

ENDORPHINES[®]
MILKY WAY 3U & 1U

FIRMWARE V 4.1 TN

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WARRANTY

1-year warranty 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. The customer pays shipping costs of sending a module back for servicing. Device complies with all EU regulations concerning RoHS lead-free manufacturing and WEEE disposal.

VISIT US

<https://endorphin.es>

<https://www.youtube.com/@Endorphines>

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

<https://facebook.com/TheEndorphines>

https://twitter.com/endorphin_es

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

For technical requests: **support@endorphin.es**

For dealer / marketing inquiries: info@endorphin.es

ENDORPHIN.ES is a registered trademark.

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

INTRO

Milky Way is a 16-algorithm stereo effect processor in 6 hp with Meta FX Scan, Pan and Crossfade, VCA with built in saturation and external CV control. Available in both 3U and 1U format, the general functionality is the same, only the 1U version features additional MIX OUT pins (IDC-3) on the back for cable free connectivity.

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.

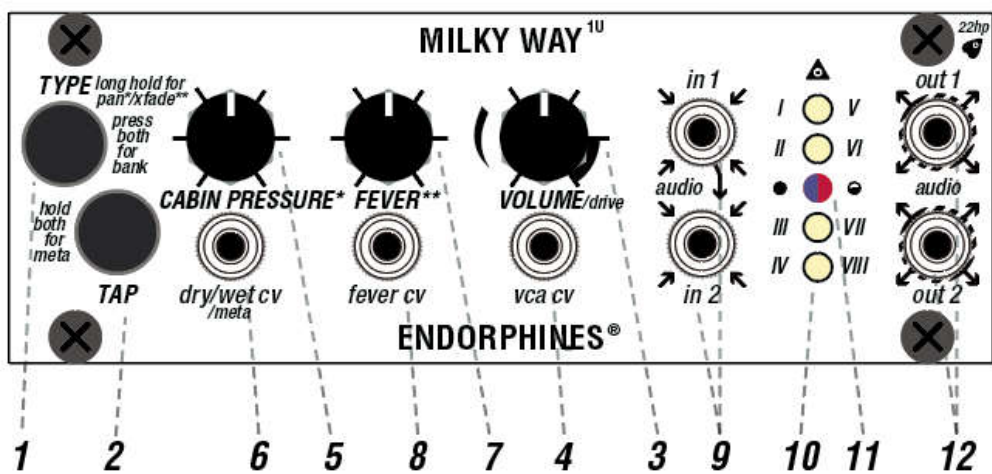
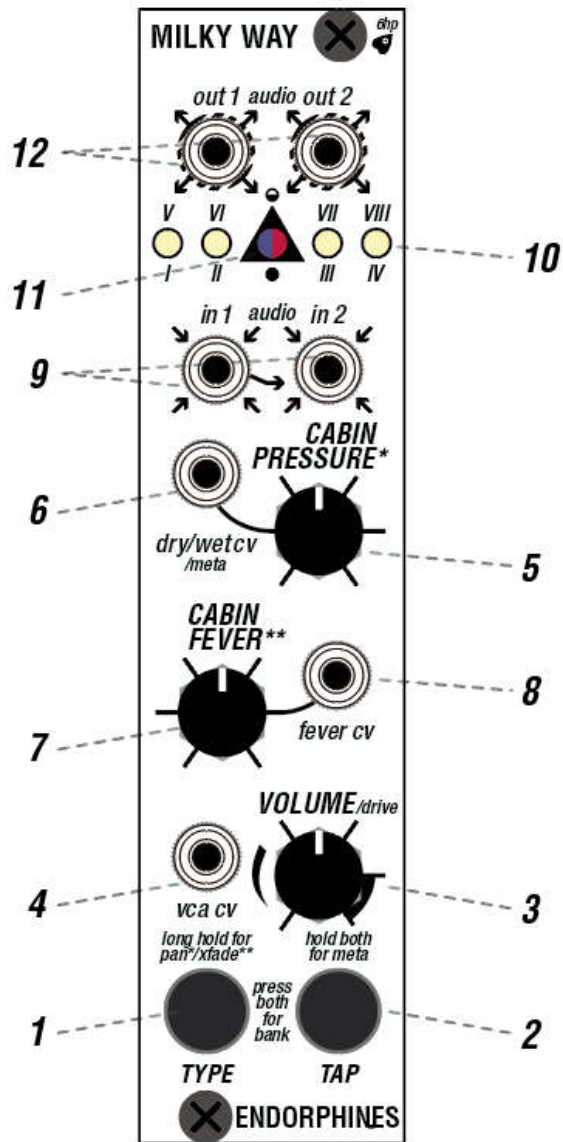
Connect the module directly to the power bus-board with supplied 10-16 ribbon cable like any other eurorack module. Pair of **RED/BROWN** pins on the multicolor ribbon cable corresponds to **NEGATIVE -12 VOLTS**.

