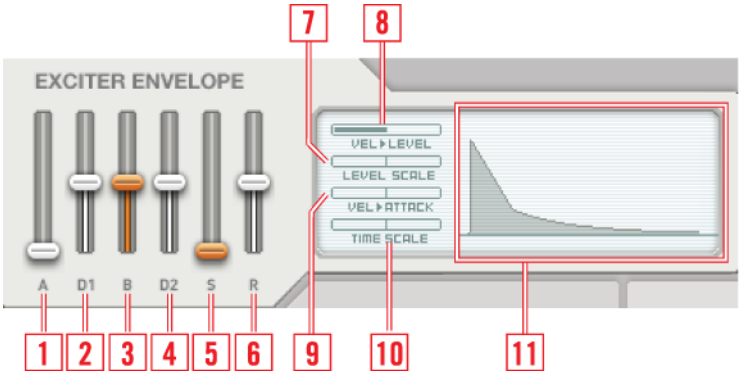

Fig. 5.5 Exciter Envelope section

- **[1]** A: Attack time of the Exciter Envelope. It affects all exciter signals and therefore has a strong influence on the shape of the Impulse signal. Logarithmic scaling: -40..20..0..20..40..60..80 = 0.01..0.1..1..10..100..1000..10000 ms.
- **[2]** D1: Time of the first (linear) Decay segment. Logarithmic scaling: 0..20..40..60..80 = 1..10..100..1000..10000 ms.
- **[3]** B: Level of the Breakpoint between the two Decay segments.
- **[4]** D2: Time of the second (exponential) Decay. Logarithmic scaling: 0..20..40..60..80 = 1..10..100..1000..10000 ms.
- **[5]** S: Sustain level of the Exciter Envelope. It affects all exciter signals and therefore has a strong influence on the amount of feedback.
- **[6]** R: Release time. Logarithmic scaling: 0..20..40..60..80 = 1..10..100..1000..10000 ms.
- **[7]** LEVEL SCALE: Keyboard scaling for the peak, breakpoint and sustain levels [dB per semitone]. Positive values: higher levels for higher notes (+0.5 = +6 dB per octave). Negative values: lower levels for higher notes (-0.5 = -6 dB per octave). Origin at C3 = 60.
- **[8]** VEL▶LEVEL: Influence of the keyboard velocity on the peak and sustain levels of the envelope. 0: no influence and constant levels. 1: full linear control by velocity, dynamic range 43 dB.

- **[9]** VEL▶ATTACK: Velocity influence on the Attack time. This can be used to modulate the spectrum of the Impulse signal. Positive values: longer attack at higher velocities. Negative values: shorter attack at higher velocities.
- **[10]** TIME SCALE: Keyboard scaling of the attack, decay and release times. Positive values: longer times for higher notes (+0.5 = 2x per octave, +1.0 = 4x per octave). Negative values: shorter times for higher notes (-0.5 = 0.5x per octave, -1.0 = 0.25x per octave). Origin at C3 = 60.
- **[11] Exciter Envelope Display**: Displays the current envelope, as set by Attack, Decay 1, Breakpoint, Decay 2, Sustain and Release.

5.6 Modulation Envelope Section

The Modulation Envelope section provides the Attack, Decay1, Breakpoint, Decay2, Sustain, and Release Parameters for the modulation source set in the Envelope Amounts Section and determines how the amplitude of the modulated source evolves over time when a note is played.

Modulation Envelope Parameters

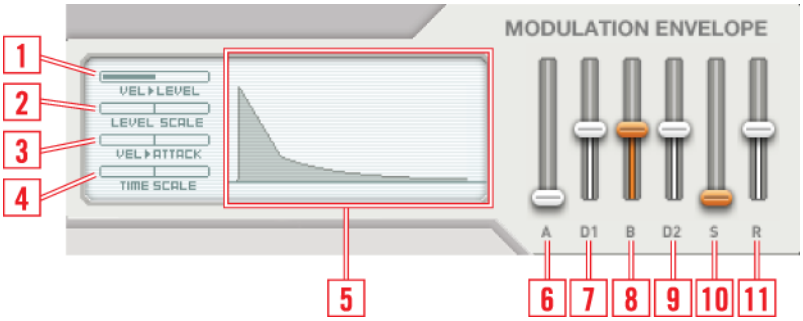

Fig. 5.6 Modulation Envelope section

- **[1]** VEL▶LEVEL: Influence of the key velocity on the peak and sustain levels of the envelope. 0: no influence, constant levels. 1: full linear control by velocity, dynamic range: 43 dB.

- **[2]** LEVEL SCALE: Keyboard scaling of the envelope peak and sustain levels [dB per semitone]. Positive values: higher levels for higher notes (+0.5 = +6 dB per octave). Negative values: lower levels for higher notes (-0.5 = -6 dB per octave). Origin at C3 = 60.
- **[3]** VEL▶ATTACK: Velocity influence on the Attack time. Positive Values: longer attack when playing loud. Negative values: shorter attack when playing loud.
- **[4]** TIME SCALE: Keyboard scaling of the Attack, Decay and Release times. Positive values: longer times for higher notes (+0.5 = 2x per octave, +1.0 = 4x per octave). Negative values: shorter times for higher notes (-0.5 = 0.5x per octave, -1.0 = 0.25x per octave). Origin at C3 = 60.
- **[5] Modulation Envelope Display**: Displays the current envelope, as set by Attack, Decay 1, Breakpoint, Decay 2, Sustain and Release.
- **[6]** A: Modulation Attack time. Logarithmic scaling: -20..0..20..40..60..80 = 0.1..1..10..100..1000..10000 ms.
- **[7]** D1: Time of the first (linear) Modulation Decay segment. Logarithmic scaling: 0..20..40..60..80 = 1..10..100..1000..10000 ms.
- **[8]** B: Level of the Modulation Breakpoint between the two Decay segments.
- **[9]** D2: Time of the second (exponential) Modulation Decay segment. Logarithmic scaling: 0..20..40..60..80 = 1..10..100..1000..10000 ms.
- **[10]** S: Modulation Sustain level.
- **[11]** R: Modulation Release time. Logarithmic scaling: 0..20..40..60..80 = 1..10..100..1000..10000 ms.

5.7 Exciter Section

The Exciter contains a generator for impulses and a generator for noise, as well as the controls for feedback. Both signals are mixed and processed by a highpass and a lowpass filter. The resulting signal is shaped by the Exciter Envelope. The resonance of these filters can play a huge role in the resulting sound—even on just the impulse. For that reason, there are also keyboard and velocity tracking amounts for the cutoff.

The other major feature of the Exciter section is the feedback control. The main control here is the orange feedback knob (FB) that controls the amount. The EXT knob crossfades between per voice feedback before the effects and monophonic feedback after the effect. A TIMER knob to turn the feedback into a pulse and eliminate unwanted high frequencies rounds out the controls.

