

MULTIBAND MASTERING PROCESSOR

ENDORPHINES[®]
GOLDEN MASTER 3U / 1U

FIRMWARE V.4.22

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WARRANTY

1-year warranty is guaranteed from the product's purchase date in case of any manufacturing errors or other functional deficiencies during runtime.

The warranty does not apply in case of:

- damage caused by misuse
- mechanical damage arising from careless treatment (dropping, vigorous shaking, mishandling, etc.)
- damage caused by liquids or powders penetrating the device
- heat damage caused by overexposure to sunlight or heating
- electric damage caused by improper connecting

The warranty covers replacement or repair, as decided by us. Please contact us via email for a return authorization before sending anything. Shipping costs of sending a module back for servicing is paid by the customer.

VISIT US

<https://endorphin.es>

<https://youtube.com/@endorphines>

<https://facebook.com/TheEndorphines>

https://twitter.com/endorphin_es

<https://www.instagram.com/endorphin.es/>

<https://www.modulargrid.net/e/modules/browser/vendor:167>

For technical requests: [**support@endorphin.es**](mailto:support@endorphin.es)

For dealer / marketing inquiries: [**info@endorphin.es**](mailto:info@endorphin.es)

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It is doing business as FURTH BARCELONA, S. L. (EU VAT ID: ES B66836487).

INTRO

Golden Master is a 6hp multi-band processor, available in both 1U and 3U format, that takes inspiration from studio mastering and radio loudness units from the 1990s and gives control over the **EQ, compression** and **mid/side** processing: **all three available at the same time.**

Thanks to the 16-bit/96kHz audio fidelity, you will get incredible processing power. It features three bands - low, medium, and high - each handling a distinct portion of the audio spectrum. These controls feature a single knob that both boosts and cuts signals. Set the overall loudness limit of your sounds, and the brickwall limiter ensures all your sounds stay in check. This multi-band effect is the perfect end-of-chain module, ensuring that anything you throw at it sounds dynamic and full. The 1U version also features Aux in and Mix out pin headers on the back that let you seamlessly set up your signal chain without the use of patch cables. The extra 6 pin connector can be used to wire the master output straight to the ¼ inch jacks on the Intellijel performance case for even better integration and security for live performances.

→ Video manual: <https://youtu.be/IYiCIMF3fm0>

→ Why do you need a Golden Master: <https://youtu.be/jNi4JB58Q0M>

CONNECTING THE POWER

Before installing a new module in your case, ensure your power supply has a free power header and sufficient available capacity to power the module.

Connect the module directly to the power bus-board with supplied 10-16 ribbon cable like any other eurorack module. Pair of **RED/BROWN** pins on the multicolor ribbon cable corresponds to **NEGATIVE -12 VOLTS.**

Make sure to align the power cable with the '**RED/BROWN STRIPE**' label on the module that corresponds to -12V, to the 10-pin connector and with typically a white line for the 16-pin connector on the bus board.

