



# **BETTERMAKER**

## **Mastering Compressor**

### **Operations Manual**

The Bettermaker crew would like to thank all the people that were deeply involved in the development of our first products, from EQ230P till this day. Thanks to all the Beta-testers that gave us hands-on tips and all people involved in the conceptual stage. We hope we have listened to you carefully so as to produce an ideal tool in the hands of every engineer.

Thank you guys!

I would like to personally thank my development team, the past and the present as their passion to work and bright minds made all that happen. I would not take all my wild concepts to the point they are now without you guys.

Marek.

## **Important Safety Information**

**Do not** operate this unit in the presence of rain, liquids or condensing moisture. Liquid entering the product enclosure presents the risk of electric shock injury.

## **Practical Safety Precautions**

**Do not** operate the Bettermaker Mastering Compressor underwater, uncovered in the rain, in a sauna or anyplace near water. Always be sure to protect the unit from the dust, particles, water, beer, groupies, and stage divers.

# **I. Introduction**

Congratulations on your purchase of the Bettermaker Mastering Compressor - all analog sound with the flexibility of digital control! Welcome to the family! The hybrid audio compressor now in your possession is the result of years of research and development in emerging digital control technologies. The final hand-built result is currently glowing happily in your rack (lucky You). The Mastering Compressor brings the flexibility, ease of use, and instant recall-ability of software plug-ins to the realm of High Fidelity analog processing, like no other analog compressor on the market.

## **The Company**

Addicted to Music has begun in 2004 in Warsaw, Poland as a recording and mixing studio. Long before it was a hardware company, we were deeply involved in the international music and recording scene. This is not a company run by scientists who crunch numbers all day, we are a company run by engineers who live, eat, and breathe music (like You do). We know good sound, and know first-hand what it takes on both sides of the glass to capture the perfect take. We developed the Mastering Compressor to go from the perfect take, and make it even better!

## **Bettermaker Mastering Compressor**

..was designed to have the greatest flexibility of any analog compressor, while still allowing absolute recall and repeatability. We often found the strengths of software plug-ins wasn't their sound, but the ability to quickly audition different settings. This allowed us to make faster, better informed musical choices. The ability to jump back and forth between (sometimes vastly different) settings allowed us to keep a clear vision of the sonic goal in mind, while quickly making decisions on the best setting to use. However, we recognized the sonic superiority of our analog gear compared to their digital counterparts. In countless shoot-outs, the analog versions always won. Since we're a company that cares about better sound over processing speed, our engineers would take the extra time to use a full analog chain because it simply sounds better. We developed the Bettermaker Mastering Compressor to give us the speed of plug-ins, but the fidelity of analog domain.

In the traditional analog world the time spent in the act of having to set and reset potentiometers and buttons to audition between settings often skewed our choices. More time was spent tweaking knobs trying to recover an earlier setting than was spent listening. The limited resolution of the mechanical parts often meant only very coarse adjustments were possible (previously only solvable by very expensive mechanical switches). A difficult situation to say the least, but the greater fidelity, openness, and depth of the analog gear was always worth it to our ears.

Even after years of advancement in digital algorithms, the older analog versions always sounded better. With these goals in mind, we strove to create a hybrid compressor that was the best of both worlds: a true analog compressor based on classic designs, but with the repeatability, fine resolution, and consistency of digital plug-ins. Enter the inspiration for the Bettermaker Mastering Compressor!

We've put a large amount of time, effort, money, and listening tests into the research and development of the analog stages of the Bettermaker Mastering Compressor. We feel that it represents one of the best values, highest fidelity, and newest methods of working available in audio today. We set out to make a product that broke new ground, a compressor with the highest sonic quality, ease of use, and a full pallet of sound shaping tools to allow engineers to make the best-sounding record. In the following pages, we'll share this knowledge, show how the controls work and interact to provide a complete sound - sculpting system.

The Bettermaker Mastering Compressor is a new approach to a well known VCA compressor design. Choosing modern components and design practices over older traditional methods helped maintain the transient response and low noise-floor necessary for today's recording practices. Wherever possible we choose over-spec'd components to ensure trouble free operation and a long product life. Where feasible we increased the gain resolution and frequency range to ensure the greatest flexibility no matter what source (from tracking to 2-bus and mastering applications). Most importantly we listened first, changed, tested and then listened again. We hope you enjoy your Bettermaker Mastering Compressor.

**Now go make some music Better!**

## **II. Important safety information**

### **Before you turn the unit on**

Before turning the unit on for the first time, remember to set it to correct AC voltage (115V or 230V) depending on your location. Always use quality AC power cord with safety (earth) pin and ensure that the power outlet in the wall has the earth connection too. It is important for safety reasons but also helps to keep the unit's noise levels low.

