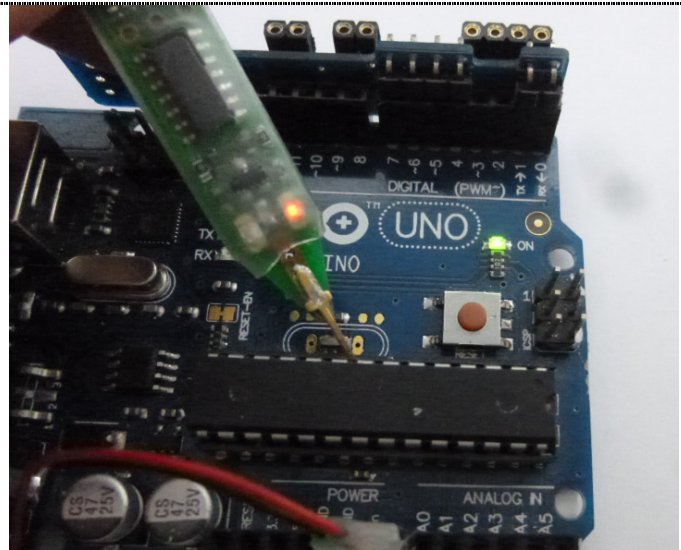


## Mini Logic Pen *LoPen* – handy and efficient

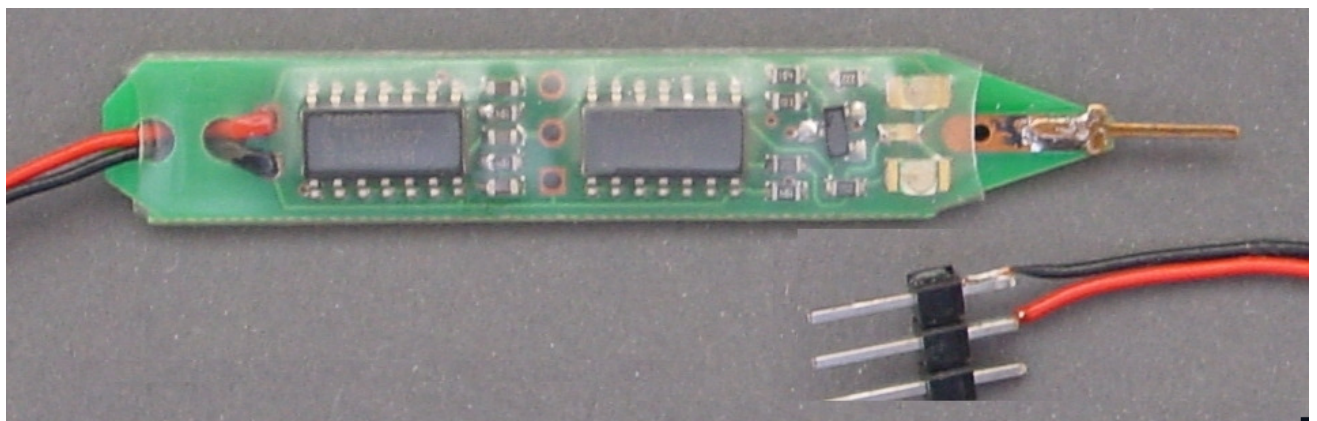
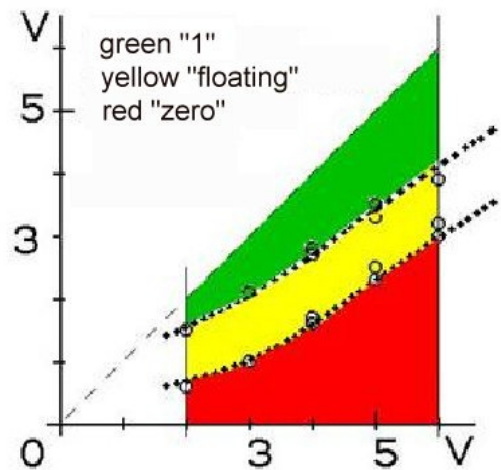
A logic probe or logic tester shows the state of a logic signal. If that state is zero or one, a simple LED can be used. A logic signal can also be floating, that is not connected or in three-state mode. It can also be a short pulse your LED will not see, or it is pulsing too fast for your eyes. LoPen takes care of these situations: A yellow LED shows floating signals. Visible blinks are given for glitches as short as 100 nanoseconds, A slow blink shows a high frequency signal.



