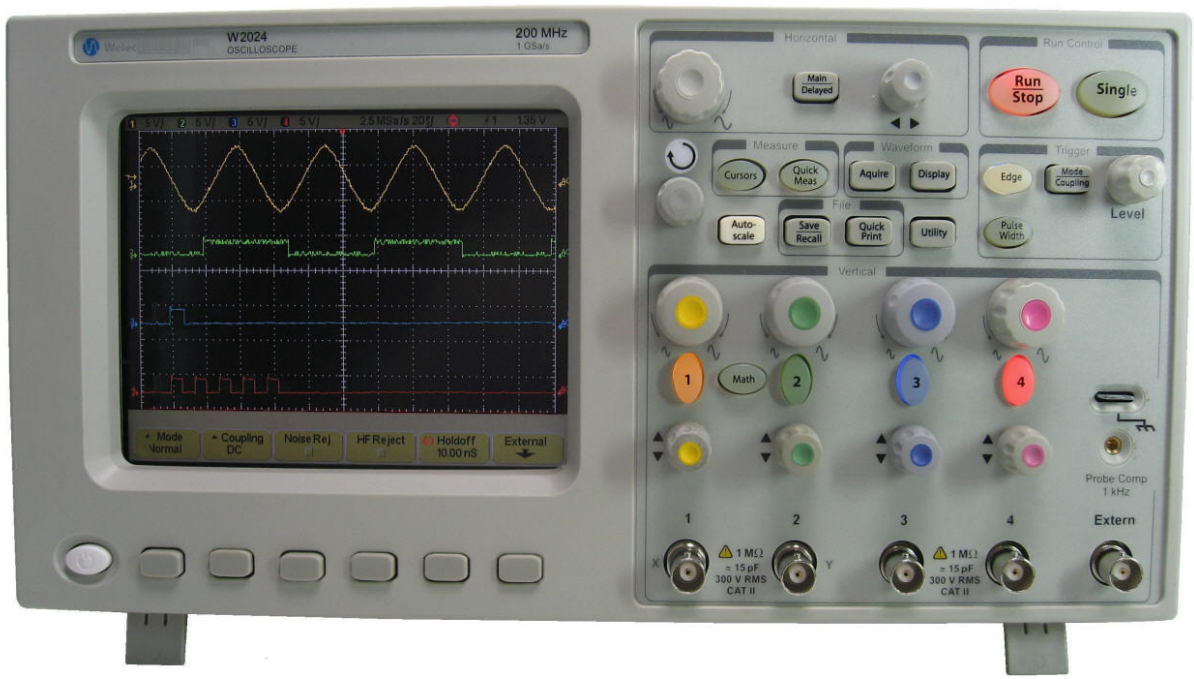
W2000A

Trigger LED Mod



20.11.2014

BlueFlash

Table of contents

Introduction

Hidden under the front panel in the trigger section there are two holes in the case which are used in the original design (copied from Agilent) for additional buttons. In the WELEC design those buttons are not available. Fortunately the soldering pads on the PCB under the holes are still existing and they are connected to the LED shift registers. That gives us the possibility to add two new LED for our own usage.

All kinds of LED can be used from SMD to standard types. An additional resistance is not needed. All we have to do is to open the case, solder two LED on the PCB and make a hole into the front panel cover. That's it!