Exciter Parameters

Fig. 5.7 Exciter section

- **[1]** IMPULSE: Level (dB) of the impulse signal in the Exciter signal. Please note that the impulse is shaped by the Exciter Envelope. When the Attack time is increased it will be damped.
- **[2]** NOISE: Level (dB) of the noise signal as part of the Exciter signal. The noise signal is shaped by the Exciter Envelope and can be also modulated by the Mod Envelope and the LFO.
- **[3]** FB: Amount of feedback signal mixed to the Exciter signal. Bipolar control for positive and negative feedback.
- **[4]** EXT: Crossfades between the output of the polyphonic instrument and the (monophonic) output of the effects chain as a source for feedback.
- **[5]** TIMER: The feedback signal is converted to a pulse signal with adjustable minimum pulse-width. This parameter crossfades between the original feedback signal and the pulse-shaped signal.

- **[6]** F MAX: Adjusts the minimum duration of the pulses created from the feedback signal by the Timer. This determines the maximum frequency of the pulse signal (in semitones relative to the note pitch). It also controls the cutoff of a lowpass filter in the feedback path.
- **[7]** LO CUT: Cutoff (as number of the partials) of the highpass, that controls the amount of Ratio bending for higher partials.
- **[8]** RESO: Resonance of the Exciter's Low Cut (highpass) filter.
- **[9]** HI CUT: Static amount of the cutoff frequency of the Exciter's High Cut (2-pole lowpass) filter (semitones).
- **[10]** RESO: Resonance of the Exciter's High Cut (lowpass) filter.
- **[11]** VEL: Amount of velocity applied to HI CUT, the cutoff frequency of the lowpass filter of the Exciter. The upper limit of the velocity range is given by the value of HI CUT, the lower limit depends on the VEL amount.
- **[12]** TRACK: Key tracking amount of the cutoff frequencies of the Exciter's Low Cut and High Cut filters0.0 - no tracking with the key position1.0 - the key position (relative to C3 = 60) is fully added to the filter cutoffs.

5.8 LFO Section

The polyphonic LFO section contains the controls for a per voice LFO. That means that for each note, the LFO will be triggered with these settings, so if you play two notes slightly after each other, they each will have their modulation with their own timing. The LFO rate can also vary from note to note since it can be influenced by pitch tracking. This is really powerful for creating per-note vibrato and fade-in effects. The LFO has two selectable targets with their own amounts.

5.8.1 LFO Parameters

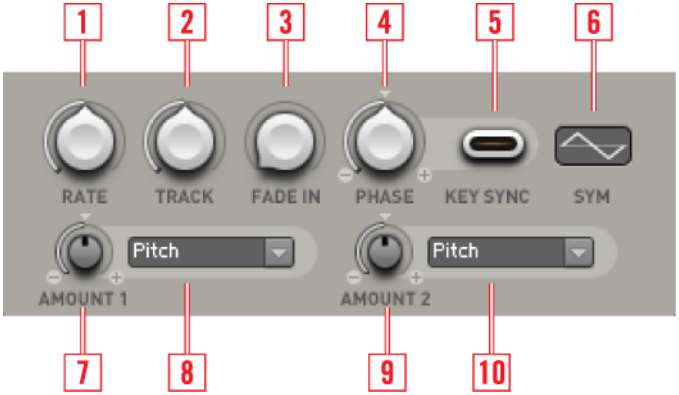

Fig. 5.8 LFO section

- **[1]** RATE: Set the rate of the LFO frequency [Hz].
- **[2]** TRACK: Keyboard tracking amount of the LFO frequency. If it is set to zero and the Key Sync is off the voices are in sync like with a monophonic LFO.
- **[3]** FADE IN: Fade-in time [in seconds]. It controls the ramp-up of the LFO amplitude, which is triggered by each Note On.
- **[4]** PHASE: When KEY SYNC is on, this parameter determines the phase of the LFO at Note On:
  - -1: zero crossing of the falling ramp
  - -0.5: lower peak
  - 0: zero crossing of the rising ramp
  - +0.5: upper peak
  - +1: zero crossing of the falling ramp
- **[5]** KEY SYNC: Activates the sync of the polyphonic LFO to Note On events. The start phase at Note On can be adjusted by the PHASE parameter. If KEY SYNC is off and the Track is set to zero the voices are in sync like with a monophonic LFO.
- **[6]** SYM: The symmetry of the two ramps of the triangle waveform can be set here. Positive values increase the speed of the rising ramp (To change the symmetry of the ramp, drag your mouse holding the button and move across the SYM area):
  - +1: falling sawtooth.

    - 0: symmetric triangle.
    - -1: rising sawtooth
- **[7]** AMOUNT 1: Amount of LFO modulation applied to the first target, selected in the menu.
- **[8]** LFO Target Menu 1: Selects the first target for LFO modulation.
- **[9]** AMOUNT 2: Amount of LFO modulation applied to the second target, selected in the menu.
- **[10]** LFO Target Menu 2: Selects the second target for LFO modulation.

5.8.2 LFO Targets

LFO Targets
Pitch
Exc: Noise
Exc: FB
Exc: Timer
Exc: Max P
Exc: Lo Cut
Exc: Hi Cut
Modal: Bend
Modal: Multi
Modal: HP
Modal: HP Slope
Modal: Cutoff
Modal: Time
Modal: Hi Amt
Modal: Fund
Modal: A
Modal: B

LFO Targets
Modal: Shift
Modal: A-B
Modal: RM
VDelay: Time
VDelay: Phase
Mixer: Exciter
Mixer: Sum
Mixer: Delay
Mixer: Sat

5.9 Envelope Amounts Section

The Modulation Envelope Amounts section allows you to significantly affect the way the sound evolves over time and gives it a more lively character. The Envelope Amount determines how certain parameters of REAKTOR PRISM are modulated by the Modulation Envelope Section.

5.9.1 Envelope Amounts Parameters

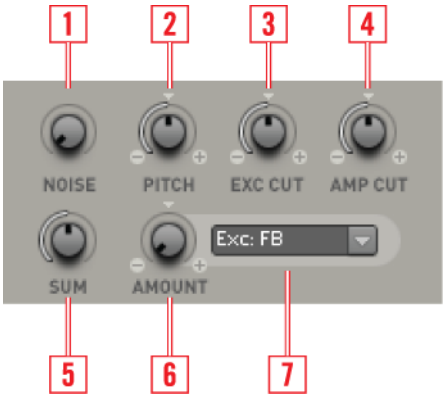

Fig. 5.9 Modulation Envelope Amounts

- **[1]** NOISE: Amount of envelope modulation applied to the noise signal of the Exciter.
  - 0.0: no modulation
  - 1.0: full modulation (multiplying)
- **[2]** PITCH: Determines how much the pitch is modulated by the envelope.
- **[3]** EXC CUT: Amount of envelope modulation added to the Hi Cut frequency of the Exciter
- **[4]** AMP CUT: Amount of envelope modulation added to the cutoff of the lowpass that controls the amplitude of the higher partials.
- **[5]** SUM: Amount of envelope modulation applied to the target that is selected by the menu.
- **[6]** AMOUNT: Amount of envelope modulation applied to the Sum of the output mixer.
  - 0.0: no modulation
  - 1.0: full modulation (multiplying)
- **[7]** Envelope Modulation Target Menu: Selects a target for envelope modulation. See section ↑5.9.2, Env Amounts Modulation Targets for details.

