



BETTERMAKER
Bus 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.

I. Introduction

Congratulations on your purchase of the Bettermaker Bus 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 Bus 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 Bus Compressor to go from the perfect take, and make it even better!

Bettermaker Bus 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 Bus 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 Bus 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 Bus 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 Bus 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 Bus Compressor.

Now go make some music Better!

II. Important safety information

Before you turn the unit on

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 Bus 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 Bus Compressor.

III. Construction of the Bus 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:

- recall last unit state after reboot
- 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

The front panel of the Bus Compressor is build around **eye-catching LED matrix display**, that allows you to monitor almost all functions available on the device, as well as input/output levels and amount of gain reduction applied by the compressor.



Apart from the LED matrix you will find **six knobs** placed on endless rotary encoders. These knobs are labeled SET, THRESH, ATT, REL, GAIN and USER. All knobs are velocity-sensitive for fine increment/decrements when turned slowly.

SET and USER knobs also have push-button functionality. The **USER** knob can be set for **one of four parameters**: ratio, wet/dry mix, sidechain HPF and THD amount.

The **ENGAGE** button allows you to turn the audio processing on (the button is lit) or bypass the unit (relay based true bypass). When the unit is powered down (power unit disconnected), it will pass unprocessed audio.

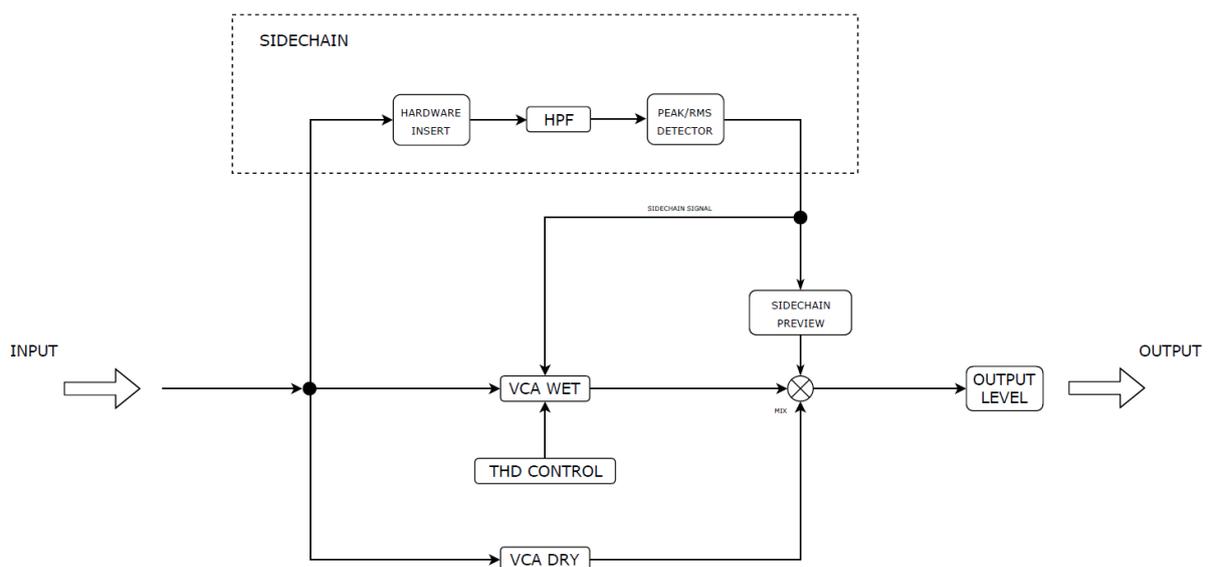
Analog section

Great care and thought went into the development and implementation of the analog section of the Bettermaker Bus 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, VCA Compressor itself (famous THAT chips), THD section, sidechain circuit with external hardware insert and precise gain stage for fine adjustments.

