



# BURST

## USER MANUAL

## POWERING THE MODULE | THANKS FOR PURCHASING A MODULE FROM BEFACO! MODULE BEFORE YOU PLUG THIS MODULE IN...

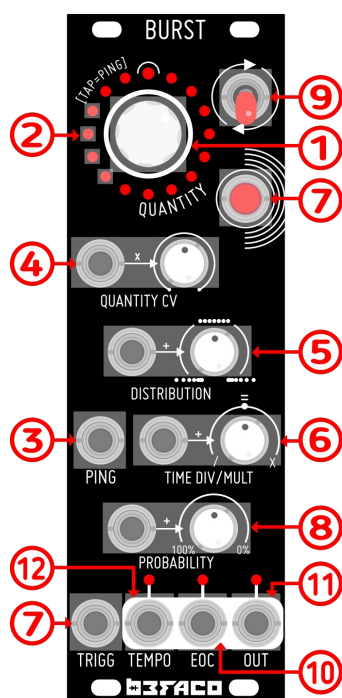
1. **Disconnect your cabinet from the mains.**
2. **Triple check the power cord polarity.** The coloured line on the cable (pin number one) is the -12V rail.
3. If you plug the module backwards you might burn it out and unfortunately this is not covered by the warranty.
4. If you have any questions about this product please send them to: [befacosynth@gmail.com](mailto:befacosynth@gmail.com)



## INTRODUCTION | DESCRIPTION

Burst, is a trigger processor and generator, designed to add organic chain of events to your modular setup. You can see it like **"Trigger Activated Trigger Burst"**. Each time it is activated, either manually or with an external trigger, a given amount of triggers are generated. You can control Time Division, Distribution, Quantity and Probability of the bursts.

## MODULE REFERENCE | PANEL OVERVIEW



1. Quantity Encoder  
Manual control of trigger amount and Tap Tempo
2. Led Round Display  
Visual feedback of Trigger Quantity, Burst and Pots settings.
3. Ping Input  
Sets the size of the time window via trigger/clock.
4. Quantity Knob // CV IN  
CV input with attenuator for Quantity.
5. Distribution Knob // CV IN  
Control how the triggers are distributed inside the Burst.
6. Time Div/Mult // CV IN  
Divide or multiply the time window.
7. Manual Trigger // Trigg IN  
Initialize the Burst manually or via Gate/Trigger respectively.
8. Probability Knob // CV IN  
Add unpredictability to the "Trigger Train" manually or by voltage respectively.
9. Cycle Switch  
Puts "Burst" in loop.
10. EOC (End of Cycle Output)  
Outputs a trigger each time burst finish
11. Output  
Main trigger Burst Out.
12. Tempo Out  
A clock at the internal tempo

FUNCTIONAL MODES

HOW IT WORKS?



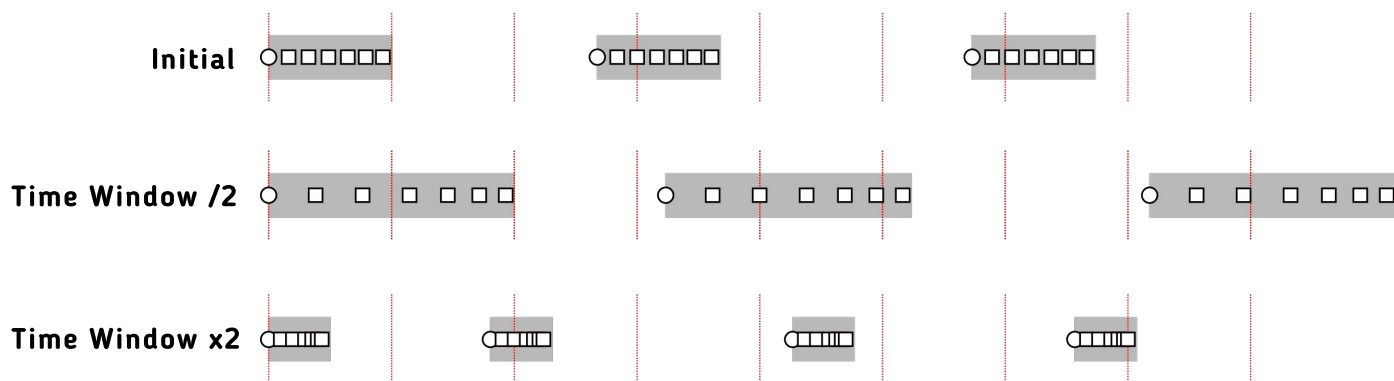
Burst will convert a trigger present in its input into a burst of triggers. Fitting in the time given by a ping input and distributed according to the different parameters.

