

# Glitch Amplifier

## Quick Start Guide





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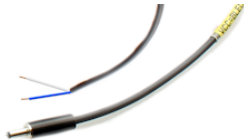
## What is in the box

The box contains the Glitch Amplifier and all accessories to connect it to an embedded target and a glitch generator.



### Box content checklist

Qty [1]	Description	Photo	Identifier [2]
1	Glitch Amplifier		GA
1	Power supply. Input 100 V .. 240 V AC, 50 .. 60 Hz.  Including a power cable (country specific)		PSU

Qty [1]	Description	Photo	Identifier [2]
1	Signal cable: - BNC-SMB, coax, 50 $\Omega$ , 3 ft.		BNC2SMB
1	Signal cable: - SMB-SMB, coax, 50 $\Omega$ , 3 ft.		SMB2SMB
1	Target supply cable: - male jack to 2 wires: blue (VCC) + white (GND)		
	This "Glitch Amplifier- Quick Start Guide"		

<sup>[1]</sup> Qty = Quantity, the number of units delivered.

<sup>[2]</sup> The identifier is used for reference in this document only.

## Manufactured by

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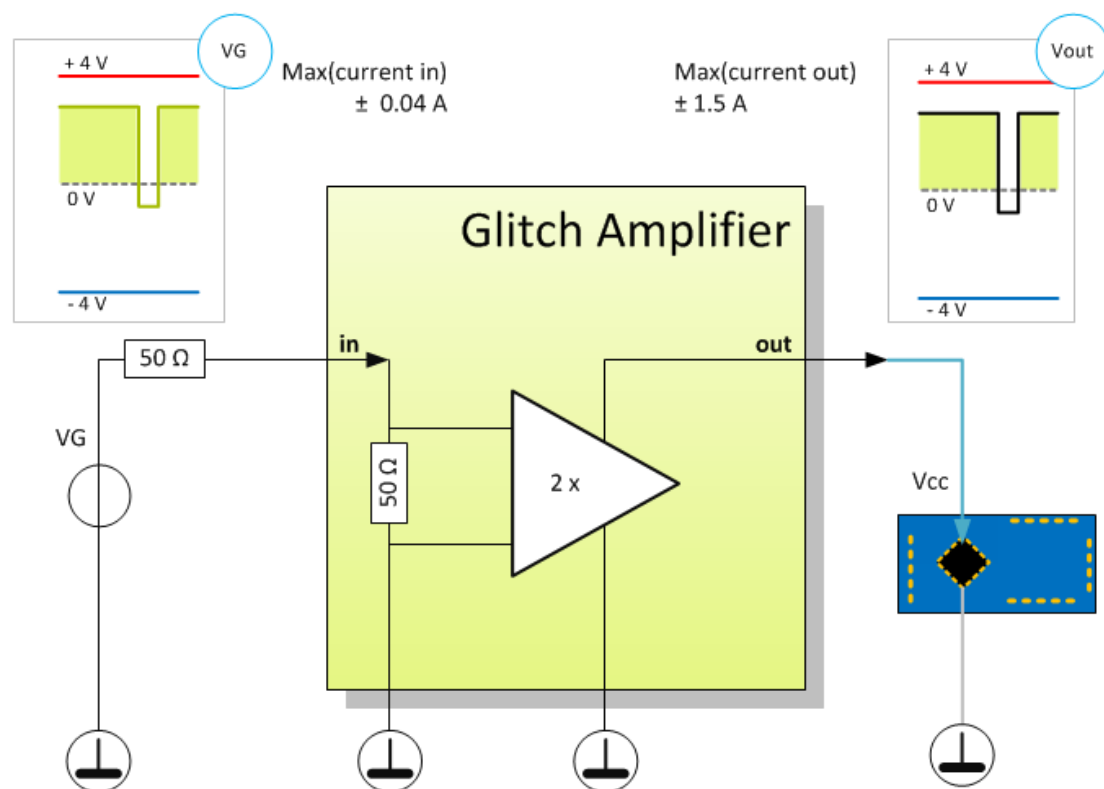
Web: [www.riscure.com](http://www.riscure.com)

## What does it do

The Glitch Amplifier is device to power embedded targets, for example FPGA's or SOC's.