5.9.2 Env Amounts Modulation Targets

Env Amounts Modulation Targets
Exc: FB
Exc: Timer
Exc: Max P
Exc: Lo Cut
Modal: Bend
Modal: Multi
Modal: HP
Modal: Time
Modal: Hi Amt
Modal: Fund
Modal: A

Env Amounts Modulation Targets
Modal: B
Modal: Shift
Modal: A-B
Modal: RM
VDelay: Time
VDelay: Phase
Mixer: Exciter
Mixer: Delay
Mixer: Sat
LFO: Rate
LFO: Amount 1
LFO: Amount 2

5.10 MODAL Bank Section

With up to 100 resonating partials (can be set to a max. of 200) it is the sounding object (like a string or membrane or bell) and, therefore, the heart piece of this synth. The Modal Bank display visualizes the ratios and amplitude attenuations of the partials of the last voice played. Please note that it cannot give information about their decay times or their feedback induced resonance or damping.

- **RATIOS Section**: The frequency of a partial is defined by its ratio to the fundamental frequency, which is given by the pitch of the note. This section allows to modify the harmonic ratios in order to get an interesting non-harmonic spectrum.
- **DECAYS Section**: Since the Modal Bank consists of multiple bandbass filters, the resonances (or Q) of the filters are controlled to deliver a shorter or longer decay for impulse signals.
- **Amplitudes Section**: The amplitude factors for the partials have the same effect as a filter. We have implemented the equivalent of a lowpass filter, and comb filter.

- **The Ring Modulator**: The partials in the A and B segments are routed to different outputs of the module and therefore they cannot only be mixed but also processed by a ring modulator. The signals in the ring modulator are not influenced by the A/B Balance or the phase inversion.

Modal Bank Parameters

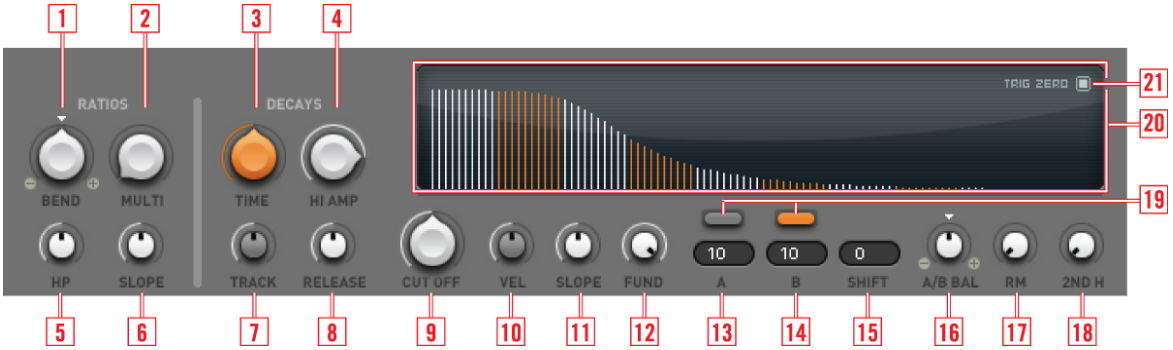

Fig. 5.10 Modal Bank

- **[1]** BEND: Amount of bending applied to the harmonic ratios. The ratio offsets are (for i > 1) determined as follows:
  - Offset = (i-1) * BEND * HP(i) * MULTI(i)
  - i: index of the partial
  - HP(i): the adjustable highpass function
  - MULTI(i): the sine function.
- **[2]** MULTI: A sine curve is used to create the ratio bending offset. At higher values the periods of the sine get shorter, resulting in an increasing number of areas where the distance between the partials are compressed and expanded. At high bending rates the order of the ratios will be folded back.
- **[3]** TIME: Decay time of the modal bank's resonant signals. Logarithmic scale: 20..40..60...80 = 10 ms..100 ms..1 s..10 s
- **[4]** HI AMP: Decay time for higher partials. At the right end of the scale the higher partials have the same decay time as the fundamental. The value shows the amount of damping (log Time/partial) that shortens the decay time for higher partials.

- **[5]** HP: Cutoff (as number of the partials) of the highpass, that controls the amount of Ratio bending for higher partials.
- **[6]** SLOPE: Slope (order) of the high-pass filter for the ratio offsets of the partials. Higher orders create a steeper filter curve.
- **[7]** TRACK: Key tracking of the Decay time. Allows shorter decays for higher notes.0 = no key tracking1 = decay time reduced by factor 2 per octave, Neutral at C3 = 60.
- **[8]** RELEASE: Adjusts the Release time relative to the Decay Time. At the right end of the scale the Release time is equal to the Decay time (no damping). Turning the parameter to the left increases the damping and subtracts up to 80 from the value of the Decay time. The Value shows the resulting Release time in a logarithmic scale: 20..40..60..80 = 10 ms..100ms..1 s..10 s.
- **[9]** CUTOFF: Cutoff (as number of partials) of the lowpass that controls the amplitudes of higher partials. Please note that the lowpass works on the partial index and not on the actual frequency of the partial.
- **[10]** VEL: Amount of velocity applied to CUTOFF. The upper limit of the velocity range is given by the value of CUTOFF, the lower limit depends on the VEL amount.
- **[11]** SLOPE: Slope (order) of the low-pass filter for the amplitudes of the partials. Higher orders create a steeper filter curve.
- **[12]** FUND: Controls the amplitude [dB] of all partials except the fundamental (ratio = 1).
- **[13]** A: Number of partials in the A segments of the comb filter pattern.
- **[14]** B: Number of partials in the B segments of the comb filter pattern.
- **[15]** SHIFT: Shifts the A-B comb pattern by a number of partials. At zero the pattern starts with the left end of an A segment. When it is shifted upwards further B and A segments are filled in.
- **[16]** A/B BAL: Balance between the amplitudes of the partials in the A segments and the partials in the B segments. It does not influence the amplitudes in the Ring Modulator.
- **[17]** RM: Crossfade between the signal from the A/B mixer (A/B BAL) and the result of a Ring Modulation between the A and the B partials
- **[18]** 2ND H: Amount of the second and other even harmonics in the Saturator signal and by this it influences the (internal) feedback behavior.
- **[19]** A/B Invert Buttons: Invert the partials of the A/B segments. In the display they turn red.

- **[20]** Modal Bank Display: For the Amplitudes and ratios (relative frequencies) of the partials of the last voice played. The lines turn red for partials which are phase inverted.
- **[21]** TRIG ZERO: If this switch is on, the signals of the Modal Bank are reset to zero with each note-on. The result is a well reproducible start of the note, but can lead to clicks. If the switch is off, the Modal Bank signals are continuous. By this you can avoid clicks, but the behaving at impulses is less predictable and amplitudes might be less stable.