PINGING THE UNIT

To keep things on time, Burst always works inside a **Time Window**: a time frame where the burst generated will fit. It is similar to the concept of tempo but not necessary repeating all the time. This concept might seem confusing, but you will get it easily!

As you can see on the schem below, the time window size is defined by the clock (tapping the encoder or sending pulses to **Ping IN**) but not necessary follows it. Burst is not clockable but "**Pingable**" (thanks 4ms for the term). In both cases, frequency is set by time between pulses but pingable devices don't need this pulses running all the time.

You can trig the burst at any time and will keep its size, so you can fit it quite easily to your musical tempo.

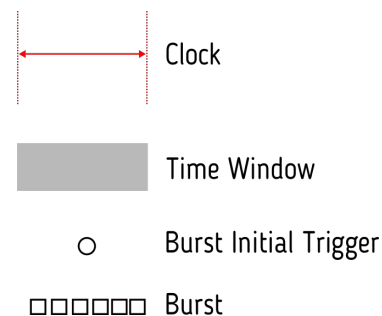


With Burst synced to your tempo you can create all kind of ratcheting effects and multiplications leading to doubles, triplets, quintuplets and true Poly Rythms for your modular system.

With very short time windows, Burst can help to synthesize fast repeating transients for "hand clap like" sounds or mordent drum hits.

Burst normal mode is one shot but it can also work in repeating mode converting it in a handy clock divider or multiplier.

Working in Cycle Mode, is also an excellent master clock with tap tempo functionality, and is able to achieve non linear distributed clocks.



## FUNCTIONAL MODES | CONTROLS

### QUANTITY ENCODER

The main control of Burst is the **Quantity Encoder**. It has two main functions.

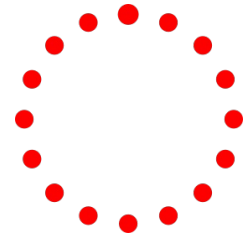


- 1. Control the amount of triggers that are included on the burst.** The amount of triggers can be changed in any moment but the changes will only be effective when a new burst starts. This setting is stored in non-volatile memory, so it remains even if the device is turned off. The maximum amount of triggers is 32.
- 2. Manual "Ping"/Tap Tempo.** Tapping it two times or more, you can manually adjust the time window where the burst will take place. If you tap it more than twice, the time between them will be averaged to improve timing precision. This adjustment is also stored in non-volatile memory.

### LED ROUND DISPLAY

It gives you the next information:

- 1. Trigger Quantity.** Always one LED keeps lit to show the number of triggers inside the burst.
- 2. Burst.** When a burst is started you can visualize it. Each LED represents a trigger on the burst and they blink in order to show you the current state.
- 3. Knobs/CV Settings:** When there is a change at manual controls or CV INs the display will show these changes.



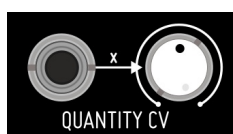
When various parameters are working at the same time, the visualization of the Burst always prevails.

### PING IN

Sets the size of the time window via trigger/clock. It has the same effect as tapping the encoder. Once the time window is set, it remains set even if the clock stops. This setting is not saved in non-volatile memory.

### QUANTITY CV/ATTENUATOR

With them you can control the amount of triggers via CV. Quantity CV value is added or subtracted to the quantity encoder's current value. The quantity pot attenuates the CV input so you can adapt incoming CVs to your needs. This input is bipolar and accepts voltages from -5V to 10V in the following manner:



**-5V:** Subtracts 16 triggers

**0V:** Quantity remains as set by the encoder.

**5V:** Adds 16 triggers.

**10V:** Adds 32 triggers.

Voltages over 10V or under -5V are just ignored.

FUNCTIONAL MODES | CONTROLS



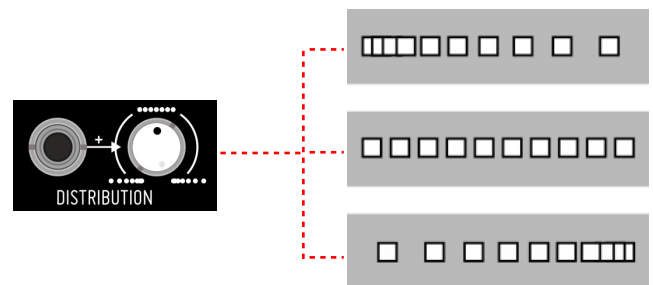
DISTRIBUTION KNOB/CV IN

Controls how the triggers are distributed inside the burst. Distribution can be linear, logarithmic or exponential, and can be controlled either manually or by voltage respectively. That means, distance between triggers can be constant, or can change during the burst (increase or decrease).

This parameter is useful for add "physics" feeling to your trigger train, and make it more dynamic and organic.

10v CV are accepted at the CV IN, and this value is added to the pot value, allowing negative voltages in the same amount the pot is positive.