### **Safety Warnings**

Do not operate this unit in the presence of rain, liquids or condensing moisture. Liquid entering the product enclosure presents the risk of electric shock injury.

Do not operate the Bettermaker Mastering Compressor in any place near water. Always be sure to protect the unit from dust, particles, water, beer, groupies, and stage divers.

For normal operation it is not necessary to access the interior of the Mastering Compressor. The only user serviceable part is the AC fuse located in the compartment below the AC mains socket.

Always remove the AC power cord from the socket before attempting to change the fuse (0.63A slow-blow fuse).

### III. Construction of the Mastering Compressor

The sound of the Compressor is of course based on the quality of its analog audio path. But all the control and user interactions are performed in the digital domain. This allows us to incorporate options and possibilities not found in any standard analog compressors:

- Save and recall presets from on-board memory (400 slots available)
- Instant reset of all parameters
- Rapid, precise and repeatable adjustments
- Precisely linked stereo operation with the ease of a single control
- DAW automation and recall of all available parameters

#### Front panel and LCD touchscreen

The front panel of the Mastering Compressor is build around big **LCD touchscreen**, that allows you to control almost all functions available in the device. Apart from that, you can also monitor input/output levels, amount of gain reduction applied by the compressor or store and recall presets using on-screen QWERTY keyboard.



On both sides of the LCD screen you will find **five knobs** placed on endless rotary encoders. These knobs are labeled Threshold, P1, P2, P3/P4 and P5/Reset. While the purpose of Threshold knob is self-explanatory the assignment of P1 to P5

knobs may vary, depending on the currently selected screen. P3/P4 and P5/Reset knobs also have push-button functionality. All knobs are velocity-sensitive for fine increment/decrements when turned slowly.

The **ENGAGE** button allows you to turn the audio processing on (the button is lit) or bypass the unit (relay based true bypass). When you turn the Mastering Compressor off completely (hold MAINS switch for 3 seconds) it will still pass unprocessed audio.

## Analog section

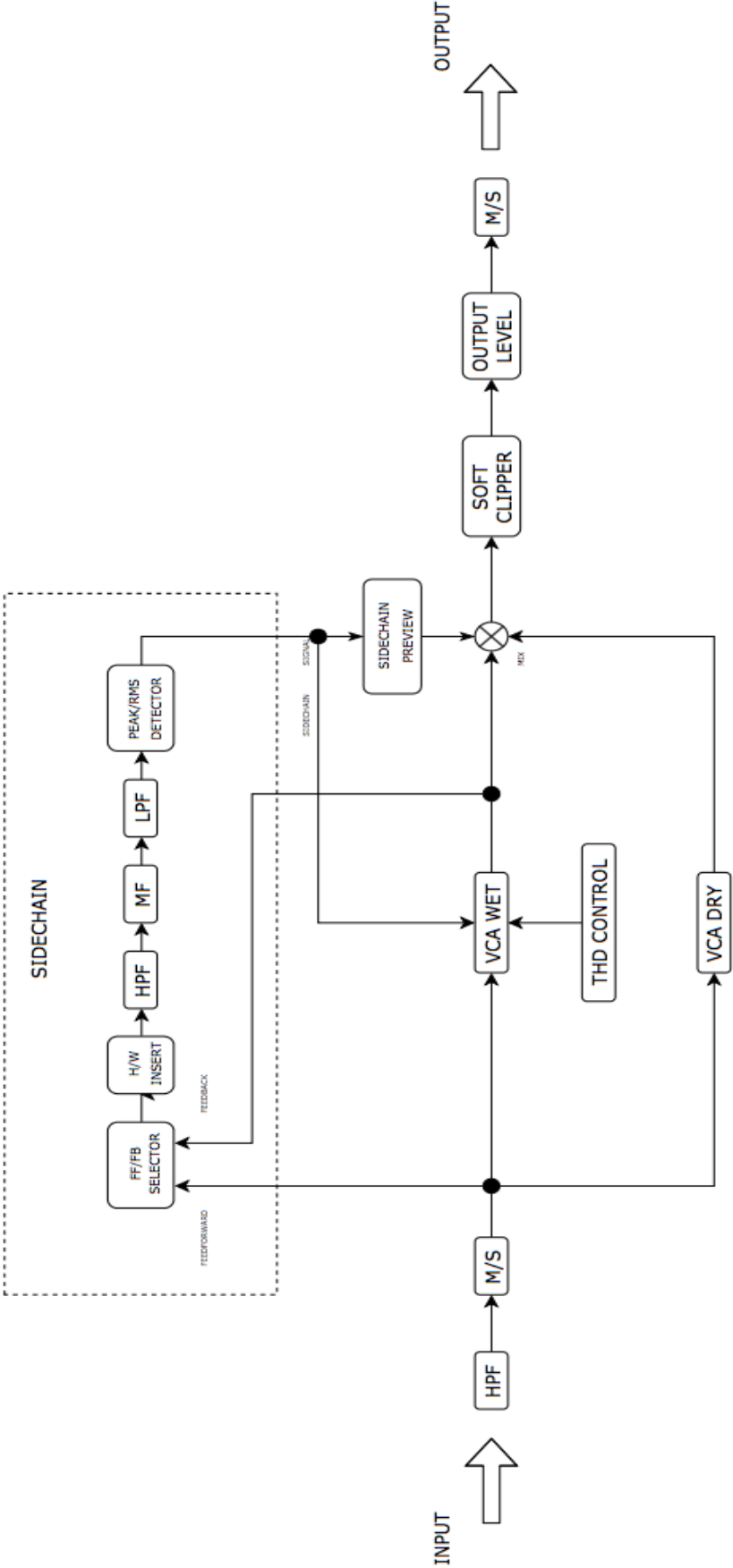
Great care and thought went into the development and implementation of the analog section of the Bettermaker Mastering Compressor. High quality capacitors and low noise op-amps are used in the analog path. Relays were used, whenever creating the shortest path for the audio signal was necessary.