5.11 Voice Processing Section

The Voice Processing section comprises two units: The first is a polyphonic delay and allpass filter with key tracking. While the delay applies equally to all frequencies (linear phase response), the allpass has a non-linear phase response that can be shifted by the PHASE parameter and introduces a frequency dependent delay.
You can use this section for filtering the output of the forward signal path or/and as important part of the feedbacks structure. The filtering occurs as a comb filter effect when you turn up the Delay amount in the mixer. Maximum cancellation at certain frequencies is achieved at -0.5 and 0.5. The bipolar parameter allows for two types of comb filtering. At negative settings the low end of the spectrum will be attenuated.
The delay and the allpass are always part of the polyphonic feedback path and greatly influence the phases of the feedback signals. The effect of feedback depends on the phase of the signal. At zero degrees, the feedback is positive: it emphasizes the loop signal and may lead to self-oscillation. At 180 degrees, it is negative feedback, which attenuates the loop signal and damps resonances.
At high feedback amounts and low Decay time settings of the Modal Bank the loop will behave more like a wave-guide, where the pitch of the tone is given by the delay's TIME parameter.
The second unit in the Voice Processing section is the polyphonic saturation unit behind the delay, which works as a limiter for the feedback loop. You find an identical (monophonic) saturator in the external feedback loop.

Behind the polyphonic saturator, a key-tracking 1-pole lowpass damps the higher frequency. The saturators don't have adjustable parameters. You can hear the signal of the polyphonic saturator (including the lowpass), when you turn up the DELAY parameter and the SAT parameter. The 2ND H parameter controls the amount of asymmetric shaping of the signal that comes from the output of the Delay and goes to the Saturator stage. It is a parabolic shaping curve, which emphasizes the 2nd harmonic and higher even harmonics. This can have an important influence on the feedback behavior.

Voice Processing Parameters

Fig. 5.11 Voice Processing section

- **[1]** TIME: Delay time (in ms) of the Voice Delay. When Track is not zero the actual delay time also depends on the key position.
- **[2]** PHASE: Phase shift by an allpass filter. The (non-linear) phase response of the allpass goes from 0 degrees at low frequencies to 180 degrees at high frequencies. This parameter shifts the center frequency of the allpass filter down to increase its effect.
- **[3]** TRACK: Keyboard tracking amount of the delay time. Reduces the times for higher notes to let resonance peaks track with the pitch of the notes.0.0: No tracking1.0: The delay time is the reciprocal of the frequency of the note. Neutral at C3 = 60.
- [**4**] TRACK: Keyboard tracking amount of the phase shifting allpass. Reduces the phase shifting for higher notes.
  - 0.0: No tracking
  - 1.0: The center frequency of the allpass is proportional to the frequency of the note.

  - Neutral at C3=60.
- **[5]** SUM: Master level (dB) of the mixer at the output of the synth. From here, the signal is routed to the input of the effect chain, the Cabinet.
- **[6]** EXCITER: Crossfades between the signal of the Modal Bank (including the Voice Delay) and the Exciter signal.
- **[7]** DELAY: Crossfades between the signal from the Modal Bank and the signal from the Voice Delay. At negative values the delayed signal is inverted. The mixed signal is only used for the output mixer. The feedback path gets the pure delayed signal.
- **[8]** SAT: Crossfader for the source of the Delay signal. At the left end it's the output of the Voice Delay, at the right end the output of the Saturator.

5.12 Effects Section

5.12.1 Cabinet

The Cabinet effect works as an amp/speaker simulator.

Cabinet Parameters

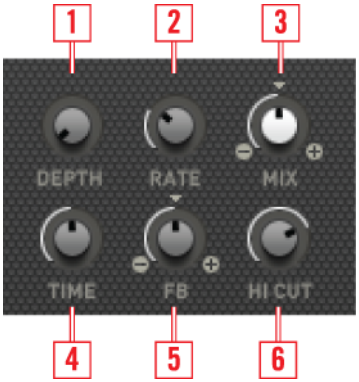

Fig. 5.12 Cabinet from the Effects section

- **[1]** DRIVE: Gain (dB) for the input signal. Higher gains will increase the amount of distortion/saturation.

- **[2]** TILT: Controls two inverted shelving EQs before and after the distortion stage. To the left: more saturation for high frequencies compensated by a high shelving cut. To the right: more saturation for low frequencies compensated by a low shelving cut.
- **[3]** MIX: Crossfades between the dry signal and the saturated signal.
- **[4]** CAB LEVEL: Output level (dB) of the saturation effect before it is mixed with the dry signal.
- **[5]** LO CUT: Cutoff frequency (Hz) of the highpass filter at the input.
- **[6]** HI CUT: Cutoff frequency (Hz) of the lowpass filter for the distorted/saturated signal.

5.12.2 8-Pole Filter

The 8-Pole Filter effect structure comprises four 4-pole filters: each stereo channel has a 4-pole low pass filter and a 4-pole high pass filter. The cutoff frequencies of the low pass and high pass filters are offset from a reference cutoff frequency. This offset is controlled by the GAP parameter. Since the two filters are running in parallel and their output signals are mixed, the result of a positive GAP value is a band rejection. With a negative GAP value the pass bands of both filters are overlapping so that all frequencies can pass and the resonances emphasize the cutoff frequencies. The difference between the reference cutoff frequencies of the two channels is controlled by the LR OFFSET parameter. The CENTER parameter is used to set the mean value of the cutoff frequencies of the two channels.

8-Pole Filter Parameters

Fig. 5.13 8-Pole Filter from the Effects section

- **[1]** LR CUTOFF: Shows the two cutoff frequencies for the left and right channel. A black bar indicates a gap while a brighter bar is shown when the cutoffs overlap.
- **[2]** CENTER: Shifts the mean cutoff frequency of both 4-pole filters on both channels up or down [Hz].
- **[3]** LR OFFSET: Sets the difference between the cutoff frequencies of the left and of the right channel (semitones).
- **[4]** MIX: Crossfades between the dry signal and the filtered signal.
- **[5]** BALANCE: Cross fades between a low pass on the left, high pass on the right, and both in the middle.
- **[6]** GAP: Offset between the cutoffs of the lowpass and the highpass (semitones). Since the two filters are running in parallel and their output signals are mixed, the result of a positive gap is a band rejection. With a negative gap, the pass bands are overlapping so that all frequencies can pass and the resonances emphasize the cutoff frequencies.
- **[7]** RESO: Adjusts the Resonance of the lowpass filter.

5.12.3 Flanger

Flanger produces a spacey whooshing sound due to a mix of the original signal and one processed with a constantly varying delay time.

Flanger Parameters

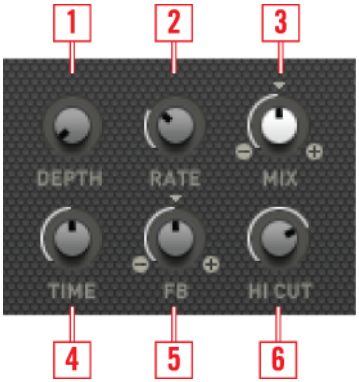

Fig. 5.14 Flanger from the Effects section

- **[1]** DEPTH: Relative amount of the LFO modulation applied to the delay lines.