TECHNICAL SPECIFICATIONS

→ **GOLDEN MASTER 3U:** +12V: 135 mA; -12V: 25 mA; 30mm depth, 6HP

→ **GOLDEN MASTER 1U:** +12V: 125mA; -12V: 12mA; 42mm depth, 22HP

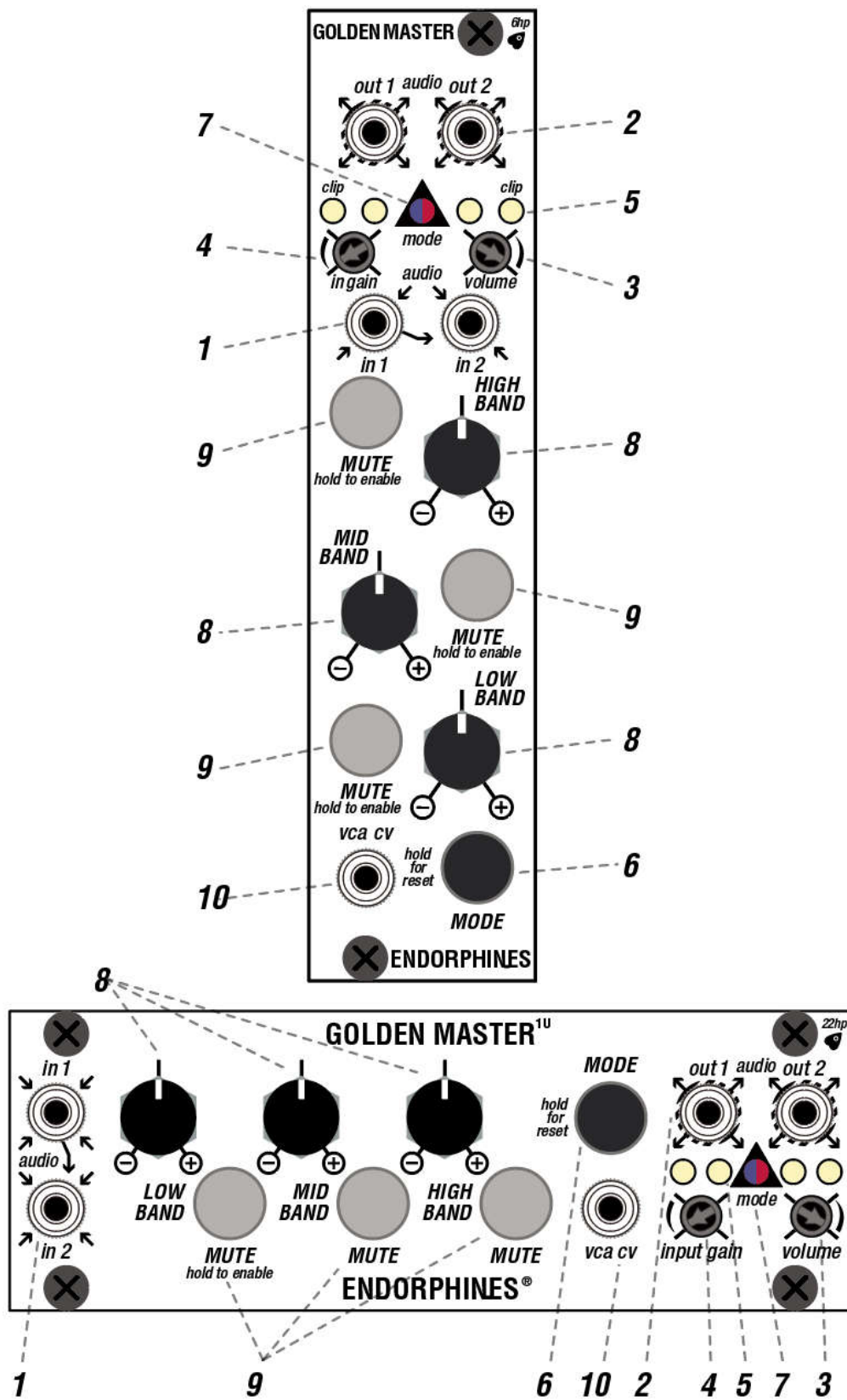
OVERVIEW

Golden Master is a module designed for both live musicians and studio heads that want to take extra care of their modular mix or just give extra punch to specific sounds. Built in end of signal chain limiter makes it a great sound design tool, especially when used for feedback patching. The signal chain is designed in the following way.

First the signal enters the stereo inputs with an additional digital saturation stage to boost the signal to the right level, which can be especially useful to harder hit the compressor. Next we have 3 bands, each with their own EQ setting, mute / compressor enable button, compressor per band, stereo image enhancer and a final limiter.

- Multi-band processor inspired by mastering tools from the 1990s: adds punch and dynamics to your sound
- EQ, Compression, Mid/Side processing
- Three frequency bands with +8 db boost and -20 db cut
- Brickwall limiter sets upper limit of signals, with look ahead latency of 1.5ms.
- 16 bit 96 kHz audio I/O with 32 bits internal processing
- Per-band mute buttons
- Pseudo-balanced outputs allow to use the module between the effects chain with simple eurorack 1/8" unbalanced TS cables but also as a final end-of-chain tool with balanced output like a DI-box.