The Glitch Amplifier is capable of inserting high speed glitches in the supply voltage while handling the high supply currents.

The signal for glitching can be generated by a pulse generator like Riscure's VC Glitcher.



*Figure 1 Functional overview of the Glitch Amplifier.*

The Glitch Amplifier is a stand-alone device. It is typically used in combination with Inspector and VC Glitcher.

# How to build a setup

## Typical setup for static power glitching

Additional products used: VC Glitcher, Current Probe.

In this setup the Glitch Amplifier powers the target and transfers voltage glitches. The supply voltage level (vcc) and voltage glitches are generated by a VC Glitcher.

In the preparation phase, a Current Probe and an oscilloscope are used to explorer the best glitch timing parameters relative to a trigger from the target using a Simple Power Analysis (SPA).

In the execution phase, the Current Probe is usually removed from the setup to prevent any possible glitch shape deformation.

When executing a perturbation run, Inspector is commanding the VC Glitcher to perform randomized glitch levels, pulse lengths and cycle patterns. The target's responses are recorded by Inspector for further analysis.

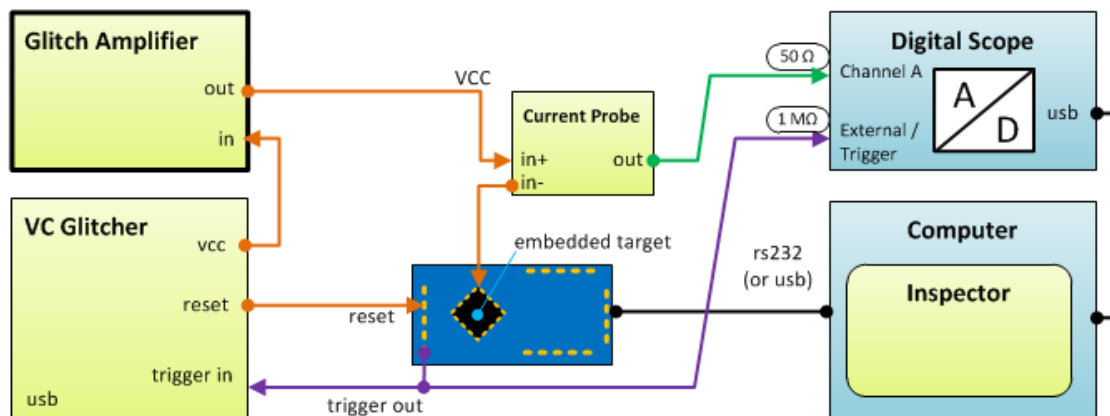


Figure 2 Perturbation of the power supply line with static timing

## Setup used for dynamic power glitching

Additional products used: VC Glitcher, icWaves, EM Probe

This setup has a target with variable clock frequency countermeasures to make synchronization difficult. The variability in timing is captured by triggering on a preselected wave fragment in the power consumption. Recognition of this fragment is performed by the icWaves using the signal from an EM Probe (or a Current Probe).