- **[2]** RATE: Frequency (Hz) of the modulation LFO.
- **[3]** MIX: Crossfades between the dry signal and the delayed signal. At negative values the delayed signal is inverted.
- **[4]** TIME: Delay time of the Flanger (in milliseconds). Longer times will result in a chorus effect.
- **[5]** FB: Amount of feedback. At negative values the feedback is inverted and will emphasize other frequencies than in the non-inverted mode.
- **[6]** HI CUT: Cutoff frequency (in Hz) of the filter that damps the higher frequencies of the delayed signal.

5.12.4 Echo

Echo is a tempo synchronizable stereo delay with high pass and low pass filters.

Echo Parameters

Fig. 5.15 Echo from the Effects section

[1] SYNC: Sets the adjustment of the mean delay time to tempo-synced values. When SYNC is on, the value display will display the rate of the echoes as a multiple of the BPM tempo.
[2] TIME: Mean delay time. As there can be an offset between the left and right channel, this control shows the mean value. When the SYNC button is off the delay is adjustable in milliseconds, when it is on the value display shows the number of echoes per beat and the delay can be set only to certain multiples of the beat time.

[3] LR OFFSET: Sets the ratio between the delay times of the left and of the right channel (value is offset to 1.0). In center position, both delay times are equal.
[4] MIX: Crossfades between the dry signal and the delayed signal.
[5] LO CUT: Cutoff frequency (in Hz) of the filter that damps the lower frequencies of the delayed signal.
[6] HI CUT: Cutoff frequency (in Hz) of the filter that damps the higher frequencies of the delayed signal.
[7] FB: Amount of feedback from the delay output to its input.

5.12.5 Reverb

Use this high quality Reverberation unit to add more spatial depth to your sound.

Reverb Parameters

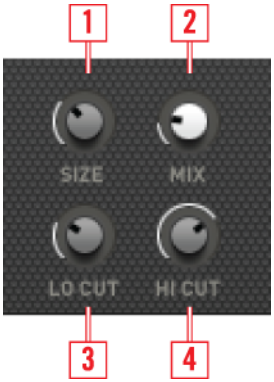

Fig. 5.16 Reverb from the Effects section

- **[1]** SIZE: The room size and reverb time are set here.
- **[2]** MIX: Crossfades between the dry signal and the reverberation signal.
- **[3]** LO CUT: Cutoff of the filter that damps the lower frequencies of the reverberation signal.
- **[4]** HI CUT: Cutoff of the filter that damps the higher frequencies of the reverberation signal.

5.13 Output Meter

The Main Output Meter is situated at the end of the effects chain and provides a visual display of the level at the output of the effects chain and the saturation amount of the Soft Clipper. The Soft Clipper is applied to keep the signal below 0 dBFS and avoid hard clipping.

Output Meter Parameters

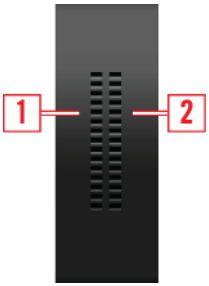

Fig. 5.17 Output Meter

- **[1] Left Meter**: Displays the level at the output of the Reverb.
- **[2] Right Meter**: Displays the amount of saturation in the Soft Clipper.

5.14 Diagram on View B

By selecting the entry *View B* from the context menu of the Panel of REAKTOR PRISM you get to a second view of the instrument that provides a diagram of the signal flow. To return to the normal view, select *View A* from the context menu.

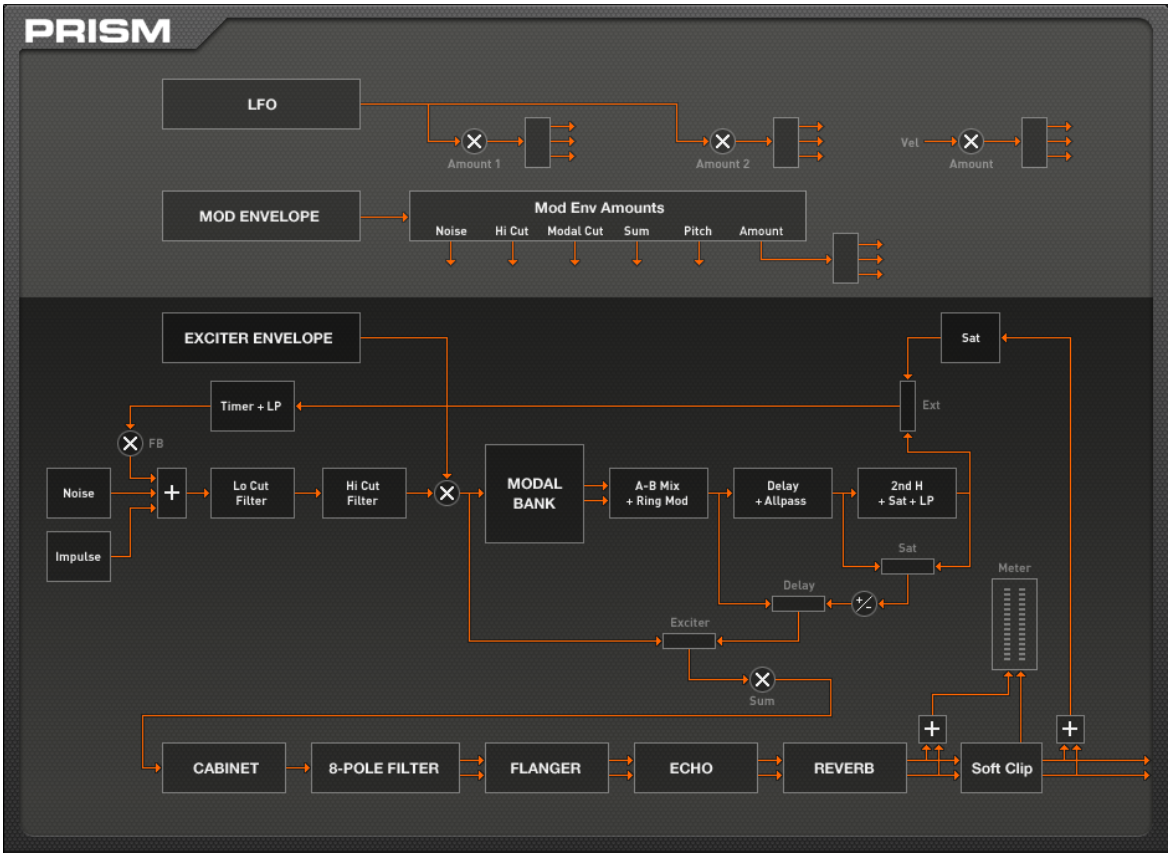

Fig. 5.18 Signal flow diagram on REAKTOR PRISM's B View.