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

- Width: 6 HP/TE for 3U version, 22 HP for 1U Intellijel format version
- Depth: 26 cm / 1" for 3U version, 42 cm / 1.65" for 1U version with inserted ribbon cable (fits all Intellijel Palette cases)
- Current draw: +12V: 120 mA, -12V: 15 mA
- CV range: 0...+5V

INTERFACE



1. **TYPE BUTTON:** pressing the TYPE button shortly cycles thru all the effect types. Short press TYPE+TAP changes the active bank of effects.
2. **TAP BUTTON:** holding TAP button for longer than 1 sec. enters the secondary effect setting (depending on the effect type). Pressing **TAP + TYPE** for longer than 1 second enables FX meta scanning 0...+5V or 0...+5V logical input with 0.65V threshold. Typical delay's clock expected 16th notes (PPQN24÷6).
3. **VOLUME KNOB:** final manual volume control with extra saturation after 15:00
4. **VCA CV INPUT:** unattenuated CV input for volume control with range 0...+5V.
5. **CABIN PRESSURE (DRY/WET) KNOB:** manual control and CV adjusts the dry (fully CCW) and wet (fully CW) level of the effect. Manual **CABIN PRESSURE** and **FEVER** knobs act as attenuators when the patch cable plugs are inserted.
6. **CABIN PRESSURE CV INPUT:** 0.....+5V cv input for the Dry/Wet control of the fx, attenuated by the Cabin Pressure knob.
7. **CABIN FEVER KNOB:** manual control and CV adjusts secondary effect parameter: decay of the reverb, feedback of the delay, etc.
8. **CABIN FEVER CV:** 0.....+5V cv input for the secondary parameter of the fx, attenuated by the Cabin Fever knob
9. **IN 1, IN 2 JACKS:** stereo audio inputs, *INPUT 1* (typically left) – is *normalised*, i.e. pre-routed → to *INPUT 2* (right) when no audio cable is present on *INPUT 2*. Typical input audio level: eurorack modular +/-5V with maximum up to +/-6.5V when saturation starts with higher audio amplitude. The 3U version has 2x gain input trimmers on the back that boost the input signal approximately x10 times which can be useful when using line level signals. By default, these trimmers are turned all the way down.
10. **FOUR WHITE LEDS** show the currently chosen fx algorithm. When the LED is fully LIT, then it shows one of I...IV chosen effect types. When the LED is semi LIT - it shows one of V...IV chosen effect types.
11. **RED/BLUE STATUS LED** shows bank change, update, entering secondary parameters, etc.
12. **OUT 1, OUT 2 JACKS:** final stereo audio outputs. *OUTPUT 1* is typically left and *OUTPUT 2* is typically right. *OUTPUTS 1/2* can drive headphones or be used as separate mono L/R outputs connected with mono cables. Both audio inputs and outputs support airline audio jack adapter (sold separately) to connect with a single 3,5mm TRS stereo (AUX) cable directly. Additionally in 1U version when each *OUT1/2* jack is used with stereo TRS cables, these outputs can be used in *PSEUDO-BALANCED CONNECTION* for example to your audio interface directly. Pseudo-balanced connection ensures less noise hum on the long cables but cuts the audio signal amplitude by half – to approximate *pro-line* level +/-2.5V.

FX TYPES

MILKY WAY features 16 FX types allocated to 2 banks of 8 fx each. Press the Type button to scroll through the FX in a bank. Short press Type + Tap to switch the bank. **AIRWAYS** Bank #1 is shown by the **Blue** LED and **DARKWAVES** Bank #2 is shown by the **Red** LED.

The first effect bank **AIRWAYS** contains effects tailored for tonal content.