### Logic levels and input impedance

Let's consider a 5V microcontroller design. Most signals are digital. Zeros with a voltage close to 0V (< 1V to be safe), ones with a voltage close to 5V (> 3V to be safe). Floating signals have any voltage. The tip of LoPen is floating when not touching a signal. This is detected with 100 KOhm resistances that assign the tip voltage to 2.5V.

For a "good zero", the red LED is on, for a "good one" the green LED is on. It does not correspond exactly to the circuit's specifications, anyway all slightly different, but it is sufficient for debugging. And it works from 2 to 6 Volts. The schematic includes one-shots and 100 nanosecond pulses are converted to 0.3s red or green blink. You even can get a good feeling of pwm percentage, but notice the red/green blinking frequency is not related to the PWM frequency.



## Power

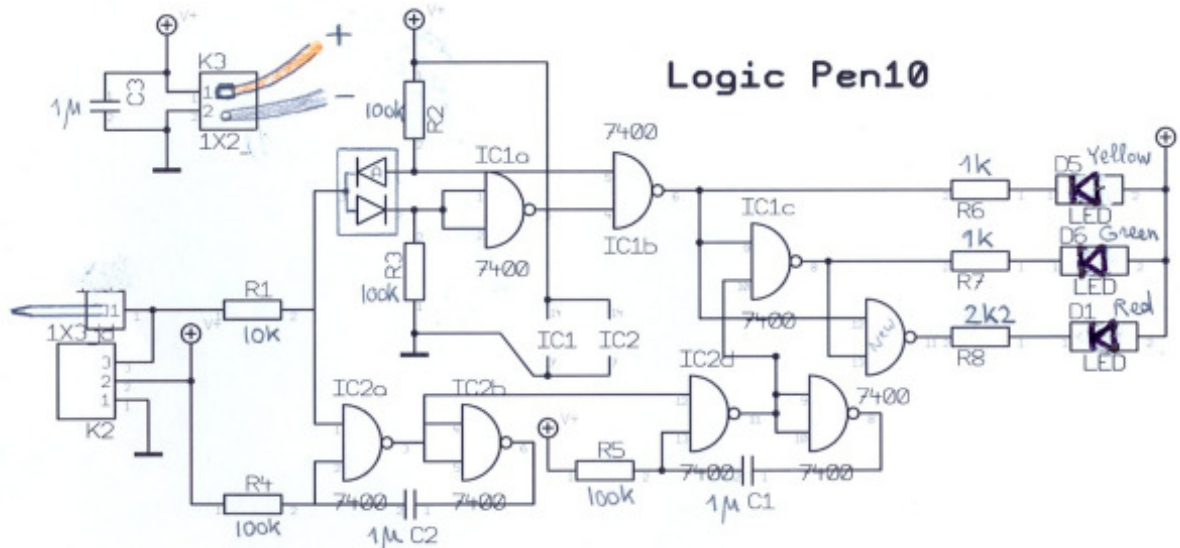
Power is 2 to 6V. Use a red wire for the positive supply and a black wire for the Gnd.

A diode protect the circuit in case of inverted polarity.

The connector is a 2-pin 2.54mm male strip that get power from 2 next-by power pins. Easy to change, but we recommend to make an adapter with a female plug.

You can also power the Logic pen from two signal pins, one with a logic zero for the Gnd and one with a logic 1; current is less than 5mA.

## Schematic



Documentation in french [www.didel.com/diduin/Testeur\\_Logique.pdf](http://www.didel.com/diduin/Testeur_Logique.pdf)

## Logic tester kit

Easy kit, same schematic, same features.

Also available on Tindie.

