

Multi Divider

Version e, build #6, 2023-04-26



Multi Divider contains six equal channels that can be used to divide input frequency or to create trigger signals, when a distinct number of pulses is count. These counters may operate simultaneously or cascaded.

1. Function

Normally all divider channels get a common signal from **trig in**. An input gate for this signal can be closed with **pause in** and opened with **run in**.

With **LINK** toggle button next counter will be disconnected from common input and connected to previous counter output.

Each channel contains a four digit counter. After reset it counts upwards at each off-on change at **trig in** jack (on: > 2.5 V). When preset value is reached, a pulse at **trig out** jack is provided. Duration of these pulses is selectable from 1 to 50 Samples. (In *Voltage Modular* one sample interval is 1/48000 second at default sample rate.)

When **REPEAT** is activated, counter works in circle mode and starts counting from zero again. Otherwise counter stops. So in normal mode (no LINK active, no REPEAT active) **Multi Divider** can be used to control six different events, that shall happen up to 9,999 input pulses from run start.

2. Controls and Connectors



With this push button you can create a trig pulse.

LED flashes at every OFF-ON change.

Any OFF-ON change of control voltage triggers counters.
(OFF: ≤ 2.5 V, ON: > 2.5 V)



Pushing this button opens input gate for trigger pulses.

Same does a CV with an OFF-ON change.

Please note: For **RUN** and **PAUSE** both inputs and buttons are operating alternatively (as “radio buttons”). If CV get active at **run in** and **pause in** at same time, counting will pause.



Pushed button stops counting without affecting actual counter values, because input gate gets closed.

A CV Stops counting with OFF-ON change.



Reset button sets counter values to zero. After reset normal operation will be continued if device is not set to PAUSE.

A CV OFF-ON change resets all counters to zero. If voltage stays further ON, it has no effect.



LED flashes at OFF-ON change.

Outputs a 5 v trigger pulse, when counter value reaches preset value.



You can change preset values by clicking up/down buttons.



When **KNOBS** toggle button is ON, knobs are displayed instead of up/down buttons. With right mouse click on a knob, you can chose "Edit Value". This lets you input large preset values very quick.



since build #6:



Beside preset buttons **KNOBS** also lets appear this **trig len** knob at upper right module corner. It serves to set the length of output trigger pulses. You can select one of six fixed values:

1 sample	0.02 milliseconds
2 samples	0.04 milliseconds
5 samples	0.10 milliseconds
10 samples	0.21 milliseconds
25 samples	0.52 milliseconds
50 samples	1.04 milliseconds (default)

Former **Multi Divider** versions provided output trigger pulses with a fixed duration of one millisecond. To guarantee a back compability, version #6 defines "50 samples" as default, though "trigger" is usually meant to be much shorter.



Activate this button, when you want to use a counter as frequency divider. (endless circle run mode)

Deactivate this button, when the counter should work as timer. (counter works only once)



When **LINK** button is on, the output of previous counter will trig next channel's counter. This function is only useful, when **REPEAT** is ON for preceding channel.

3. Example setups

3.1 Frequency divider

Input frequency should be divided by 3, 4, 8, 12, 64.

- Adjust counter preset by up / down buttons, holding these buttons will repeat increment / decrement steps automatically.
- Reset counters.
- Open gate with an ON signal at [run in] or by pressing run button.
- Set preset counters

a) Multi Divider channels are working in parallel mode:

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
preset	3	4	8	12	64
REPEAT	on	on	on	on	on
LINK to next	off	off	off	off	(on/off)
output	f/3	f/4	f/8	f/12	f/64

b) Multi Divider channels are working in parallel/cascaded mode:

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
preset	3	4	4	2	8
REPEAT	on	on	on	on	on
LINK to next	on	off	on	on	(on/off)
output	f/3	f/12	f/4	f/8	f/64



a) parallel mode



b) parallel/serial mode

3.2 Frequency divider and event control

Events should be triggered after each 32 pulses, once after 64, 98 and 128 pulses. In this example stage 2 is triggered by stage 1 in order to show mixed use of [REPEAT] mode on and off.

- Adjust counter preset by up / down buttons, holding these buttons will repeat increment / decrement steps automatically.
- Reset counters.
- Open gate with an ON signal at [run in] or by pressing run button.

c) Multi Divider channels are working in parallel mode:

	Stage 1	Stage 2	Stage 3	Stage 4
preset	32	2	98	128
[REPEAT]	on	off	off	off
[LINK] next	on	off	off	(on/off)
output	f/32	after 64	after 98	after 128



c) Frequency divider and event counter