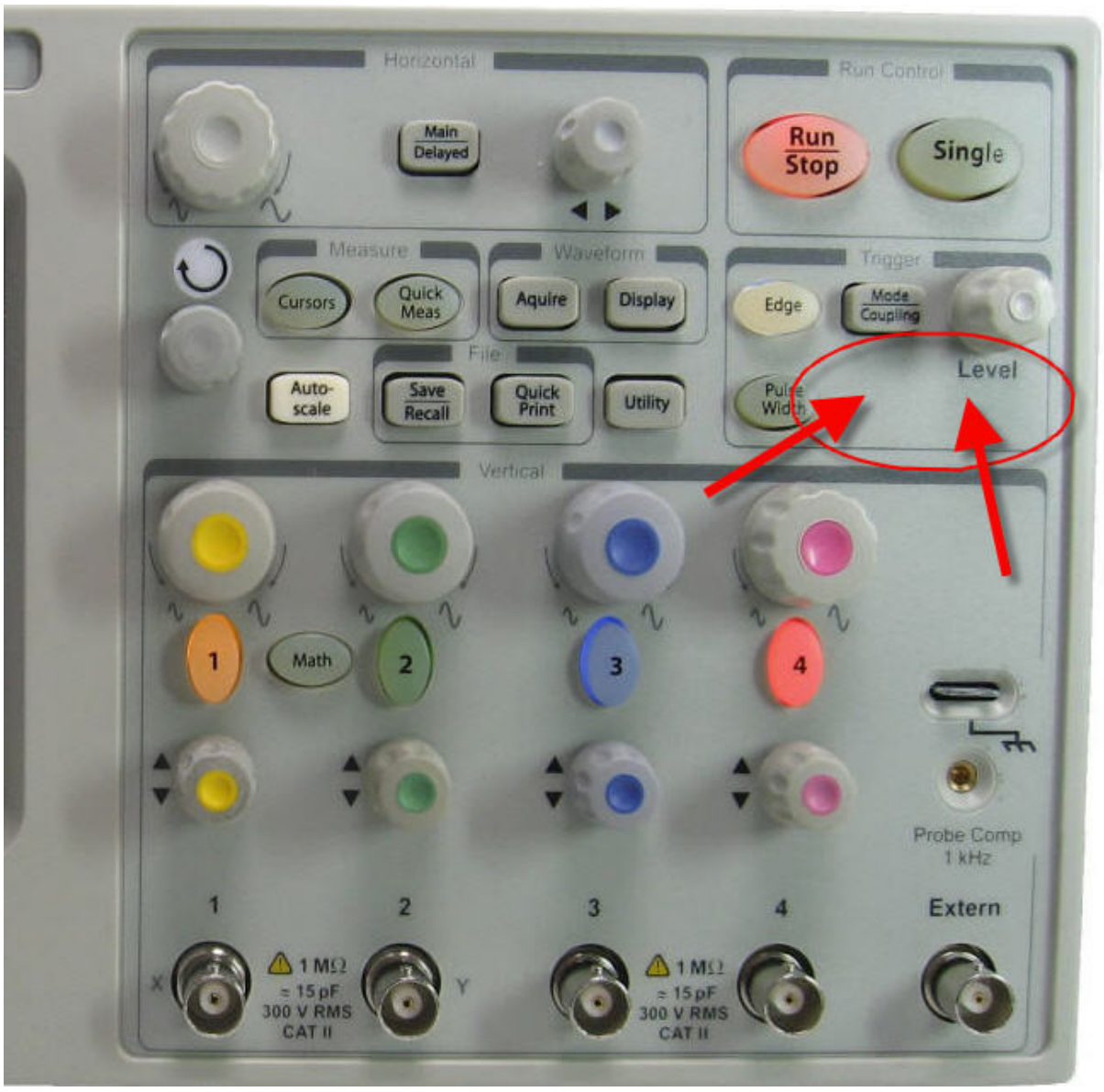


Fig 1: Hidden holes under the cover

Disassembling the DSO

Opening the backside is very easy. There are three screws that have to be removed. A little bit more difficult is the removing of the knobs on the front side. Pulling hardly may destroy the rotary encoder. Better is to lever off the knob with a small screwdriver.

The shaft of the rotary encoder has a flattened part which can be seen in the small gap between knob and front panel.