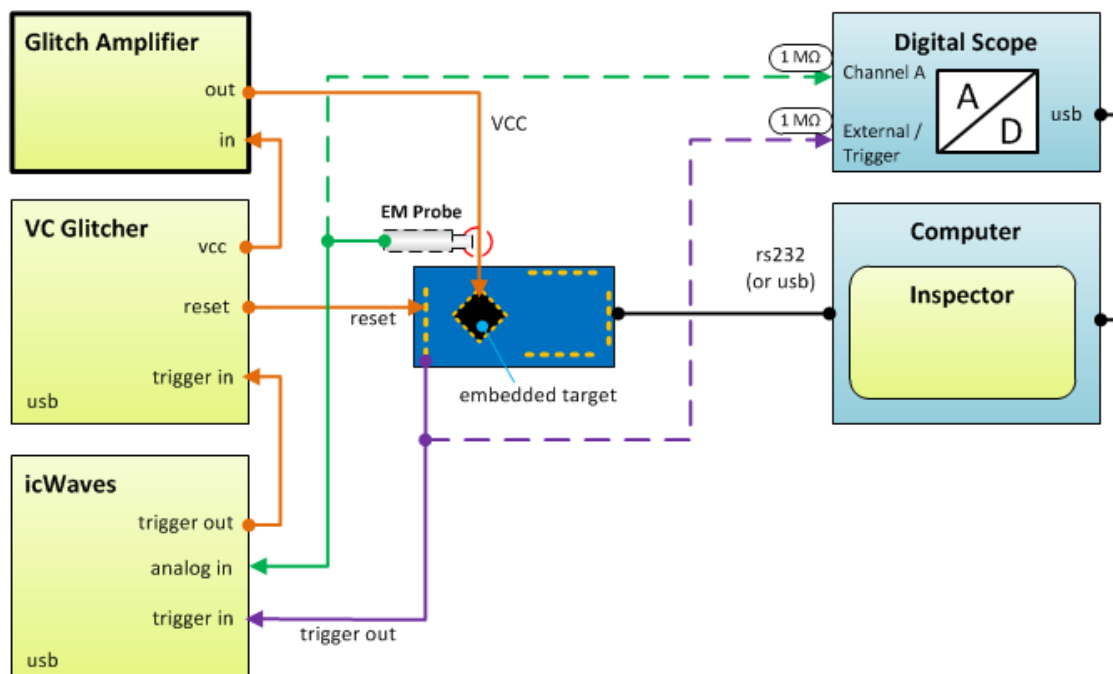


Figure 3 Perturbation of the power supply line with dynamic timing.



You may want to remove the power supply capacitors on the embedded target to get better power consumption readings and better glitch effects.



Keep the wiring between the Glitch Amplifier and the target as short as possible. Both wires should be close together or even better be twisted.

Short and twisted cables have a low inductance providing better power consumption readings and better glitch effects.



The analog input of icWaves 3 can be configured for input impedances 50  $\Omega$  / 1 M $\Omega$ , selectable by software. Configure it for 50  $\Omega$ .

# Help and troubleshooting

## Interoperability issues

No known issues.

## Still have questions?

Visit the Riscure Support Portal at <https://support.riscure.com>.



# Technical specifications

## Operational conditions

- Room temperature 20 - 30 °C (68 - 86 F).



Do not block the ventilation holes of the Glitch Amplifier.  
A blocked air flow may cause malfunction.

## Power supply input

- 15 V DC, nominal load 600 mA
- Center-positive plug, inner-Ø 2.5 mm, outer-Ø 5.5 mm.



Use of a PSU other than supplied by Riscure is not supported. Power spikes may cause internal damage and loss of accuracy.

## Input signal

- Input impedance 50  $\Omega$ , DC coupling
- Allowed value range -2 V .. +2 V.

## Output signal

- Output impedance < 0.5  $\Omega$ .
- Output voltage -4 V .. +4 V.
- Maximum output current: 1.0 A continuous, 1.5 A peak
- Overload protection

## Amplifier

- Amplifier gain: 2x
- Frequency range: DC – 1.5 GHz @ 3 dB

## Product case

- Dimensions L x W x H : 125 x 80 x 28 [mm], 4.92 x 3.14 x 1.10 [inch]



Port	Label	Description
A1	<b>on</b>	Green LED. ON = 15VDC present. OFF = no power.
A2	<b>out</b>	SMB, analog output, -4 V .. +4 V DC Glitched power supply VCC to target.
B1	<b>in</b>	SMB, analog input, -2 V .. +2 V DC Master signal for output port.
B2	<b>15VDC</b>	15 V DC. Power supply input.