The analog section consist of high quality input/output buffers capable of passing thru high level audio signals, multiple active filters, coloring section based on VCA and Zener diodes, M/S matrix, VCA Compressor (famous THAT chips) with different characteristics, sidechain circuit with external hardware insert and precise gain stage for fine adjustments.

All these modules are controlled by the digital section of the Mastering Compressor, so no mechanical switches or knobs are required to adjust any of the parameters.



# Internal signal path



Incoming signal first runs thru High Pass Filter (HPF) that allows you to cut off unnecessary frequencies prior to further processing. It's all analog HPF with 24dB/octave slope. You can choose the cut-off frequency from 15/20/25/30 Hz or disable HPF completely. Then the signal enters the M/S matrix circuit. From that point you either work with stereo (dual mono) or M/S signal that runs thru VCA (Voltage Controlled Amplifier). Compressed signal is mixed with dry signal (for parallel compression). At this point you can apply some gentle Zener diode based saturation to your mix. Lastly signal goes thru output gain stage and the M/S matrix that converts it back to L-R stereo. For better understanding please check the signal path diagram above.

The sidechain signal that triggers the compressor can be sourced either before or after VCA – this is known as feed-forward and feed-back VCA. Group of analog filters (HPF, parametric filter and LPF) allows you to shape the signal before it goes to peak/RMS detector. The sidechain also features hardware insert point – you can either use external EQ (if the internal is not sufficient enough) or any other audio processor. You can also use the insert to input external sidechain signal that will trigger the compression (ducking effect).

## IV. General Operation

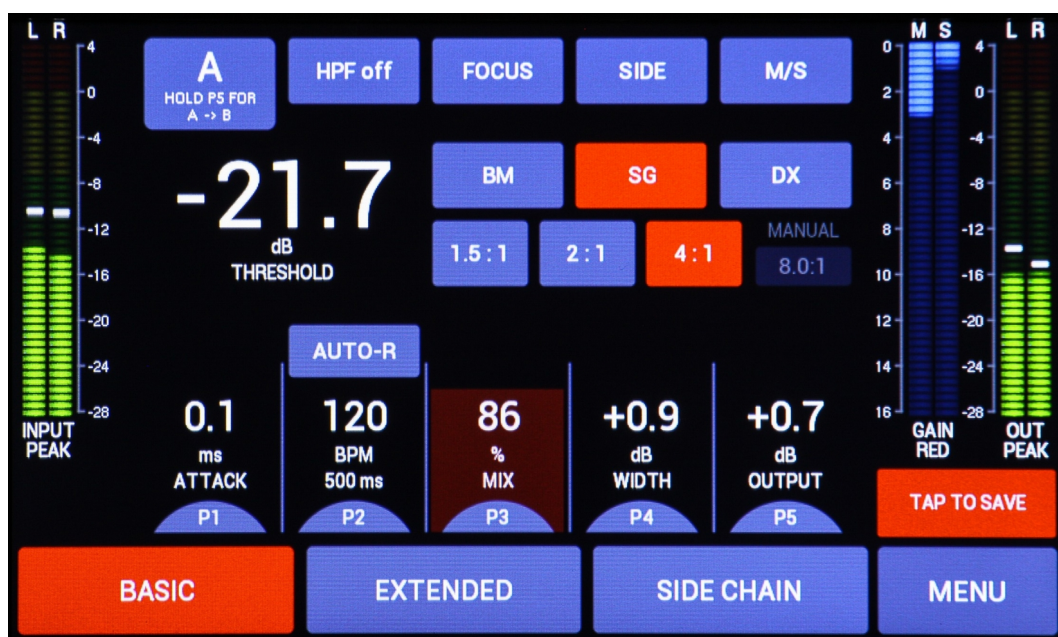
The guide below will walk you thru all the screens and functions available in the Mastering Compressor.