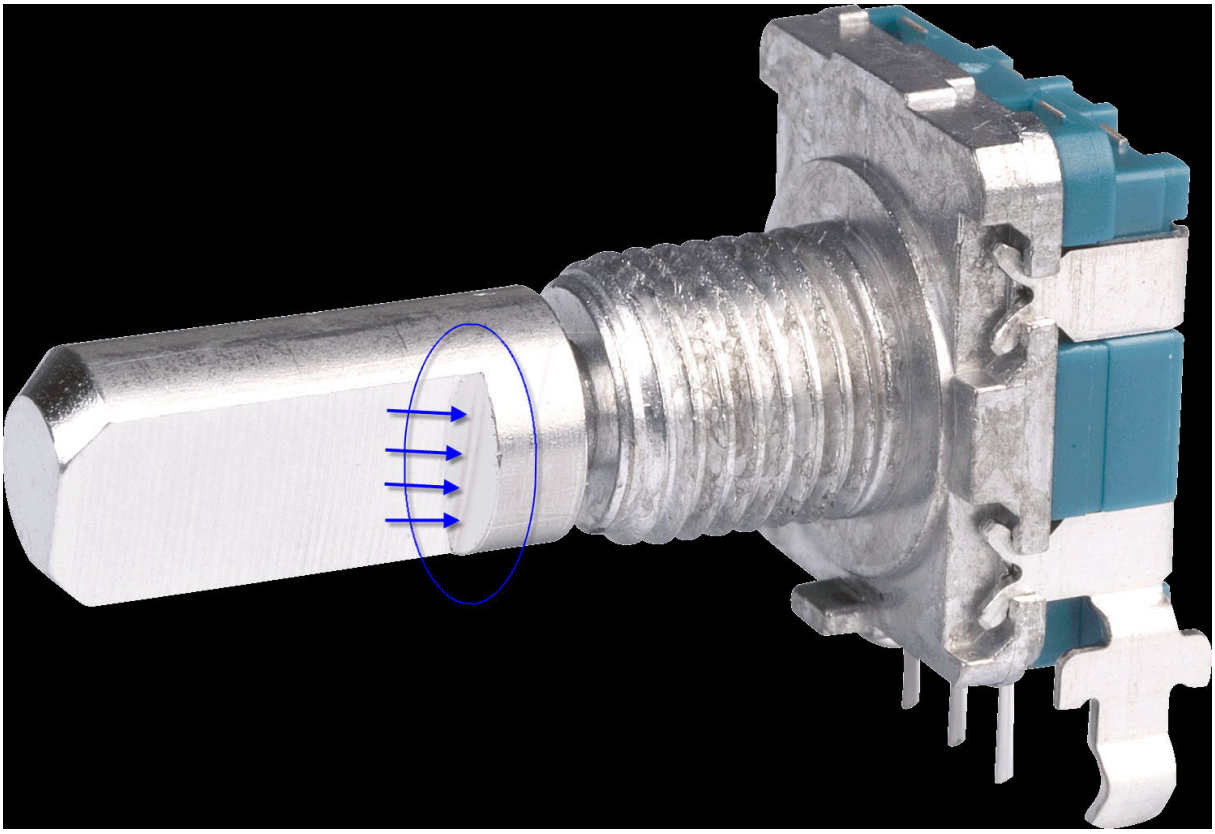


Fig 2: Shaft of the rotary encoder

Turn the flattened part up and insert the screwdriver into the gap. Now we can lever the knob off, using the edge of the flattened part (fig 2 and fig 3).

Fig 3: Lever off the knob

1. Remove power supply unit (4 screws). Pull off the two plugs coming from the display
2. Pull off the main display plug from the mainboard and unloose the screw which holds the mainboard. Also unloose the screwing of the BNC connectors. The mainboard now can be levered up with a little screwdriver against the metal frame at the same position as the little screw has been.
3. Remove the key PCB from the front panel backside.

What do we need?

