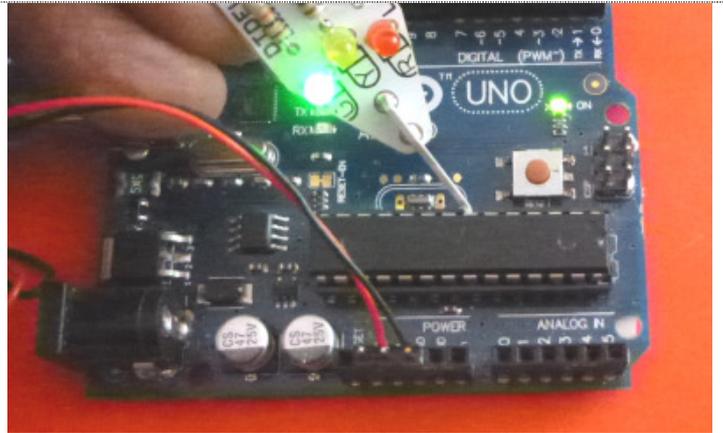


Logic tester *LoPen* – an easy and useful kit

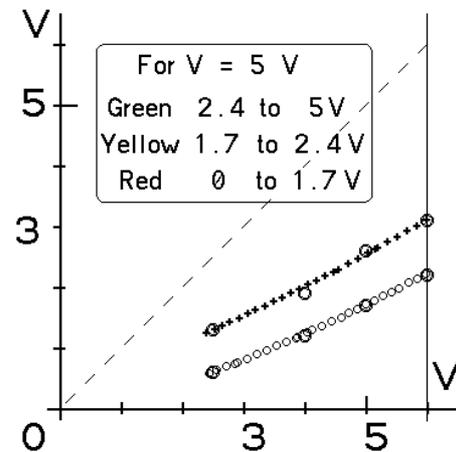
A logic probe or logic tester shows the state of a logic signal. If that state is zero or one, a simple LED can be used. A logic signal can also be floating, that is not connected or in three-state mode. It can also be a short pulse your LED will not see, or it is pulsing too fast for your eyes. LoPen 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

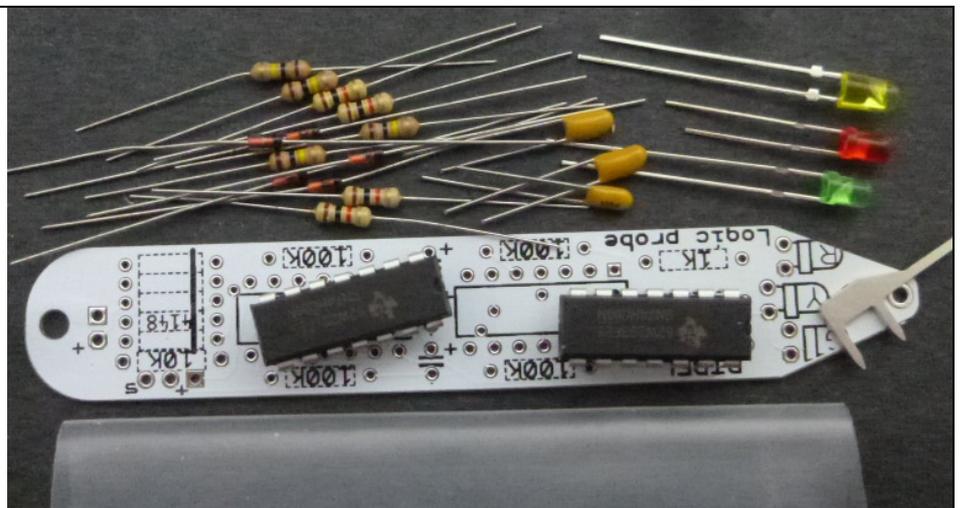
Let's consider a 5V microcontroller design. Most signals are digital. Zeros with a voltage close to 0V (< 1V to be safe), ones with a voltage close to 5V (> 3V to be safe). Floating signals have any voltage. The tip of LoPen is floating when not touching a signal. This is detected with 100 KOhm resistances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



The kit

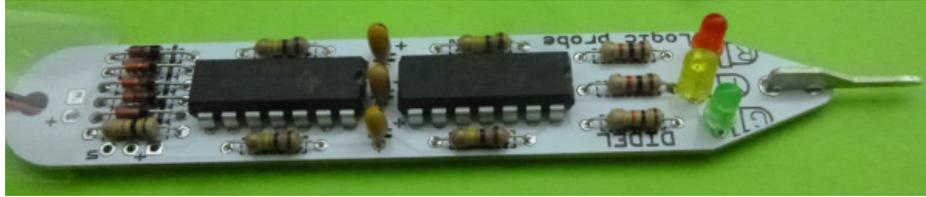
1	LoPen PCB
2	74HC00
5	1N4148
1	Led yellow
1	Led Dome
1	Led Dome
4	100k black
2	10k brown black yellow
2	1k brown black orange
3	1 uF brown black red
1	3-pin male strip



Plus 20 cm flex wire black and red, one pin and shrink tube 22mm flat 75mm long

Assembly

Just follows PCB marking. The general rule is to start with the components of small height: diodes, resistors, 74HC00, LEDs if horizontal, pin, capacitors.



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 polarity inversion.

We do not provide the connector. You surely have your own habits using 2.54 mm male or female pins, and have stocks.

Protection shrink tube

There is no real need to add a protection around the pen. It is just cleaner to add the shrink tube, if you have the good equipment. The tube is large and need some time to be heated, making the heat turn around. Avoid too much heat, the plastic power wires may not like it.

Have a good time soldering an using the LoPen Kit

Mini Lopen 60x10mm
Fully assembled and
tested.

We are using and selling
locally the Mini Lopen.
for many years. Also
available on Tindie.

