



Detectorist Gate/Trigger Generator - Eurorack
Copyright 2023 SetonixSynth. All rights reserved.

Hello and thank you for using the Detectorist Gate/Trigger Generator for Eurorack. We hope you will find its gates and triggers most pleasing!

The Detectorist is a 2hp Gate-to-Trigger-to-Gate module, designed to provide useful “duty cycle”-like behavior from any sharp rising edge input.

When triggered by either the Gate Input jack or Manual pushbutton, the Detectorist will produce an adjustable-length Pulse, spanning in length from 12 milliseconds - about 85 seconds over its three ranges. If the Detectorist is re-triggered while the Output is already active, the count will reset but the Output will remain active without dropping to zero, thus “tying” the pulses, or producing 100% duty cycle.

This circuit is heavily indebted to the great Forrest M. Mimms III and his *Missing Pulse Detector* circuit, which can be found in his [555 Timer IC Circuits](#) Engineer’s Mini-Notebook.

Technical Specifications (Eurorack standard)

Width: 2hp

Depth: 35mm

Peak Current Draw: 15mA @ +12V, 0mA @ -12V

Gate Input Impedance: 100k Ω (Negative voltage protected)

Gate Input Threshold: 2.5V

Output Impedance: 1k Ω

Output Voltage: 5.2V with standard 100k Ω load

Ranges (approximate):

-Short: 12ms - 1 second

-Medium: 100ms - 6.5 seconds

-Long: 1 second - 85 seconds

1. Installing your Detectorist

Use a 10-to-16 pin Eurorack power ribbon cable to attach power from your case to the back of the Detectorist. Since the Detectorist power header only has 5 pins, make sure the ribbon cable’s header is utilizing the correct row so that it sits squarely behind the front panel and doesn’t interfere with other modules.

2. Theory of Operation

The Detectorist fills a fairly straightforward but necessary function in an elegant way. Many musical events depend on, or at least benefit greatly from, the ability to manually adjust the event or note length. We wanted to design a simple, full featured and musical module for doing just this from a wide range of input sources.

In order to achieve the widest range of functionality, the Detectorist has slightly different behaviors depending on whether the Gate Input or Manual pushbutton is used. Any fast rising

edge sent to the Gate Input jack is immediately converted to a short trigger signal before it is combined with the signal from the Manual pushbutton and sent to the main timer circuit of the Detectorist. Since the Detectorist only sees a trigger from the input jack, it can be used to create Triggers from Gates at its shortest settings, as well as Gates from Triggers at longer settings.

The Manual pushbutton, however, does not have an onboard trigger converter, so pushing the Manual pushbutton will produce a High output voltage as long as the pushbutton is held down or the Detectorist circuit is producing a timed gate, whichever is longer.

Once the Detectorist circuit receives a rising edge from either the Gate Input jack or Manual pushbutton, its count will initiate, with the length of the gate determined by the setting of the three-position Range switch and Length potentiometer. If another input pulse is received while the Output is active, the count will reset but the Output will remain high continuously.

3. Summary of Functions

Range: Sets the control range of the Length potentiometer, with three settings to allow for a wide range of control. See the Technical Specification section for use info for each range.

Length: Sets the length of the Detectorist's timing sequence, with settings further Clockwise corresponding to longer length. The range of the potentiometer is controlled by the Range switch.

Manual: Pushbutton to start the timing sequence of Detectorist. The Manual switch's signal is not converted to a trigger, so it will cause an Output High signal as long as it is depressed. At short Length settings, this can be useful to just create a high-quality, expressive variable length Gate output.

Gate Input: Main input for starting the Detectorist's timing sequence. Any sharp rising edge input (Gate, Trigger, some LFO waveforms such as Saw and Square wave) is immediately converted to a short pulse which initiates the Detectorist timing sequence.

Output: Logic output for controlling other modules. If the Detectorist timing sequence is active and/or the Manual pushbutton is held down, the Output and LED indicator will be active, outputting a Logic High signal of approximately 5V. At all other times the Output is Logic Low with a voltage of 0V.

No calibration is required for the Detectorist. Enjoy your module!