### Connecting the Mastering Compressor to your system

Apart from selecting the correct AC voltage and connecting AC plug to the wall socket (with grounding pin) you will also need:

- to connect the USB LINK to your MAC/PC. It is recommended to use quality USB cable that is no longer than 1.5m or additional USB hubs might be required. The USB LINK will allow you to control the unit from your favorite DAW via VST/AAX/AU Bettermaker control plug-in and perform the firmware update in the future.
- to connect XLR and TRS inputs and outputs. Using balanced, quality cables is essential here to provide best possible signal quality with very low noise floor. Markings on the back of the unit will make this process very straightforward.

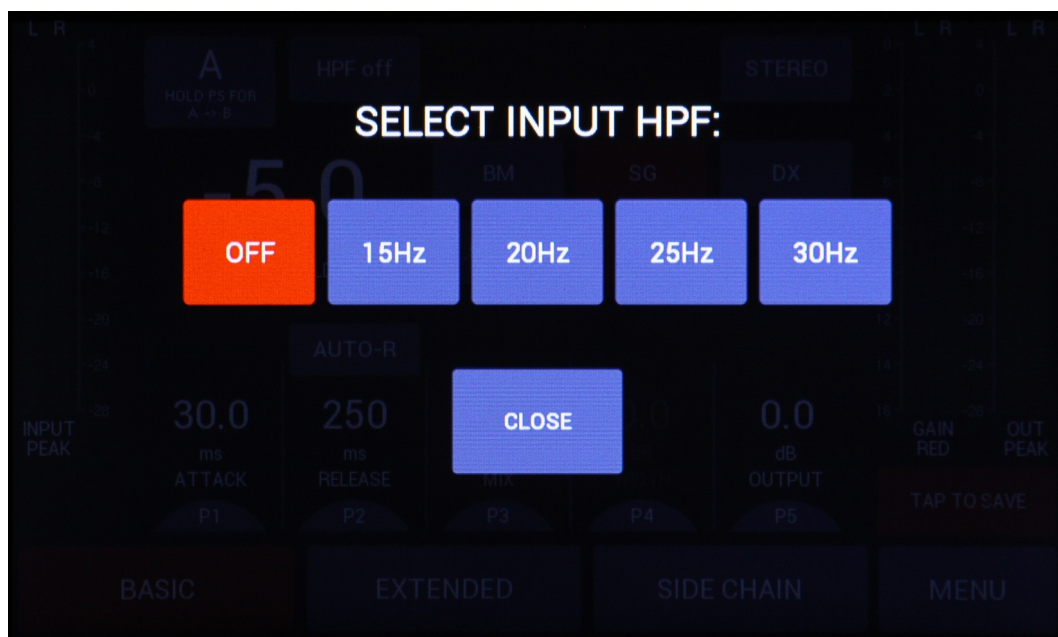
### Main Screen



After powering the unit on, you will be transferred to the main screen called **BASIC** (tap BASIC again to toggle **PLUGIN VIEW** mode). At the bottom you will see the parameters linked to particular knobs on the front of the unit. These parameters will change depending on the tab you select (**EXTENDED** or **SIDECHAIN**). If the value and encoder name is gray, the parameter is not available in currently selected mode (for example Width is only available in M/S mode). P3 and P4 share the same encoder but you can **push the knob** or tap on the screen to choose what you want to adjust (for example MIX or Width; selected parameter is **highlighted with red square**). P5/Reset knob is controlling parameter P5 (Output Gain), but if pressed twice rapidly it will **RESET** all compressor settings to default.

Other parameters can be changed with the touchscreen. From the top left corner: **A/B** comparison – you can quickly switch between set A and B. **Holding P5** for 2 seconds will copy settings from preset A to B or B to A. Please note that only one set will be remembered if you restart the Mastering Compressor – the last used.