INTERFACE

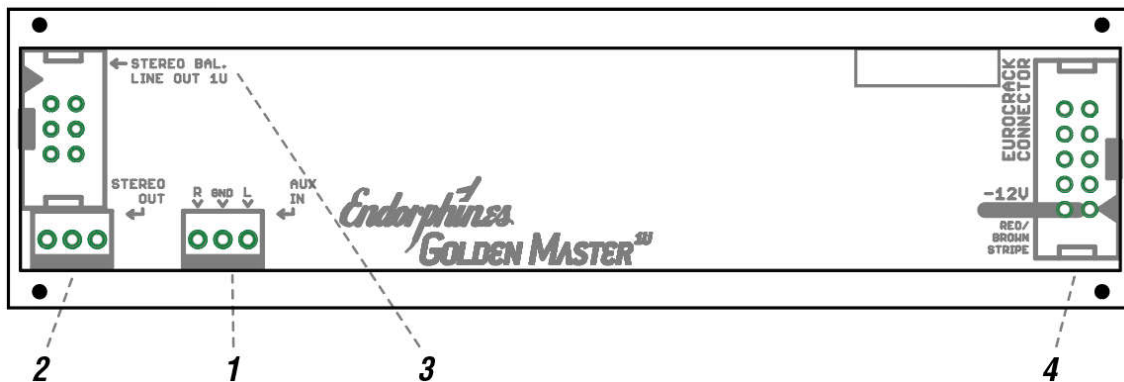


1. **IN LEFT (MONO), IN RIGHT JACKS:** line or modular level left and right stereo audio inputs. *INPUT LEFT* – is *normalised*, i.e. pre-routed → to *INPUT RIGHT* when no audio cable plugged into the *IN R jack*. Accept standard eurorack mono cables 1/8" cables. Modular levels up to +/-6.5V with soft clipping introduced with higher audio amplitudes.
2. **OUT LEFT (MONO), OUT RIGHT JACKS:** final separate left and right stereo audio outputs. Accept standard mono eurorack 1/8" patch cables. Using 1/8" TRS cables can be used as *pseudo-balanced* outputs as a DI-box with better performance with noise cancellation since the ring is connected to ground, catches the same hum which then self-cancels from the audio from the tip.
3. **VOLUME KNOB:** final audio volume: maximum at full CW, silent at full CCW. Maximum at full CW, silent at full CCW. Set it once and forget it.
4. **INPUT GAIN KNOB:** digital input gain saturator up to +10db.
Warning: May increase noise level, but compressor will work more aggressively as the audio will hit the compressor harder. There is no amplification at full CCW.
5. **VU METER LEDs:** 4 LEDs act as a volume unit meters, 2 LEDs per left and 2 right channel. The inner pair of LEDs lights up according to the audio signal. The outer pair of LEDs lights up when signal clipping occurs.
6. **MODE BUTTON:** shortly press to select one of the 3 modes to edit with *MODE LED* (7):
 - **BLUE** (default): EQ or band's amplitude
 - **RED**: Compressor settings
 - **FUCHSIA**: Mid/Side stereo widening (CW) or narrowing (CCW)
 Long press resets the controls to their default (typically clean) states
7. **MODE LED:** red-blue LED shows the currently editing mode with Mode button (6).
8. **LOW / MID / HIGH BAND KNOBS:** depending on the mode, they adjust:
 - **EQUALIZER MODE:** level of each band.
 - **COMPRESSOR MODE:** compressor preset, from soft to heavy.
 - **MID/SIDE MODE:** increase or decrease stereo enhancement per band
9. **MUTE/COMPRESSOR ENABLE BUTTONS:** single press on these buttons works as immediate mute per band. When the band is muted, its button LED is semi-dimmed. You can use it as a live performance feature, but also to precisely set the compressor while muting other bands. Long press (more than 1.5 seconds) enables the compressor and its button LED is fully lit. Only after compressor is enabled on a certain band, you will be able to set its parameter with *LOW/MID/HIGH BAND KNOBS* (8) set to **compressor** mode (6).

- 10. VCA CV JACK:** post-VCA, pre-VOLUME knob CV input. CV range: 0...+5V. 0V corresponds to silence and 5V corresponds to full volume.

REAR CONNECTIONS

GOLDEN MASTER 1U version feature extra rear connections (those are not available in 3U version).



- 1. AUX IN:** accepts audio input from other Mix Bus compatible modules and is basically another stereo input to be mixed with the rest 4 channels.
- 2. MIX OUT** is post-master volume knob audio output, compatible with other Mix Bus modules.
- 3. STEREO BALANCED LINE OUT** is 6-pin connector for the Intellijel Jacks IO v2 board. Let's you route the final post master volume knob output straight to the TRS jacks on the Intellijel cases.
- 4. POWER CONNECTOR** is 10 pin typical +/-12V eurorack power connector.

OPERATION MODES

Golden Master's chain consists of three main functions that can be configured using 3 main LOW/MID/HIGH BAND (10) KNOBS: stereo multiband EQ, stereo multiband Compressor and stereo multiband Mid/Side processing. All modes are working simultaneously, but only one can be edited at a time.

Once the *MODE* is selected (6) each of three knobs (8) changes its functionality per band.