- A metal drill with diameter smaller than the LED size if you want to make a little hole for the LED.
- A sharp knife (carpet cutter)
- A key file for widening the hole
- A hot glue gun if you want to use a big hole (and a little sheet of metal)
- Two LED (standard type or SMD) preferably red and green (or what you prefer)
- Soldering iron with fine tip

Preparing the front panel

You can choose between several variants. The simplest possibility is to keep the front panel unmodified. Due to the fact that the thin front panel cover is shining through, it is sufficient to solder a bright shining LED under the cover.

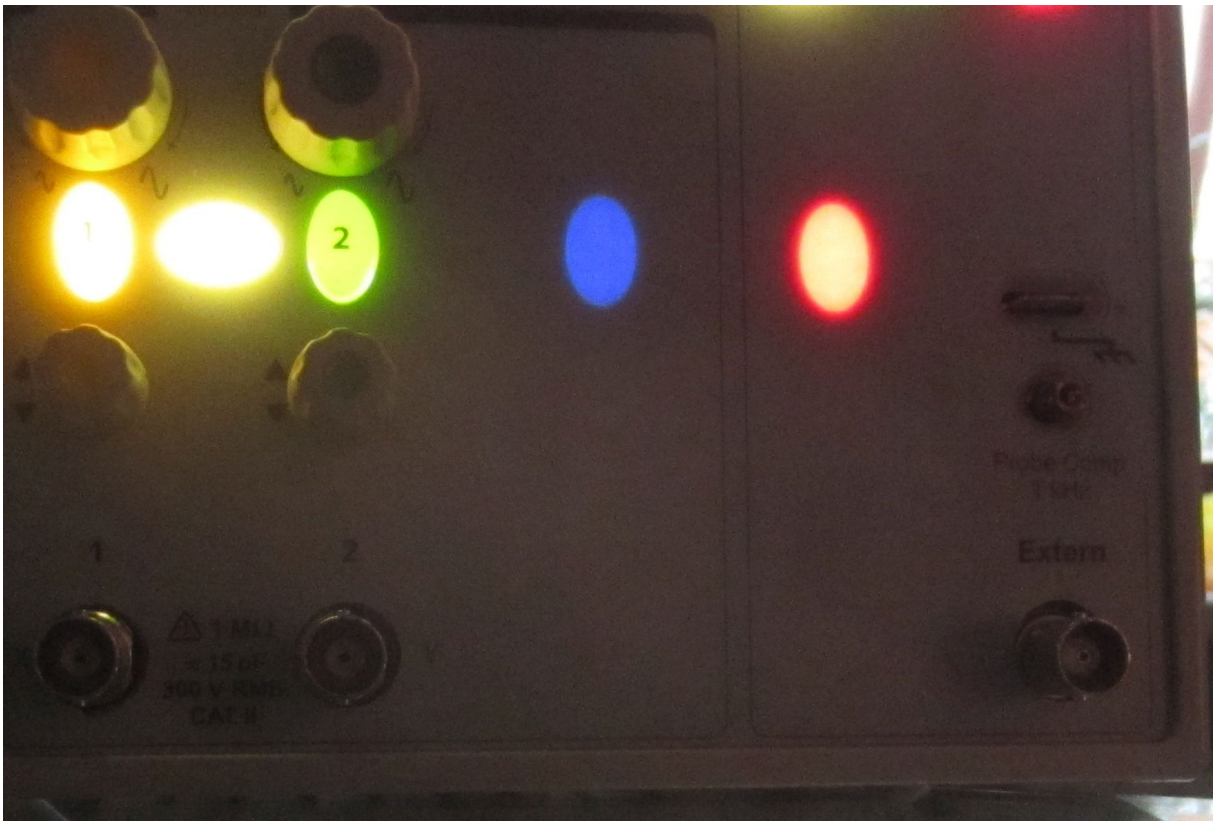


Fig 4: LED of channel 3 + 4 of a W2022A shining through the cover

Another possibility is to drill a little hole into the cover to let the LED outstand. In this case you have to work carefully because the cover tends to get chapped. Better is to take a drill that is a little bit smaller than the LED and to widen the hole with a file.