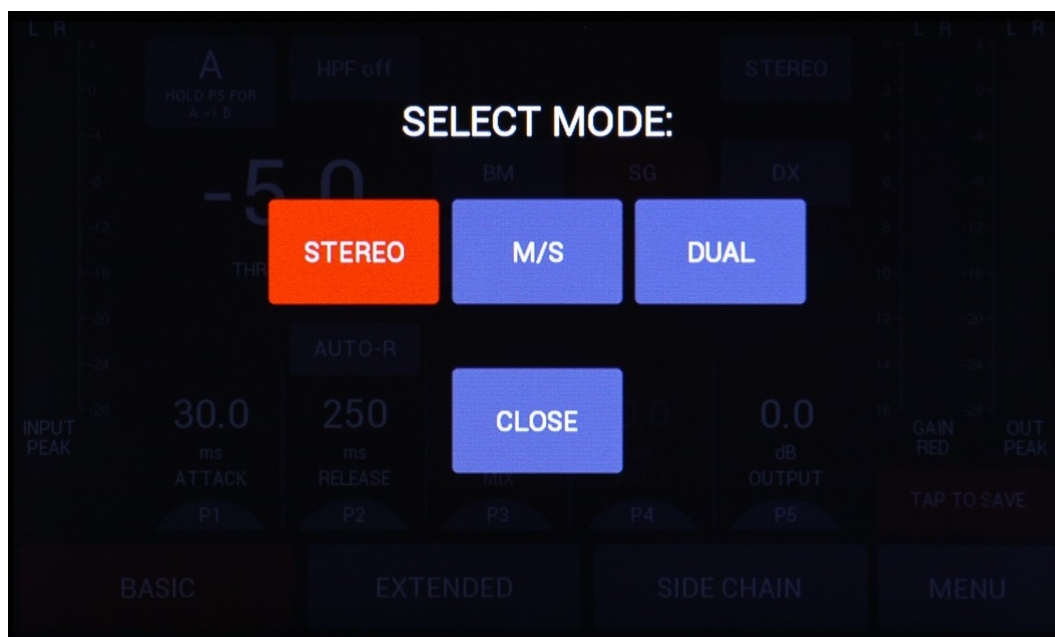
Pressing **HPF** icon opens menu with following options:



This is the **analog 24dB/octave High Pass Filter** section - the very first stage for incoming signal (after input buffers)

Pressing **STEREO** icon allows you to change the compressor mode to stereo (default), M/S or dual mono. In stereo mode all parameters for both channels are linked. This also applies to the VCA detector circuit – it prioritizes the higher level channel (left or right), so the stereo image is more consistent and predictable.

In M/S or dual-mono mode extra two icons appear: **LEFT/RIGHT** or **MID/SIDE** and **FOCUS**. The first one toggles between channels (note that settings on the screen will change if two channels have different settings). **FOCUS** will simply solo selected channel – you can for example solo mid channel in M/S mode to make your adjustments more precise.



The rest of the screen shows the compression threshold setting, compression modes (BM, DX, SG), ratio, gain reduction meter and input/output level metering.

# Compression Modes

The Bettermaker Mastering Compressor can work in three different Compression Modes. Each of them has different functions, ranges and application.

## *BM mode:*

This is our unique approach to compression. This mode is the most versatile one with long attack time available and **variable compression knee**. The attack time in this mode ranges from 5 to 250 milliseconds and the release ranges from 10 to 800 milliseconds. When BM mode is enabled the manual ratio icon activates as the fourth choice – you can assign any ratio from 0.7:1 (**expander!**) to 10:1 in the EXTENDED tab.

In this mode the AUTO-R (automatic release) function is available. The compressor will alter the release time based on the dynamic content of the audio signal. The millisecond/**BPM** conversion is a very useful feature – you can turn it on by tapping below AUTO-R icon.

## *SG mode:*

This mode is inspired by famous buss compressor from well known British console manufacturer. The character and all the settings are similar, but you get additional options like Dry/Wet mix, sidechain filters and dual mono operation. The attack and release times are wider than in the original and you can set them fluently opposed to fixed points. This mode uses fixed soft knee.

## *DX mode:*

The DX mode is inspired by one of the most famous studio “workhorses”. It has fixed attack (40ms) and release (100ms) times and hard compression knee. Although its aggressiveness, people tend to use it on everything from vocals to bass, drums and guitars.



Below the compression mode selector you'll find icons representing **predefined compression ratios** - 1.5:1, 2:1, 4:1 and MANUAL.



BM mode opens the way to very flexible compression settings as the manual ratio is available only in this mode (you can adjust it in the EXTENDED tab).

**TAP TO SAVE** icon gives you quick access to save menu. It also allows you to check if current settings are saved - it will become red if your preset has been modified.



Once you change tab to **EXTENDED** you gain access to more sophisticated functionality. The P1 knob controls **RATIO** with 0.1 step precision. P2 controls the **compression knee** parameter from 1 to 20 dB. By choosing 20dB you will use the most gentle knee available in our Mastering Compressor. Please note that manual ratio and manual knee is available in BM mode only – in SG and DX modes this parameters will be grayed out. P3 controls Gain Reduction Range (**GR RANGE**). This is extremely useful mastering tool that helps you to avoid over-compressed tracks. Let us explain: firstly you have to enable this mode by tapping ENABLE icon. By setting (with P3 knob) the GR RANGE value to 2 dB, the Mastering Compressor will never apply more than 2dB of gain reduction. Thanks to this feature you can increase overall RMS level of the song without squashing it down to death.