EQ MODE: *LOW/MID/HIGH* knobs adjust each band's volume with 100% in the middle, -20 db CCW and +8db boost CW. Band crossover points are around 300 Hz and 3 kHz.

COMPRESSOR MODE: *LOW/MID/HIGH* knobs adjust each band's compressor settings: From very soft (full CCW) to normal (middle) to heavy (full CW). In total, you can morph per band between five different compressor settings. There is 1.5 mSec look-ahead time, to make the compression more precise.

MID/SIDE MODE: *LOW/MID/HIGH* knobs adjust each band's stereo spread: Mid/Side setting. Middle channel is being extracted and subtracted from the left and right channels of each band. The more you turn the knob CW from the center, the more side information left in the channels. When the knob is turned CCW from the center, the stereo image will gradually become more mono.

HOW EQUALIZER WORKS

Equalizer or simply EQ is a tool used to adjust the levels of different frequencies in the audio. For that purpose the audio is being separated (filtered, or so called isolated) to separate bands which then sum together. Adjusting the volume of each of those bands helps us to cut or boost a certain frequency spectrum allowing you to balance the sound levels, eliminate unwanted frequencies and create a cohesive sound. Cutting the frequencies involves reducing the levels of specific frequencies, while boosting frequencies involves increasing their levels.

GOLDEN MASTER has three bands with band crossover points at around 300 Hz and 3 kHz creating three:

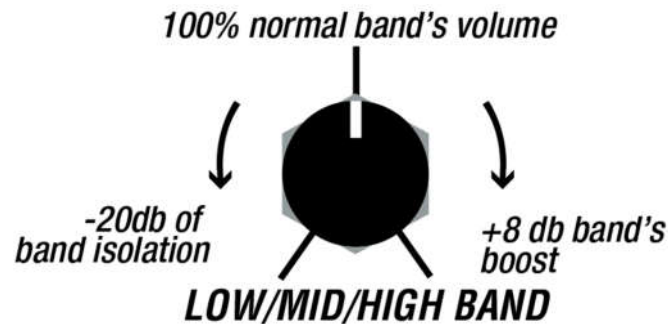
- **LOW** (approx. 20 Hz to 300 Hz),
- **MID** (300 Hz to 3 kHz) and
- **HIGH** (approx. 3 kHz to 20 kHz) bands.

Separating audio spectrum in such parts helps us to adjust most sensitive parts of the audio individually so most of the musical instruments occupy mostly one of the bands each:

→ **HIGH BAND:** bass line, kick drum, bass guitar

→ **MID BAND:** guitar, synthesizers, toms

→ **LOW BAND:** hi-hats, percussion

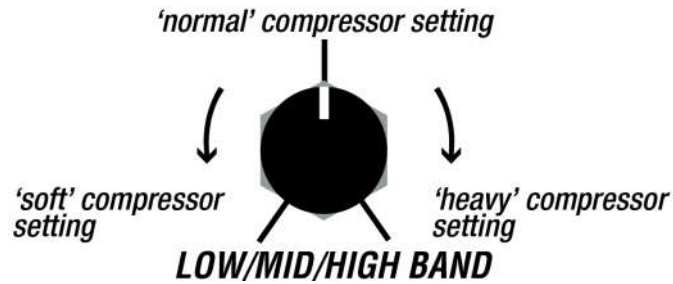


→ *Note:* The level of cut/boost is asymmetric; maximum boost is limited to +8dB, while the cut is extended to -20dB like on a professional DJ mixers.

HOW COMPRESSOR WORKS

To better understand the GOLDEN MASTER, let's have a small theory lesson of how a compressor works. In the audio signal usually we have loud parts (e.g. strong hits on the strings) and quieter parts (notes played with soft velocity). The difference between those parts is called the dynamic range of a signal. What the compressor does is it attenuates the loud parts towards more quiet ones - i.e. reducing the dynamic range of the audio. Of course that depends on the compressor settings such as: ratio, threshold, attack and release. Why we compress is that in the end we get a more smooth and consistent audio. Some audio sources like bass guitar are especially sensitive in dynamic range and therefore need to be compressed especially to be perceived without 'drops' of the volume in the speakers. At the compressor GOLDEN MASTER has an automatic makeup gain to ensure all the gain reduction we've made from the compressor is being compensated. This way you get a balanced audio that also goes through a limiter to ensure all the unwanted peaks or the audio clipping is eliminated to avoid damaging your PA equipment.