Fig 5: LED outstanding

The third variant is to open the hole completely and to fill it with hot glue. First you have to open the hole carefully at first with a knife and then with a file.

Fig 6: Holes in the cover

Now we are going to fill the holes with a thin layer of hot glue. Before we can do that we have to cover the hole with a sheet metal to get a nice surface. The sheet can be fixed with tape. Make sure that it cannot move anyway.

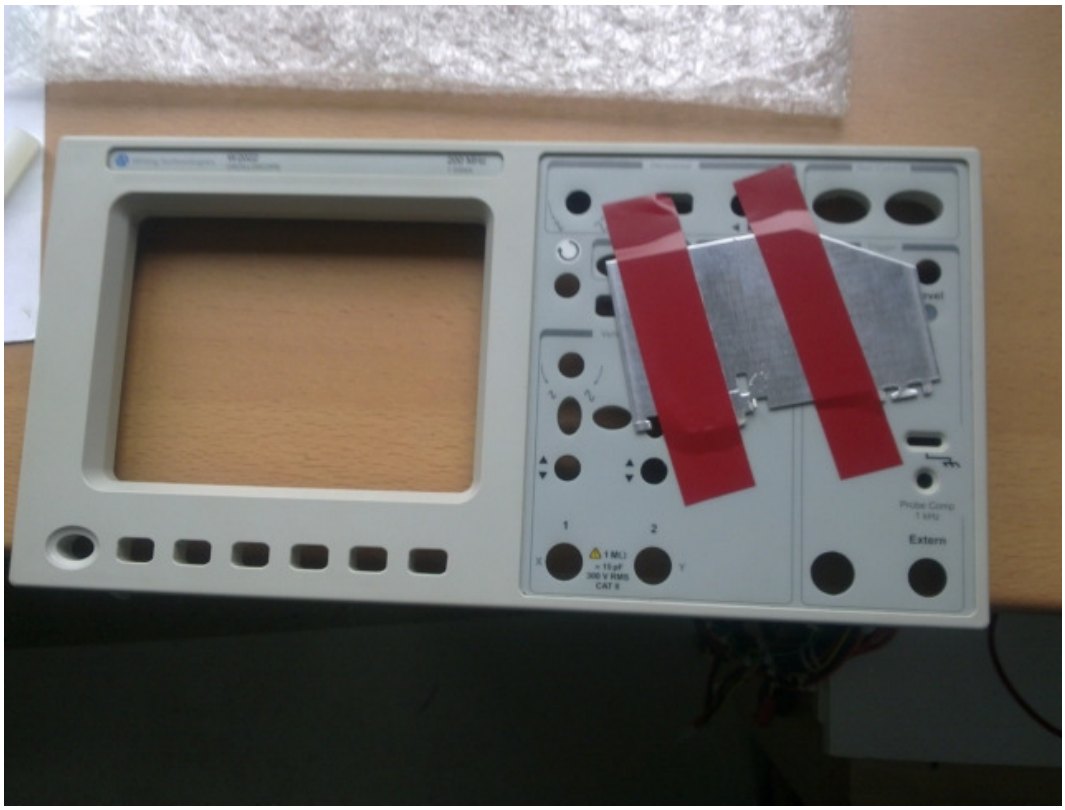


Fig 7: Sheet metal covering the holes (picture by Michael)