It recreates different ambient spaces. The effects are approximately arranged by size – going from bigger spaces (like halls) to smaller ones finishing with delays and chorus.

The second bank **DARKWAVES** contains effects suitable for percussive sounds and serves a variety of different flavors.

AIRWAYS BANK

- I. **HALL REVERB:** *CABIN FEVER* knob defines the decay of the reverb or hall size. Holding *TAP* for longer than 1 second enables the secondary function for *CABIN FEVER*: fixed hi-pass filter to cut off low frequencies and have more 'air' in the final output.
- II. **SHIMMER REVERB:** is a variation of the hall reverb with a pitch shifter to create choir-like, huge unrealistic spaces. The primary *CABIN FEVER* function defines the decay and the secondary function defines the amount of pitch-shifter mixed into the original reverb.
- III. **STEREO ROOM REVERB:** recreates a stereo room ambience. Primary *CABIN FEVER* parameter defines room size and the secondary defines the stereo spread of the reverb, from mono up to a huge stereo spread.
- IV. **PLATE REVERB:** The primary *CABIN FEVER* defines the decay of the reverb. In real life equivalent, this is the distance from the pickups to the metal plate, which is how long the tail of the reverb is present. Secondary parameter defines the amount of pre-delay to distant sounds in ambience.
- V. **SPRING REVERB:** The primary *CABIN FEVER* defines the decay of the reverb. With the *TAP* button you can simulate a sound as if you pluck the real spring with your finger. The secondary function is tied to the *TAP* button's 'pluck the spring' feature and defines the decay of how fast the spring will calm down after manually plucking it.
- VI. **PING-PONG DELAY:** is a stereo-clocked delay. A *tap* is usually three or more short clicks on the *TAP* button. The primary *CABIN FEVER* parameter defines the feedback of the delay or repeats. The secondary defines the clock division of the incoming tap/clock: 1, 3/4, 2/3, 1/2, 1/3, 1/4, 1/8 spread around the whole knob range.
- VII. **TAPE ECHO:** is a delay with 3 fixed playback heads. Primary *CABIN FEVER* parameter defines the delay repeat rate, which is the speed of tape. The *TAP* button works in a limited frequency range of manual tapping and defines the amount of feedback. The secondary works as a divider for the incoming clock.

- VIII. **CHORUS:** Primary *CABIN FEVER* knob defines the feedback amount. In average amounts, it creates a typical unison effect, however, in full CW it goes to an infinite feedback resulting in a surrealistic ambient. Secondary parameter defines the modulation depth, which is 'full on' by default.

DARKWAVES BANK

- I. **GATED REVERB:** based around plate reverb with noise gate. The primary *CABIN FEVER* defines the reverb decay, but the secondary defines the threshold of the noise gate. Noise gate's attack and decay are fixed and chosen experimentally to fit most musical styles.
- II. **SPRING REVERB:** The primary *CABIN FEVER* defines the decay of the reverb. With the *TAP* button you can simulate a sound as if you pluck the real spring with your finger. The secondary function is tied to the *TAP* button's 'pluck the spring' feature and defines the DECAY of how fast the spring will calm down after manually plucking it.
- III. **REVERSED REVERB:** takes the reverb tail of the sound and reverses it. If applied on drums like snare then it creates a breathing effect. *CABIN PRESSURE* knob defines the pre-delay time and acts as dry/wet control. *CABIN FEVER* sets the reverb decay value. Holding *TAP* for longer than 1 second enables the secondary function for *CABIN FEVER*: damping, i.e. volume of the tail (in our case tail = 'head' as the tail is reversed).
- IV. **FLANGER:** The *CABIN PRESSURE* knob sets the amount of delay. With primary *CABIN FEVER* we set the LFO speed. The secondary defines the feedback. Playing with those three parameters allows one to achieve sweeping, airplane engine-like sound with a pretty wide range.
- V. **RING MODULATOR:** multiplies the signal with an internal sine wave oscillator. *CABIN PRESSURE* defines the amount of modulation and *CABIN FEVER* defines the speed of the oscillator. Secret ingredient – feedback! Its amount is controlled by the secondary *CABIN FEVER* and brings special dirtiness to the sounds.
- VI. **OVERDRIVE:** *CABIN PRESSURE* knob adjusts the drive amount with volume compensation, while *CABIN FEVER* defines the tone control as usually found in guitar pedals. The *TAP* button makes the effect active or bypassed, like the switch on a guitar pedal – and so does *CABIN FEVER* latching trigger CV input.
- VII. **PEAK COMPRESSOR:** *CABIN PRESSURE* knob defines the threshold from -90dB to 0dB (fully CW). Primary *CABIN FEVER* sets the amount of gain reduction (ratio) from 1 to 25. Secondary parameter defines the attack, from 1 to 200 msec. Release is always 'auto'. *CABIN FEVER* CV input is an unattenuated side-chain input.
- VIII. **FREEZER / LOOPER:** When *TAP* is pressed or *CABIN FEVER* CV gate is ON, the audio is looped by the grain length defined by the *CABIN FEVER* knob – and with the speed – defined by *CABIN PRESSURE* knob or CV – applied.