6 Overview of the REAKTOR PRISM FX Interface

If you have used REAKTOR PRISM you will be instantly familiar with the layout of REAKTOR PRISM FX and notice there are only subtle differences between the instrument and effect. The following section outlines these differences and provides a detailed explanation of new parameters. For an explanation of all other parameters please refer to ↑5.2, Overview of REAKTOR PRISM User Interface Overview of REAKTOR PRISM User Interface above.

! To hear sound from REAKTOR PRISM FX you must play notes via a MIDI instrument or toggle notes on for at least one voice in the NOTES section. Please also check the THRESH (threshold) level in the GATE section as a high THRESH level may also prevent the effect from being heard. For more information please read the REAKTOR PRISM FX parameter descriptions below.

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Fig. 6.1 Overview of the REAKTOR PRISM FX Interface

- **(1) E.F.**: Activates the Envelope Follower to control the destinations of Macro Controller 1 and Macro Controller 2.
- **(2) GATE SECTION**: Controls the gate detector and routing section using the following parameters:
  - **GATE FILTER**: Control for the (side chain) filter of the audio input signal used by the GATE. Center position: no filtering. To the left: low-pass filter cutoff (Hz). To the right: high-pass filter cutoff (Hz)
  - **GATE THRESHOLD**: Threshold (dB) of the audio-triggered GATE.
  - **GATE H TIME**: Hold time (ms) for the audio-triggered GATE.

- **GATE OPEN LAMP**: This lamp indicates if the GATE is open. It does not show the effect of the ATT (Attack) and REL (Release) times.
- **GATE/NOTES ATT**: Attack time for the GATE and NOTES signals that are used to control the EXCITER level and the SUM level. -20 - 0 - 20 - 40 - 60 - 80: 0.1 - 1 - 10 - 100 - 1000 - 10000 ms.
- **GATE/NOTES REL**: Release time for the GATE and NOTES signals that are used to control the EXCITER level and the SUM level. 0 - 20 - 40 - 60 - 80: 1 - 10 - 100 - 1000 - 10000 ms.
- **NOTES EXC**: Enables the gating of the EXCITER signal by NOTES. The ATT (Attack) and REL (Release) times of the GATE section will also apply. If GATE is also enabled for the EXCITER both signals need to be active to open the EXCITER output.
- **NOTES REL**: Enables the damping of the Modal Bank by Note-Off events. The damping amount is set by the RELEASE knob in the DECAYS section. If REL by GATE is also enabled, the signal will dampen with MIDI notes and NOTES 1-6 off or when the Gate signal is off.
- **NOTES ENV**: Enables the triggering of the Envelope by notes.If GATE is also enabled for the Envelope both signals need to be active to start the Envelope.
- **NOTES SUM**: Enables the gating of the Sum (output) signal by notes. The ATT (Attack) and REL (Release) times of the GATE section will also apply. If GATE is also enabled for SUM both signals need to be active to open the Sum output.
- **GATE EXC**: Enables the gating of the Exciter signal by the audio-triggered GATE. The ATT (Attack) and REL (Release) times of the GATE section apply here.If NOTES is also enabled for the EXCITER both signals need to be active to open the EXCITER output.
- **GATE REL**: Enables the damping of the Modal Bank by the closing of the GATE. The damping amount is set by the RELEASE knob in the DECAYS section. If REL by NOTES is also enabled, the signal will dampen when either the Gate signal is off or when MIDI notes and NOTES 1-6 are off.
- **GATE ENV**: Enables the triggering of the Envelope by the signal from the GATE detector. If NOTES is also enabled for the Envelope both signals need to be active to start the Envelope.

- **GATE SUM**: Enables the gating of the Sum (output) signal by the audio-triggered Gate. The ATT (Attack) and REL (Release) times of the Gate section apply here.If NOTES is also enabled for SUM both signals need to be active to open the Sum output.

- **(3) ENVELOPE FOLLOWER**: Detects the amplitude of the input signal and provides a control signal for the Macro Controllers MC1 and MC2 and the NOISE level. It uses the following parameters:
  - **ENVELOPE FOLLOWER SMOOTHING**: Smoothing (low-pass) amount on attack and decay of the ENVELOPE FOLLOWER (smoothing time in log scale).
  - **ENVELOPE FOLLOWER DECAY**: Decay time of the peak detector in the ENVELOPE FOLLOWER 20 - 40 - 60 - 80: 10 - 100 - 1000 - 10000 ms
  - **ENVELOPE FOLLOWER SIGNAL METER**: Shows the output signal of the ENVELOPE FOLLOWER.
- **(4) EXCITER**: The audio input signal is passed through the EXCITER section. Therefore you find the IN GAIN parameter and the LEVEL INDICATOR to identify when the EXCITER gate is open. REAKTOR PRISM FX contains the following different parameters:
  - **EXCITER IN GAIN**: Gain (dB) for the input signal used as the EXCITER signal.It has no influence of the levels at the ENVELOPE FOLLOWER and the detector of the Gate.
  - **EXCITER LEVEL INDICATOR:** Exciter level control indicator. This lamp shows if the output of the EXCITER section is open. It can be controlled by NOTES, GATE and the ENVELOPE.
- **(5) MODAL BANK RELEASE LAMP**: This lamp indicates the signals that trigger the RELEASE damping. When it is on the Decay time is reduced to the RELEASE time. It can be controlled by NOTES and GATE.
- **(6) MACRO CONTROLLERS**: Three new MACRO CONTROLLERS Gate: Threshold, Gate: H Time, and Exc: In Gain replace Exc: Env A, Exc: Env R and Exc: Impulse in the first, second and third controller list. These new controller destinations set real-time control and modulation of GATE and EXCITER IN GAIN parameters.
- **(7) NOTES SECTION**: The NOTES section allows you to set the pitch for each of the 6 voices, toggle Chord Latch and toggle Notes 1-6 on or off. The NOTES section contains the following parameters:

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- **NOTE PITCH:** Shows the pitch of MIDI notes on voice 1-6 and allows you to set the pitch by mouse dragging.
- **NOTES BUTTON**: Chord latch and transpose:- Switching it on will latch the MIDI-played voices.- When it is on the voices will not receive MIDI notes. Instead the global tuning (TUNE) will be transposed by the distance between the latest received MIDI note and C3 (=60).
- **NOTE ON/OFF TOGGLE 1-6**: Allows you to toggle a NOTE on/off for voice 6 or to latch a sounding note.
- **(8) ENVELOPE LAMP**: This lamp indicates the signals that trigger the ENVELOPE. It can be controlled by NOTES and GATE.
- **(9) ENVELOPE EXCITER**: Amount of envelope modulation applied to the output signal of the Exciter.0.0: no modulation1.0: full modulation (multiplying).
- **(10) SUM LEVEL LAMP**: Sum level control indicator. This lamp shows if the output of the Mixer section is open. It can be controlled by NOTES, GATE and the ENVELOPE.
- **(11) MASTER MIX**: Crossfades between the input signal of REAKTOR (dry) and the output signal of REAKTOR PRISM FX including the effect chain (wet).