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

Internal signal path



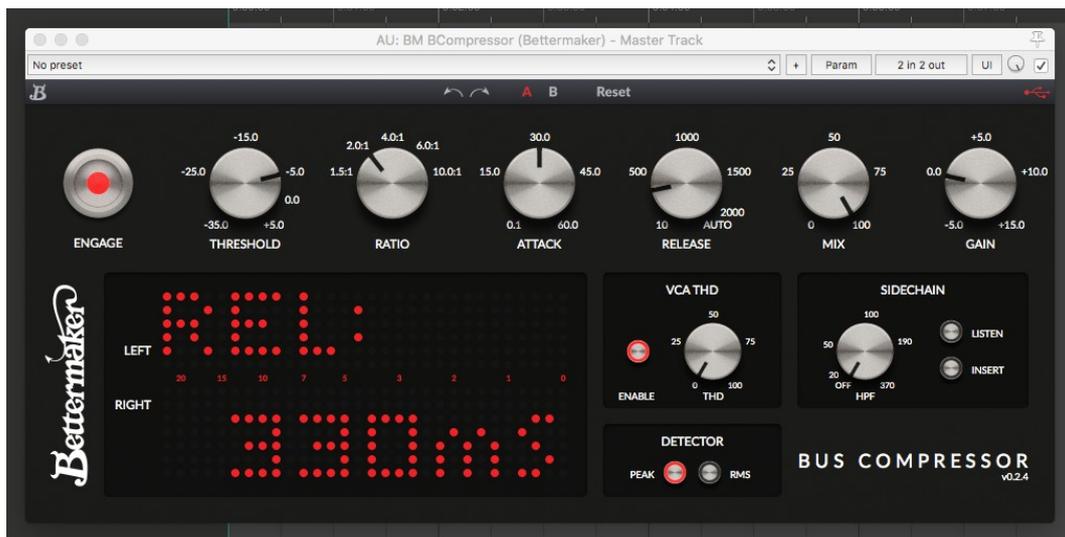
IV. General Operation

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

Connecting the Bus Compressor to your system

Apart from connecting the AC-DC PSU to the unit 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.

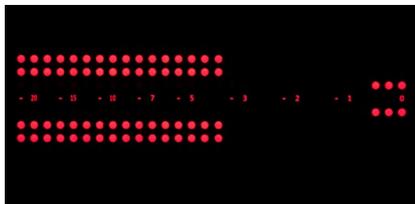


- to connect XLR and TRS inputs and outputs. Using balanced, quality cables is essential here to provide best possible signal quality with very low noise floor. Markings on the back of the unit will make this process very straightforward.

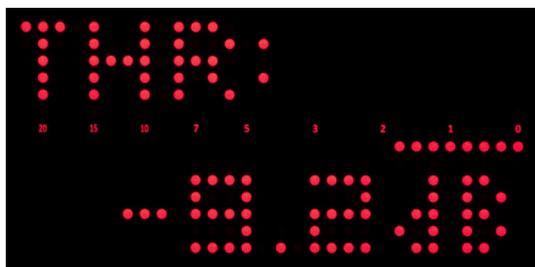


Level and gain compression metering

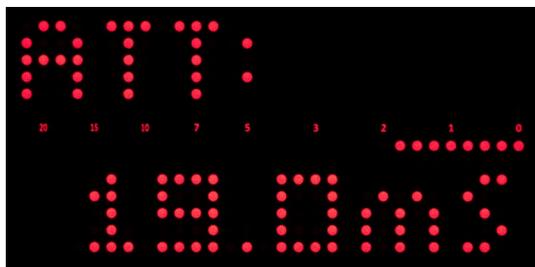
By pressing **SET knob** you can switch between two metering displays: **LEVEL + GR** metering or **GR** (gain reduction) meter only.