Bettermaker Mastering Compressor allows you to use two independent coloring circuits that add harmonics to your mixes. P4 knob allows you to change the VCA's **THD**. This is a very gentle sounding warm analog distortion that is level independent. Something like vintage British console warmth. The next option is the analog clipper based on Zener diodes (located *after* the VCA stage). This circuit is more aggressive and punchy than VCA THD. You can engage it by selecting **CLIP ODD** or **CLIP EVEN** or both. Please note that the **DRIVE** parameter appears. Now the P5 knob controls either DRIVE or OUTPUT gain. Tap on the screen to choose which parameter you wish to adjust. The DRIVE is simply amount of distortion generated by the clipper (it is the gain *before* the clipper). If you switch back to OUTPUT then you adjust the compressor output level again (gain *after* the clipper). If you apply a lot of drive (up to 10dB is available!), lowering the output gain makes a lot of sense – it will help you to avoid the ADC overload in your studio.



Moving to the **SIDECHAIN** screen.



The sidechain circuit is equipped with three independent filters: **HPF** controlled by P1, **parametric** filter controlled by P2, P3, P4 and **LPF** controlled by P5 knob. All these filters can work independently or all together (use **ENABLE** icons to engage each of them). You can shape the sidechain signal in the variety of different ways and turn Mastering Compressor into band compressor or sophisticated de-esser.

Additionally you can enable hardware **INSERT** that is located before internal sidechain filters and plug your favorite EQ or other device into the sidechain. Please refer back to the signal path diagram presented before. Two dedicated **TRS** connectors are located on the back of the unit. You can also use the insert point for injecting external sidechain signal that will trigger the compression (ducking effect).

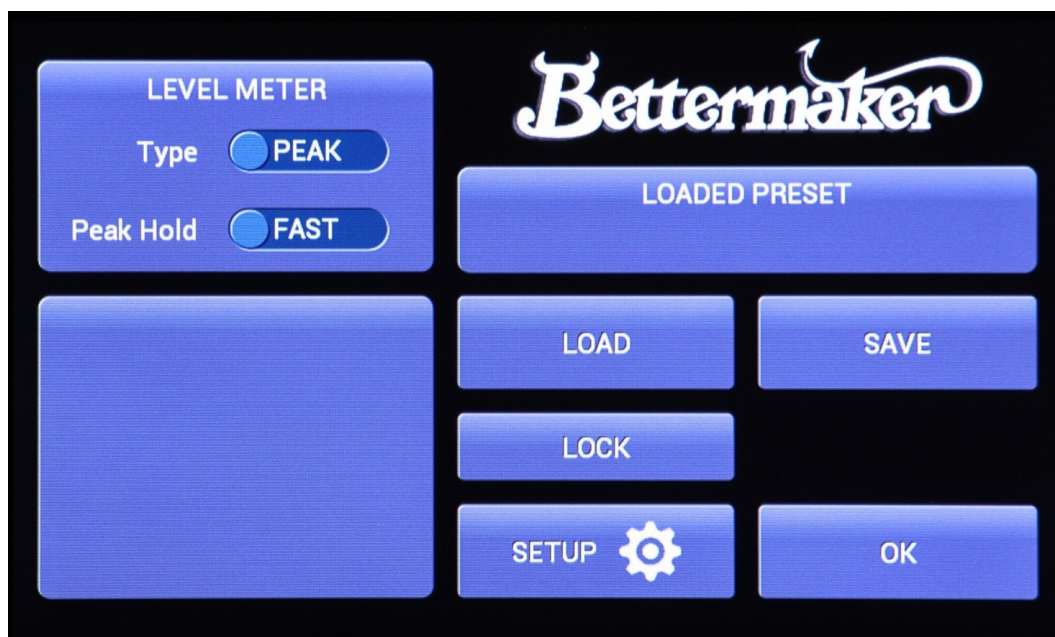
By pressing **LISTEN** icon you will hear the sidechain signal in your monitor speakers. Of course all equalization will be applied. This is a very useful feature, which appears only in the best hardware compressors and let's you precisely control the dynamics of your mix/master. On top of that, if you work in M/S or dual mono mode, you can tap on **FOCUS** icon and listen only to the mid/side/left/right part of the sidechain for even more control.

Awesome!

Next to the LISTEN icon you'll find **FORWARD** and **BACKWARD** feed modes. This selects the source for sidechain signal – *before* or *after* VCA – and allows you to completely change the compression's character. As Forward is known for being punchy and dynamic, Backward compression can produce very interesting type of sound which can be found in Indy Rock like genres.

Here you can also choose if you want the sidechain detector to react to the peaks or to the RMS level of the signal. By selecting **PEAK** the compressor will act faster, allowing every transient to trigger the gain reduction. In **RMS** mode, more dynamic range can be kept, as the compressor will respond to overall change in signal level rather than short peaks. It is very handy when you need gentle mastering compression.