6.2 Overview of REAKTOR PRISM FX Signal Flow

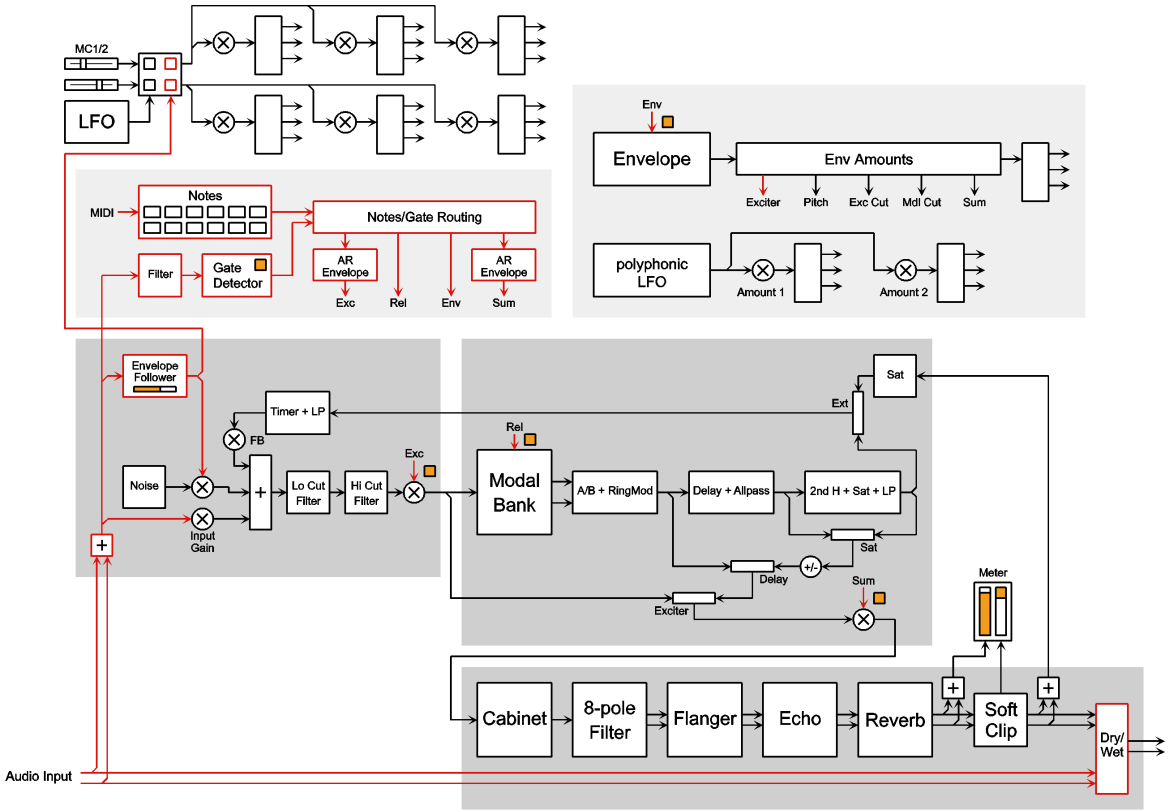

Fig. 6.2 Overview of REAKTOR PRISM FX Signal Flow

The signal flow diagram of REAKTOR PRISM FX reflects the many different functions of the effect. Highlighted in red are the differences between the REAKTOR PRISM and REAKTOR PRISM FX which shows how the built-in Impulse source of REAKTOR PRISM has been replaced by an input for external signals. The Envelope Follower detects the peak amplitude of the input, offering options for Smoothing (low-pass filter on the attack) and Decay on the peak detector signal. The Decay time determines how fast the peak detector returns to zero. The Envelope Follower controls the amplitude of the Noise signal. It can

also be routed to MC1 and MC2 by activating the E.F. switches, providing more options for modulation. When active, the MC positions are not controlled by the fader or the LFO but by the output of the Envelope Follower.
An integral part of the signal flow is the GATE which compares the peak amplitude of the filtered input signal with the adjustable Threshold (THRESH). The Gate switches to the On state when the signal amplitude rises above the Threshold and to the Off state when below the Threshold and the hold time (H TIME) has passed. For modulation of the Exciter and Sum levels the gate signal is shaped by the Attack (ATT) and Release (REL) parameters. The Gate is a valuable tool to isolate drum beats or a range of peaks from an input signal. A low threshold rate will create space to expand the Modal Bank's resonant ringing or reverberation. There are four destinations that can be controlled by the Gate signal or the Note-On states of the voices or a combination of both:

- Exciter (EXC) = the level at the output of the Exciter section (ATT and REL apply)
- Release (REL) = the Release damping with the Off state
- Envelope (ENV) = the state of the Envelope
- Sum = the level at the output of the Mixer section (ATT and REL apply)

If both buttons from NOTES and GATES are enabled for a destination, the result is a combination of the Note states and the state of the Gate. If they are both off the Exciter and Sum levels are not attenuated.
The Notes section imparts a very musical edge to REAKTOR PRISM FX further enhancing it's unique approach. This is achieved by it's ability to receive MIDI note on/off messages just like a polyphonic instrument. The sound of REAKTOR PRISM FX depends very much on the activity and pitch of the voices. The MIDI note names of the six voices are conveniently displayed at all times allowing them to be edited using a mouse or via MIDI input. The assignment to each of the six voices is displayed in the NOTES section. The numbers in the first line display represent the pitch of the last note received. The row of buttons in the second line represent the on/off state. The pitch can be set and altered by holding the mouse button and dragging. Clicking on the button of a MIDI-played voice will latch (hold) its state. Inactive voices can be toggled on or off via a mouse too. It is important to know that when MIDI notes are received their velocity is applied and will be memorized when latched, but, if you activate voices by mouse their velocity is set to the default value of 0.8 (102). The most interesting function of the NOTES section is the Chord button which when engaged will latch sounding notes. When the Chord button is on the incoming MIDI

note events are interpreted in a different way: they are not assigned to the voices but instead the pitch of the last note is used to transpose all voices simultaneously. The result of the transposition is displayed in the TUNE field. This can be useful for playing full chords with a single note of the keyboard.
As with REAKTOR PRISM, if you activate the feedback path you can explore a wide range sounds from subtle signal coloring to extreme experimental effects. In some cases the effected signal could be dominated by self oscillations generated in the feedback loop, creating some very interesting effects. Besides this the Modal Bank, Exciter Filter, Voice Delay, Saturator and effects chain are all additional stages of signal processing, which can dramatically change the sound of the Modal Bank signal and can also be used separately.

6.3 REAKTOR PRISM FX Diagram on View B

By selecting the entry *View B* from the context menu of the Panel of REAKTOR PRISM FX you get to a second view of the effect that provides a diagram of the signal flow. To return to the normal view, select *View A* from the context menu.