SPECIAL OPERATION MODES

Apart from being a very flexible FX processor, Milky Way also has a couple of tricks up its sleeve. The 3 special modes are Meta FX, Spatial Movement and Saturation Overkill.

META FX

This mode allows you to scan through the FX with an external CV, which can open up the whole world of sound design possibilities. To enter this mode hold press *TYPE* + *TAP* for 1 second. *CABIN PRESSURE* and *CABIN FEVER* knobs still control the FX parameters, but now the CV input for Cabin Pressure will be your FX scan input, which accepts voltages in the range of -5V...+5V.

→ 0...+5V external CV will scan through the current bank of FX.

→ -5V...0 external CV will scan through the unselected bank of FX.

Every time you switch the FX algorithm, the FX parameters will be stored, this way you can fine-tune the sweet spots for each algorithm and Meta Sequence the algorithms with higher precision and musicality.

SPATIAL FX

Pressing the *TYPE* button for longer than 1 second will enable *PANNING/XFADE* mode and the LED inside the triangle will light up *fuchsia*.

→ Brightness of LEDs 1 and 2 indicates the output level of *IN1* and *IN2* at the *OUT 1*.

→ Brightness of LEDs 3 and 4 indicates the output level of *IN1* and *IN2* at the *OUT 2*.

CABIN FEVER control with CV will adjust crossfade (blending) between 'in1' and 'in2' as they appear in separate 'out1' and 'out2' (full CCW) or in both outputs (noon) or in reversed outputs (full CW). By default, the position of the *CABIN FEVER* knob is set to fully CCW.

CABIN PRESSURE control with CV will adjust final panning of both 'in1' and 'in2' to the 'out1' and 'out2' after the blending stage. By default the *CABIN PRESSURE* knob is set at 12:00.

SATURATION OVERKILL

Once the *VOLUME KNOB* crosses 3 o'clock position and further, the status LED blinks RED and the overall signal starts to saturate. *VCA CV* input works in the range from 0V (full silence) to 5V (max. volume limit set by the knob (incl. saturation)). Saturation adds warmth

(and noise!) to the sound and compress the dynamic range, which can be especially useful for percussion.

FIRMWARE UPDATE

1. Download the latest firmware from:
<https://www.endorphin.es/modules/p/milky-way>
 2. The update procedure is done via audio: either computer or phone will work, we advise you to disable all the notifications (flight mode) so that the update is not interrupted.
 3. Power *OFF* you modular system
 4. Hold *TAP* while powering your system again, you will see the status LED blink blue
 5. Connect the audio output from your computer headphones output or phone to one of the audio inputs on the module with simple mono or stereo cable.
 6. Press *PLAY* and wait 2+ minutes. Use an audio file player that does not apply audio compression to the file. During the update process you should observe that the **BLUE** light is blinking faster than usual. The module will reboot automatically after the new firmware has been installed.
 7. Make sure you don't input any extra sounds during the update process (reminder signals from your calendar, etc.). When the status LED flashes **RED** – that means the signal is too low or too high – just reset the firmware acquire process by pressing *TAP* once. This can also happen when you first insert the cable into the audio input.
- **IMPORTANT:** To prevent the errors during the audio playback of the firmware, please use any audio editor without any effects applied (EQ etc).

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; EN55103-2:2009 (EN55024); EN61000-3-2; EN61000-3-3

Low Voltage: 2014/35/EU

EN 60065:2002+A1:2006+A11:2008+A2:2010+A12:2011

RoHS2: 2011/65/EU

WEEE: 2012/19/EU