## Main Menu



To enter the MAIN MENU please tap **MENU** on any of the compressor screens. Here you can change the input and output level meter **TYPE** (PEAK or RMS) and the **PEAK HOLD** time constant. In RMS mode, the value in decibels is shown below the input/output level meters. If peak hold is set to **FAST** then the peak value markers will fall within 2 seconds after the signal disappears. In **INF** (infinity) mode, user can tap on one of the meters to reset the peak value markers.

The next section in the menu is dedicated to saving and loading presets. By pressing **LOAD** icon, you will enter presets list. Move **P1 knob** to search the list, and press **LOAD** to recall selected preset.

After pressing **SAVE** in Main Menu, choose free slot by moving P1 knob and press **SAVE** again. Use onscreen keyboard to enter new name for the preset. You can also **RENAME** or **DELETE** unused preset.

On the presets list you may notice the **RED or GREEN dot** beside the number and name. The dot shows up when the preset was loaded or saved. If you've loaded a preset, but haven't made any changes to it, the dot will be **GREEN**. But if any changes have been made, the dot will turn **RED**. You will also get **UNSAVED!** warning on every screen of the Mastering Compressor – this is a sign that you should save your preset again before you turn the unit off.

You can lock all the compressor controls by pressing **LOCK** icon in the main menu. This allows you to avoid accidental changes made by your coworkers, kids, cats, dogs or wife :) *To unlock the unit, hold P3/P4 and P5/RESET knobs together.*

## Settings



Press **SETUP** icon in the Main Menu to enter settings window. Here you can adjust the **BRIGHTNESS** of the screen (touch and drag the virtual slider on the screen), check the firmware/hardware version of your unit, see the number of power cycles (how many times the unit was turned off and on), serial number of your Mastering Compressor and its up time.

To update the Mastering Compressor's firmware press the **FIRMWARE UPDATE** button and follow on-screen instructions.

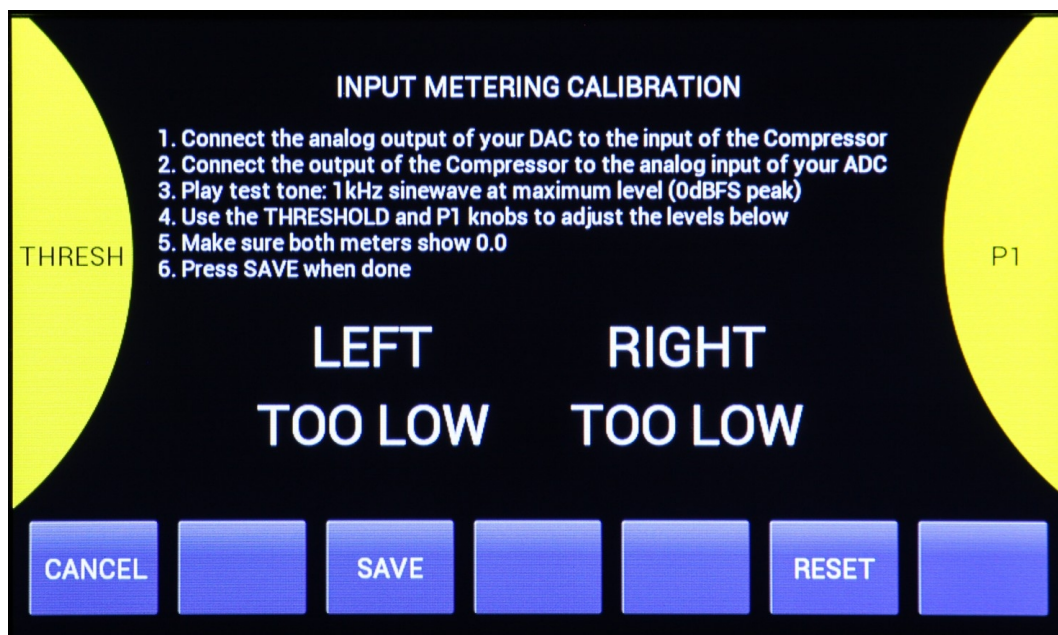


If you wish to clear the presets memory, simply tap on **CLEAR MEMORY** and confirm your choice. You will see the progress on the screen. When the procedure is over the unit will restart itself.

## **IMPORTANT!**

**If you decide to erase the presets memory, you need to remember that you cannot undo this action. All your settings and presets will be gone!**

For your convenience, **METERING INPUT and OUTPUT CALIBRATION** let's you match the levels shown by the Mastering Compressor with the levels shown by your AD/DA converter. In other words: you need to show the compressor where the digital 0dB is, so the reading will be accurate. Please use on-screen instructions to perform the calibration. Please note that changing calibration values doesn't change the audio gain staging at all – it only affects input and output level metering.