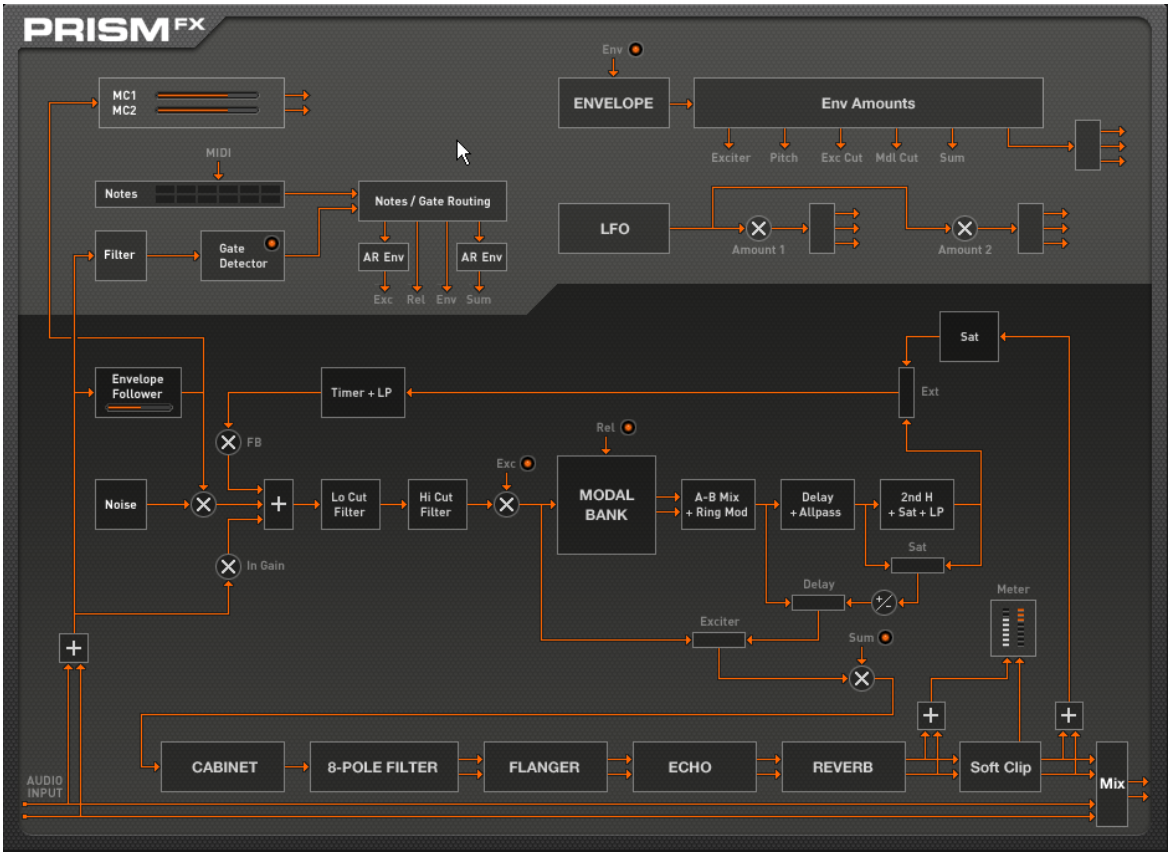

Fig. 6.3 Signal flow diagram on REAKTOR PRISM FX's B View

6.4 Sending MIDI to REAKTOR PRISM FX

By holding notes on your MIDI Keyboard it is possible to change the tuning of the effect applied to the incoming signal. This can be used live for making impromptu pitch changes or more precisely when sequenced. MIDI notes can be recorded to your DAW however, sending MIDI to an effect isn't always that straight-forward in all hosts so read the sections below for a little help.

To hear sound from REAKTOR PRISM FX you must play notes via a MIDI instrument or toggle notes on for at least one voice in the NOTES section. Please also check the THRESH (threshold) level in the GATE section as a high THRESH level may also prevent the effect from being heard. For more information please refer to the parameter descriptions above.

6.4.1 Ableton Live

In Ableton Live, insert the REAKTOR PRISM FX as an effect. Chose or create another MIDI track. Click on the *MIDI To* menu on the MIDI track and select the track where the effect was inserted. If there are more than one MIDI-enabled effects on the original track, you must select the specific plug-in you want the MIDI to go to from the drop-down menu below the *MIDI To* selection. Make sure you are recording enabled on the new MIDI track, or are using Monitor *In*, to send the MIDI to REAKTOR PRISM FX.

Please refer to the documentation provided with Ableton Live for more information on setting up MIDI for virtual instruments and effects. You may also find more support and information specific to your scenario on the Native Instruments REAKTOR website forum.

6.4.2 Logic

In Logic, first insert the plug-in as an audio instrument from the track sub-menu called *AU MIDI-controlled Effects*. Use the side-chain menu in the plug-in window to choose an audio track to route into REAKTOR PRISM FX. The MIDI will come from the sequences on the audio instrument track (or live MIDI input if that track is selected in the Arrange window) and the audio to be processed will come from the side-chain track.

Please refer to the documentation provided with Logic for more information on setting up MIDI for virtual instruments and effects. You may also find more support and information specific to your scenario on the Native Instruments REAKTOR website forum.

6.4.3 Cubase SX / Nuendo

In Steinberg products, first insert REAKTOR PRISM FX as an effect and *activate* the REAKTOR PRISM FX. Select the REAKTOR PRISM FX as the output device for one of your MIDI tracks from the output device menu. The MIDI track will now send MIDI to REAKTOR PRISM FX. To send MIDI, make sure the MIDI track is active, playing a clip or monitoring MIDI in.

Please refer to the documentation provided with Cubase SX / Nuendo for more information on setting up MIDI for virtual instruments and effects. You may also find more support and information specific to your scenario on the Native Instruments REAKTOR website forum.

6.4.4 FL Studio

In FL Studio, add REAKTOR PRISM FX as an insert to the channel you want to process. In the plug-in window, on the arrow next to the folder icon on the left in the header, select *Show MIDI Port* from the drop-down. A new green area appears on the right of the plug-in wrapper's header. Drag on this area to select a specific port number. From FL's main menu select *Channels > Add one > MIDI Out*. On the MIDI Out instrument, select the same port you used for the plug-in. You can now send MIDI on from the MIDI out instrument's track to the plug-in.

Please refer to the documentation provided with FL Studio for more information on setting up MIDI for virtual instruments and effects. You may also find more support and information specific to your scenario on the Native Instruments REAKTOR website forum.

6.4.5 ProTools 8

Create one MIDI or audio channel with the REAKTOR PRISM FX used as an insert. Create a second track for the incoming MIDI. In the new MIDI track's Input/output section on the mixer, select REAKTOR PRISM FX. Now make sure you are recording on the new MIDI track (or use monitor to send MIDI always).

Please refer to the documentation provided with ProTools 8 for more information on setting up MIDI for virtual instruments and effects. You may also find more support and information specific to your scenario on the Native Instruments REAKTOR website forum.

7 Credits

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