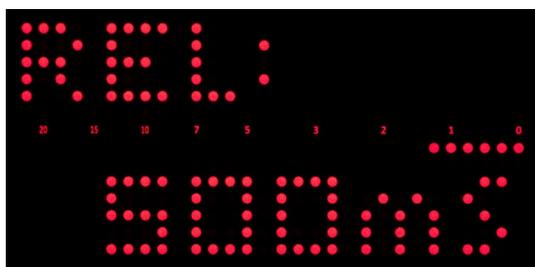
Using main rotary encoders



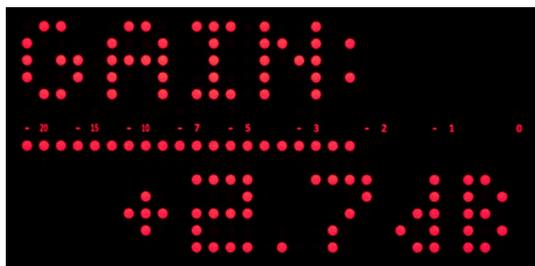
THRESH – adjust compression **threshold** from -35dB to +5dB.



ATT – adjust compression **attack** time from 0.1 to 60ms



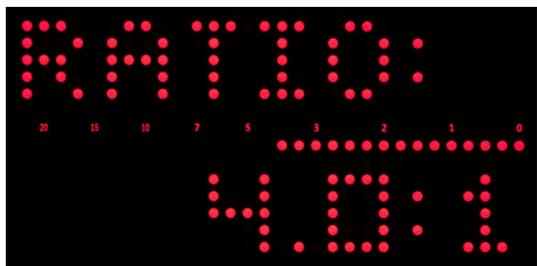
REL – adjust the **release** time from 10ms to 2s. Turn the encoder further and you will enable **AUTO RELEASE** mode.



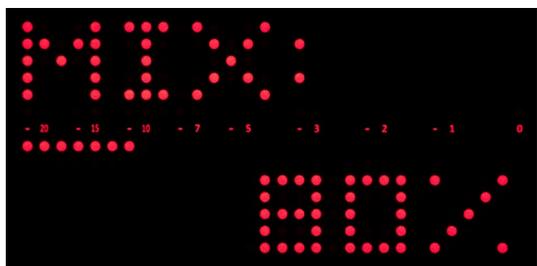
GAIN – set the compressor **output gain** (make-up gain) from -5dB to +15dB

Using USER rotary encoder

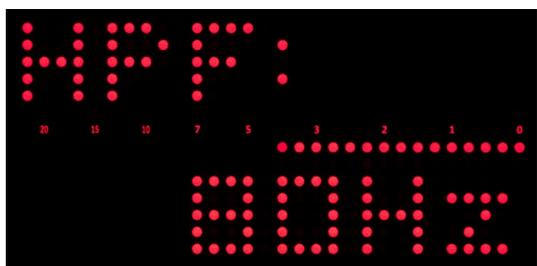
As mentioned before the USER knob can be set (with the SET knob) to adjust one of the following parameters:



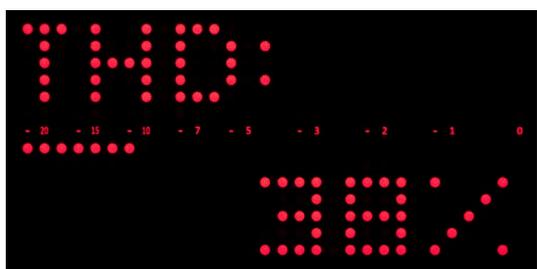
RATIO – choose from 1.5, 2, 4, 6 or 10:1 values.



MIX – adjust balance between compressed and dry signal. 0% means that only uncompressed signal is passed thru (but you can still apply the output gain)



HPF – adjust the sidechain high pass filter from 20 to 370 Hz. Turn below 20Hz to disable HPF.

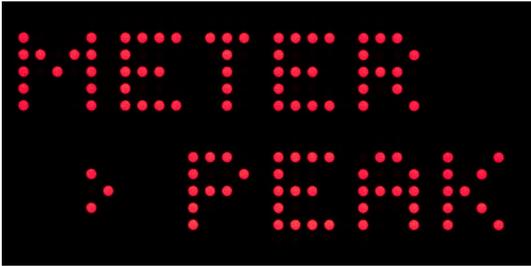


THD – adjust the amount of level independent harmonics added to the compressed signal. Set to 100% to get rich, warm and pleasant tone.