## V. Product Specification

- advanced analog VCA compressor with PEAK or RMS detection and switchable forward/backward feed
- all parameters are digitally controlled via front panel and/or DAW (with dedicated plugin)
- stereo, dual-mono and mid/side operation modes with focus and sidechain preview function
- our famous BM, SG and DX modes - adjustable 15 - 30 Hz high pass filter at the compressor input
- dry/wet MIX control for parallel compression
- HPF, LPF and fully configurable parametric filter in sidechain with option of hardware insert
- adjustable drive (for odd/even clipper) and THD function for harmonically rich sound
- Range Setting - limit the maximum amount of gain reduction!
- on-board measurement of PEAK/RMS levels
- 100% analog audio signal path
- total recall and A/B comparison
- five-inch capacitive touchscreen with backlight
- USB connectivity with MAC/PC

## Functions:

- Threshold: -35dB to +5dB (40dB range)
- Attack: 0.1 – 250 ms
- Release: 10 – 2000 ms
- Ratio: Variable 0.7:1 – 10:1
- Knee: Variable 0 – 20dB
- Output gain: -5dB to +15dB
- Width (in M/S mode): -8dB to +8dB
- GR Range: Variable 0.1dB – 20dB / off
- Input HPF: Off/15/20/25/30 Hz (24dB/oct)
- THD + DRIVE: off/odd/even
- Sidechain HPF: off – 370Hz (12dB/oct)
- Sidechain LPF: 2k – 18k / off (12dB/oct)
- Sidechain MF gain +/- 15dB
- Sidechain MF freq 0.5 – 10kHz
- Sidechain MF Q 0.2 – 8
- Sidechain Feed: Forward/Backward
- Sidechain Detection Type: RMS/PEAK

## **Technical specification (may change without notice):**

- Frequency response 10Hz to 22kHz (+/- 0.2 dB)
- Dynamic range: 106dB (+23dBu, 22kHz BW)
- S/N ratio: 87dB (A-weighted, +4dBu, 22kHz BW, unity gain)
- Crosstalk: -83dB @ 1kHz, +18dBu, channel-to-channel
- CMRR: max 85 dB @ 3 kHz, min 52 dB @ 20Hz, 20 kHz BW
- THD: 2nd: < 0.06%, 3rd: < 0.01%; 4th: < 0.006%; (+4 dBu, 20-20 kHz, unity gain, THD and CLIP disabled)
- balanced stereo input (XLR), 23dBu max input level (THD < 0.2%)
- balanced stereo output (XLR), 23dBu max output level (THD < 0.2% into >2kohm)
- Input impedance (differential): 48k $\Omega$  (for balanced signal)
- Output Impedance: 50 $\Omega$  + 50 $\Omega$  (electronically balanced)
- 2U enclosure, 230mm deep (Mastering Compressor)
- universal 100 - 240V power supply designed by Bettermaker
- Maximum power consumption: 25W
- Shipping weight: 5.5 kg



## **VI. RMA Warranty / Contact info**

### **Warranty:**

Addicted to Music warrants to the purchaser of a new Bettermaker Mastering Compressor that the unit is free from manufacturing defects in materials and workmanship for a period of one (1) year from the original date of purchase.

Addicted to Music's sole obligation under this warranty shall be to provide, without charge, parts and labor necessary to remedy defects, if any, which appear within one (1) year from the original date of purchase.

All warranties expressed or implied by Addicted to Music, including warranties of merchantability and fitness, are limited to the period of this warranty.

Addicted to Music is not responsible for indirect, incidental or consequential damages arising from the use or failure of this product, including injury to persons or property. This warranty does not cover damage due to: misuse, abuse, modification, accident, or negligence.

The warranty does not apply if the unit is connected, installed or used otherwise than in accordance with the instructions furnished by Addicted to Music.

If the equipment requires warranty repair, return authorization must be obtained from Addicted to Music prior to shipment. Equipment should not be shipped until return authorization and proper shipping address is obtained from Addicted to Music. The equipment (with all its component parts and connecting cables) must be suitably packaged, including a note with the registered owners name, return address, telephone number, and description of the reason for return. The owner is responsible for all shipping charges, and it is suggested that the shipment be insured for its full value.

This limited warranty is in lieu of all other warranties, expressed or implied, and no representative or person is authorized to represent or assume for Addicted to Music any liability in connection with the sale of our products than set forth herein.

## Contact information:

In case of failure, please contact Addicted to Music for RMA information to have your unit repaired under warranty.

Addicted To Music

Phone: +48 604 649 220

Email: [info@bettermaker.eu](mailto:info@bettermaker.eu)

Web: [www.bettermaker.eu](http://www.bettermaker.eu)

## Final Words

We hope you enjoy your new Bettermaker Mastering Compressor! If you have any thoughts, ideas, concerns, notions, or brilliant revelations you would like to share about our products, please bring them to our attention at [info@bettermaker.eu](mailto:info@bettermaker.eu).

Happy Better Making!

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