With the pot anticlockwise CV can go from 0 to 10V, with the pot at the middle CVs go from -5v to 5v. With the pot clockwise -10v to 0v will be accepted. Other voltages are just ignored and don't represent any danger for the module.

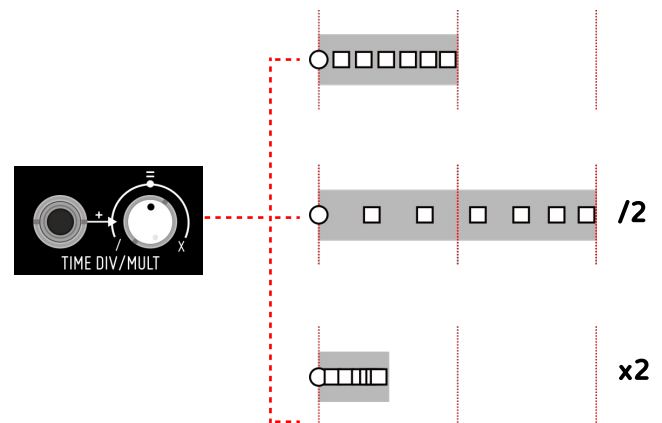


TIME DIVISION/MULTIPLICATION KNOB/CV IN

Sets This IN and its associate Manual control knob, divide or multiply the time window by an entire number.

Knob and CV values are added together.

With the knob at center, and 0v at the CV IN it doesn't have any effect. Clockwise is multiplied by a maximum of eight, and counterclockwise is divided by the same amount.



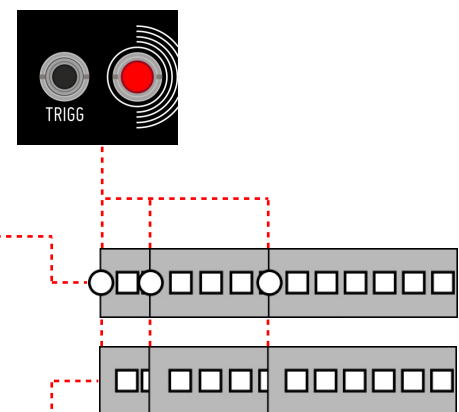
MANUAL TRIGGER/TRIGGER IN

Sets Both initialize the burst, manually or via trigger/gate respectively.

They work in "re-trigger" way so they always initialize the burst from the beginning. Trigg IN is dependent of the probability adjustment but manual trigger isn't.

By default, the incoming trigger (either manual or via Trigg IN) is always present on the out and is not affected by Probability CV/Knob (the minimum trigger on the out is always one).

But If you need the opposite behaviour, just push the trigger button and hold it during three seconds. This setting delete the initial trigger of the out and sets to 0 the minimum number of triggers on the burst. Same operation will be used to get back to the default state.



## FUNCTIONAL MODES | CONTROLS

### PROBABILITY KNOB/CV IN

With the Probability Knob/CV you can add unpredictability to the "trigger train", manually or by voltage respectively.

It controls how often the burst is randomly inhibited.

With 0v at the CV IN or the pot counterclockwise it remains untouched. With 10v or the pot clockwise it never happen, and because of this, you can also use this parameter as an "Inhibit" control.

Like on most INs, 10v CV are accepted, and this value is added to the pot value, allowing negative voltages in the same amount the pot is positive.

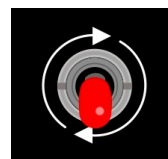
With the pot anticlockwise CV can go from 0 to 10V, with the pot at the middle CVs go from -5v to 5v. With the pot clockwise -10v to 0v will be accepted. Other voltages are just ignored and don't represent any danger for the module.

### CYCLE SWITCH

Cycle switch puts Burst in loop mode so it repeats again and again after a trigger is received. It have two positions:

In Cycle mode the triggers still affected by Probability settings.

If a trigger is present the burst will be reset from this point.



**UP:** Cycle ON, latch

**DOWN:** Cycle OFF

### EOC OUT

A trigger each time burst finish. This is known as EOC (End of Cycle). Useful to chain any order device so it triggers after burst finish.

### TEMPO OUT

A clock at the internal tempo. Useful if you want to use Burst as main clock of your system.

## MISCELLANEA | SPECS & CREDITS

\* **Size:** 8HP

\* **Depth:** 30mm

\* **+12v:** 50mA

\* **-12v:** 10mA

\* **Design:** Diego Rodríguez

\* **Firmware Coding:** Jeremy Bernstein & Eloi Flores

\* **Special thanks to** Jonatan Bernabeu, Pepe Coca, Edu Tarradas "Clip", Pau Cabruja, Miguel Eedl and all Befaco Team for their unpayable help during the module development.