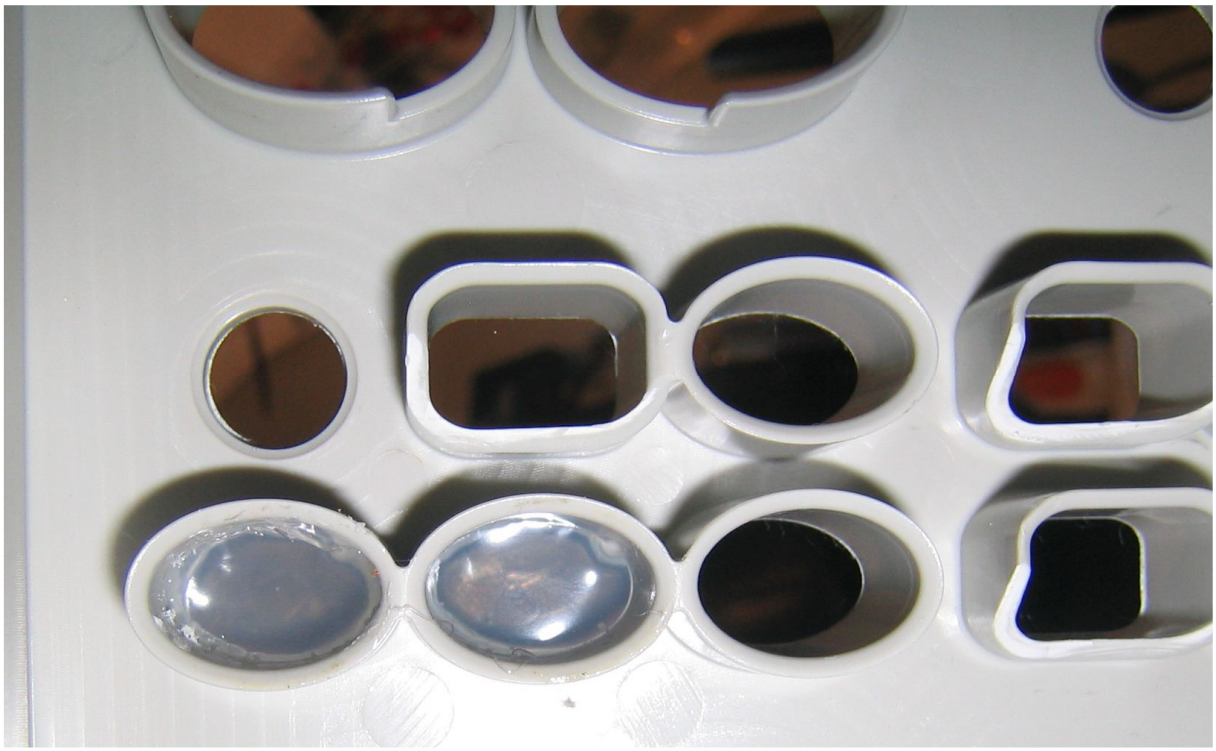


Fig 8: Hot glue coat from inside

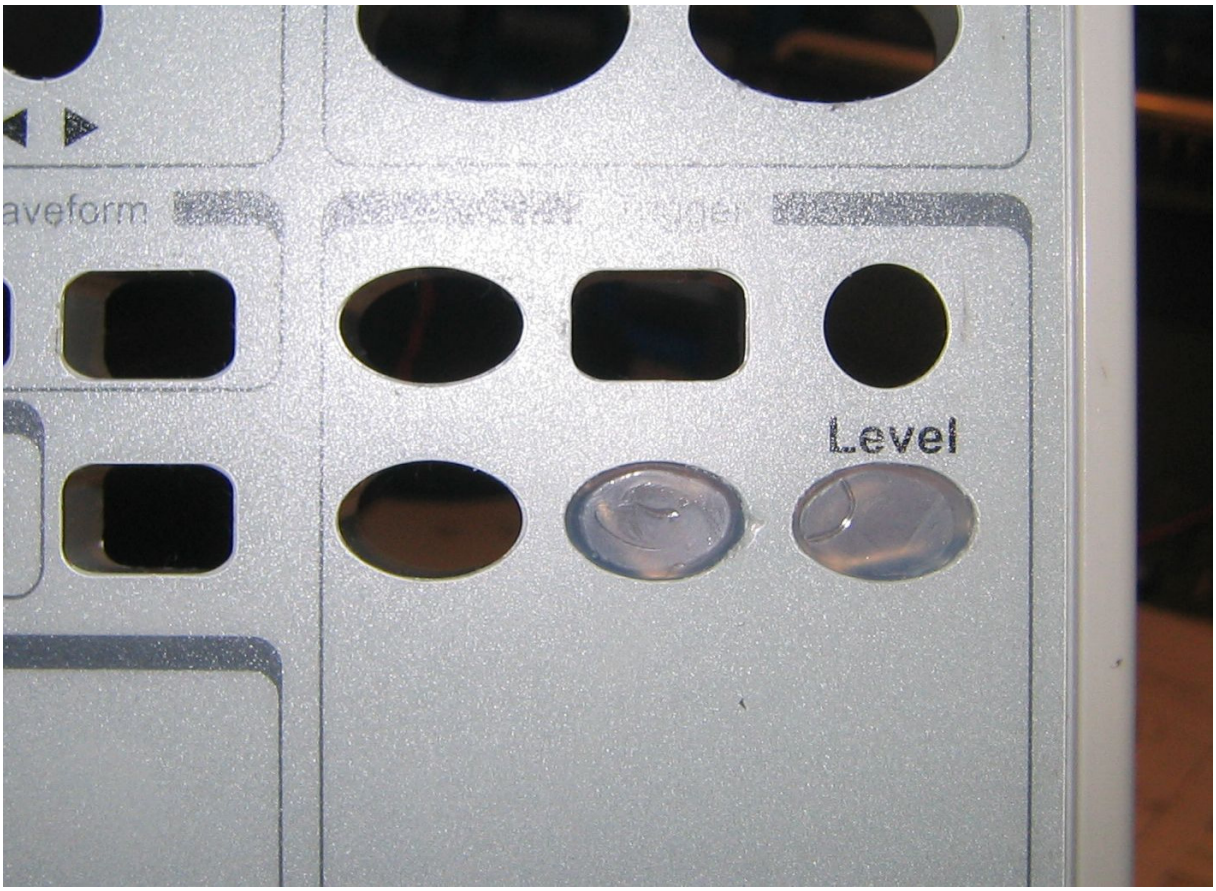


Fig 9: Hot glue coat from outside

Soldering the LED

Depending on the variant you`ve chosen you have to prepare the LED. If you chose the hot glue variant, there is only little space above the LED. So you have to solder SMD LED or to flatten the LED with a file. Be careful not to reach the anode or cathode of the LED with the file. This will destroy the LED.