Double press the USER knob to reset all the parameters to default values. Confirmation will appear on the screen with the option of selecting YES or NO. Choose the right one with USER knob and press it to accept.

Using SET knob and menu

Almost all configurable settings are available under only one encoder with push-button action. Rotate the SET knob to scroll thru all available settings and actions. Press SET button once to change selected parameter or execute selected action.



If you see > mark beside any of the options that means this option is active. For example: level metering shows Peak Value. If you wish to display RMS values instead, turn SET knob until you see METER RMS and press SET knob once. Now the > appears beside RMS option.

Here is the list of all available settings:

- METER: PEAK or RMS – selecting RMS will allow you to see the average (instead of peak) level of the signal passing thru the compressor.
- METER: IN or OUT – metering will show either input or output level (after the output gain stage)
- USER: RATIO, MIX, HPF, THD – **select the action for the USER knob.** Press SET knob once to assign new action for the USER knob.
- DETECT: PEAK, RMS – select the sidechain signal detection circuit: PEAK mode will make the compressor more sensitive for quick transients, while RMS for average signal level changes.
- KNOBS: FREE, STEP – STEP mode mimics stepped controls for attack and release times, well known from classic hardware units.
- SAVE TO DEF (Save to default) – make current settings your default starting point. *NOTE: This option is available in firmware v1.7 and above.*

- LED: DIM – select this option to dim the LED matrix. Select it again to set full brightness back.
- SN:2 1.6/C – here you can find some information about your Bus Compressor. Serial number (2), firmware version (1.6) and hardware revision (C).
- F/W UPDATE – the unit will enter firmware update mode. To activate please press SET knob while holding ENGAGE button. “BOOT..” will show on the LED matrix. Follow the instructions listed in PC/MAC firmware update app.
- SYSTEM REBOOT - To perform please press SET knob while holding ENGAGE button. This will restart the Bus Compressor. Please note that the unit will not be reset to its default values, so all your settings will be kept.
- USB: RX/TX/NONE – shows the status of the USB connection with host (DAW). Please check your USB connection if “NONE” is displayed.
- MEM ERASE - To perform please press SET knob while holding ENGAGE button. This will erase internal memory and bring the unit back to its default state. All settings (including defaults) will be erased. Please note that you can not undo this action.

V. Product Specification

- advanced analog stereo VCA compressor with PEAK/RMS detection
- all parameters are digitally controlled via front panel and/or DAW (with dedicated plugin)
- dry/wet MIX control for parallel compression
- sidechain high pass filter with hardware insert and preview function
- adjustable THD for harmonically rich sound
- on-board measurement of PEAK/RMS levels
- 100% analog audio signal path
- total recall and A/B comparison from your favorite DAW
- LED matrix display and six encoders with push-button action for ease of control
- USB connectivity with MAC/PC

Functions:

- Threshold: -35dB to +5dB (40dB range)
- Attack: 0.1 – 60 ms
- Release: 10 – 2000 ms + AUTO
- Ratio: 1.5, 2, 4, 6, 10:1
- Knee: 20dB
- Output gain: -5dB to +15dB
- Sidechain HPF: off – 370Hz (12dB/oct)
- Sidechain Feed: Forward
- Sidechain Detection Type: PEAK/RMS

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 Ω (for balanced signal)
- Output Impedance: 50 Ω + 50 Ω (electronically balanced)
- 1U enclosure, 230mm deep (Bus Compressor)
- universal 100 - 240V HQ AC-DC converter
- internal power supply designed by Bettermaker
- Maximum power consumption: 25W
- Shipping weight: 4 kg

VI. RMA Warranty / Contact info

Warranty:

Addicted to Music warrants to the purchaser of a new Bettermaker Bus 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

Web: www.bettermaker.eu

Final Words

We hope you enjoy your new Bettermaker Bus 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.

Happy Better Making!

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