The compressor settings values are already picked up to be intuitively chosen when you turn the COMPRESSOR settings per band with *LOW/MID/HIGH* knobs (8) giving you a distinct spectrum of soft to heavy settings.



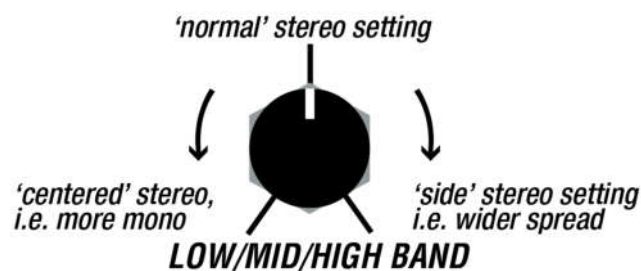
So far, GOLDEN MASTER has six compressors for each stereo pair; LOW, MID and HIGH bands running at the same time.

The compressor settings are tuned for each band separately and are morphed between each other, however the generic settings are as following:

- **ATTACK:** 50 mSec (CCW) to 14 mSec (CW)
- **RELEASE:** 1500 mSec (CCW) to 150 mSec (CW)
- **RATIO:** 1:1.25 (CCW) to 1:4 (CW)
- **THRESHOLD:** -12db (CCW) to -20db (CW).

HOW MID/SIDE PROCESSING WORKS

You may easily enhance the width of a whole mix by boosting the stereo width on the high band. Yet another important use of Mid/Side is to make the bass mono. It's sort of an unwritten law that low-frequency instruments like bass guitar, kick drum, synth bass, should stay in the center of a stereo mix. Otherwise, with the wide stereo image they may be self-canceled or simply lost in the speakers.



On the GOLDEN MASTER the middle channel is being extracted and subtracted from the left and right channels of each band. The more you turn the knob CW from the center, the more side information is left in the channels. When the knob is turned CCW from the center, the stereo image will gradually become more mono.

→ Note: to expect a proper stereo image 'widening', be sure to feed some stereo signal into the GOLDEN MASTER. Feeding only single mono audio (e.g. into IN L INPUT JACK will not give you a significant result as there is simply no difference between the left and right and center/side parts will not be perceived.

FIRMWARE UPDATE

Firmware updates are essential for any digital devices. They bring new features or bug fixes. Feel free to write any bugs, features ideas or improvements to beta@endorphin.es

Update procedure video:

To update the firmware on your Golden Master, first download the latest firmware file once available on ENDORPHIN.ES website:

<https://www.endorphin.es/modules/p/golden-master> or

<https://www.endorphin.es/modules/p/golden-master-1u>

The update procedure is made via audio: either computer or phone will work, we advise you to disable all notifications (flight mode) so that the update is not interrupted.

1. Power OFF your modular system.
2. Hold MODE while powering again, you will see the illuminati LED blink blue.
3. With a simple mono or stereo cable connect audio output from your computer headphone output into AUDIO IN 1 jack of the module.
4. Press PLAY and wait until the audio file finishes its playback (approx. 1 min.). Illuminati LED will quickly blink in blue. The module will reboot automatically.
5. Don't play any other sounds on your computer during the update process. When Illuminati LED flashes RED, the signal is too low or too high. Stop audio playback. Reset the process by pressing the MODE button once. Regulate the signal level and restart the audio playback from the beginning.
6. Video update guide: <https://youtu.be/WKt7FdRGRYI>
7. Enjoy the new features.

→ **IMPORTANT:** to prevent any errors during the audio playback of the firmware, please disable any effects that might be applied to the audio (EQ, room correction etc.)

CREDITS

ENDORPHIN.ES – GOLDEN MASTER 3U & 1U

Module idea, concept and manual by Andreas Zhukovsky
Hardware design, code direction by Andreas Zhukovsky
Core engine programming by BSVi
Manual proofreading and beta testing by Wisdom Water
ENDORPHIN.ES are made in Barcelona, Spain
Follow, like, post and tag us at Instagram: [@endorphin.es](https://www.instagram.com/endorphin.es)

COMPLIANCE

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes / modifications not approved by ENDORPHIN.ES doing business as Furth Barcelona, S.L. could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

CE

This device meets the requirements of the following standards:

EMC: 2014/30/EU EN55032: 2015 ; EN 55103-2: 2009 (EN55024) ; EN61000-3-2;
EN 61000-3-3

Low Voltage: 2014/35/EU EN 60065: 2002+A1: 2006+A11: 2008+A2 :2010+A12:
2011

RoHS2: 2011/65/EU

WEEE: 2012/19/EU