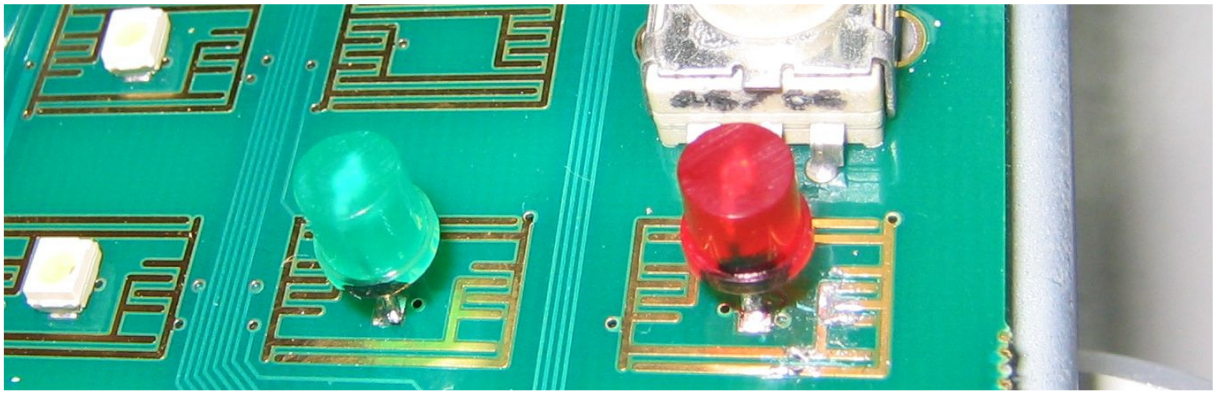


Fig 10: Flattened LED

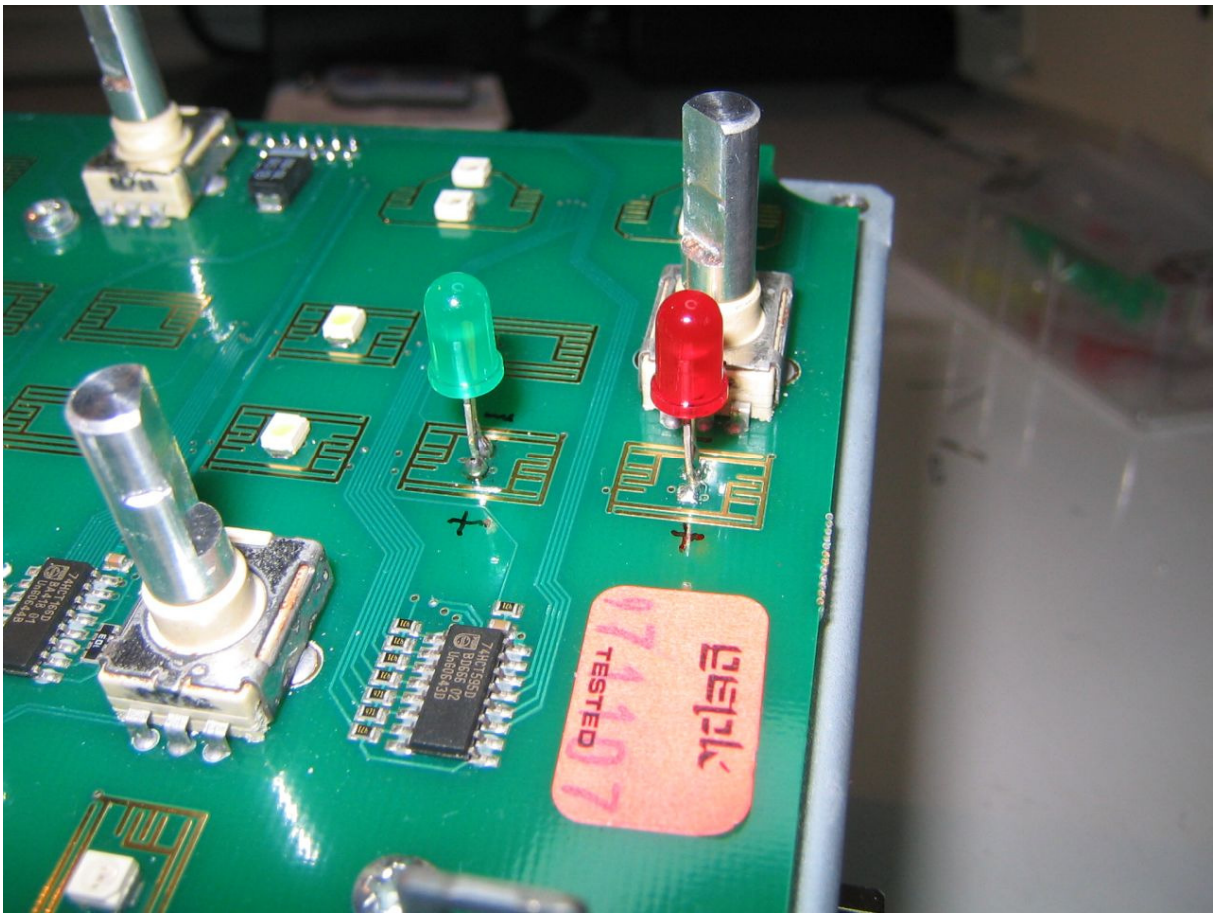


Fig 11: Standard LED with polarity marked on PCB

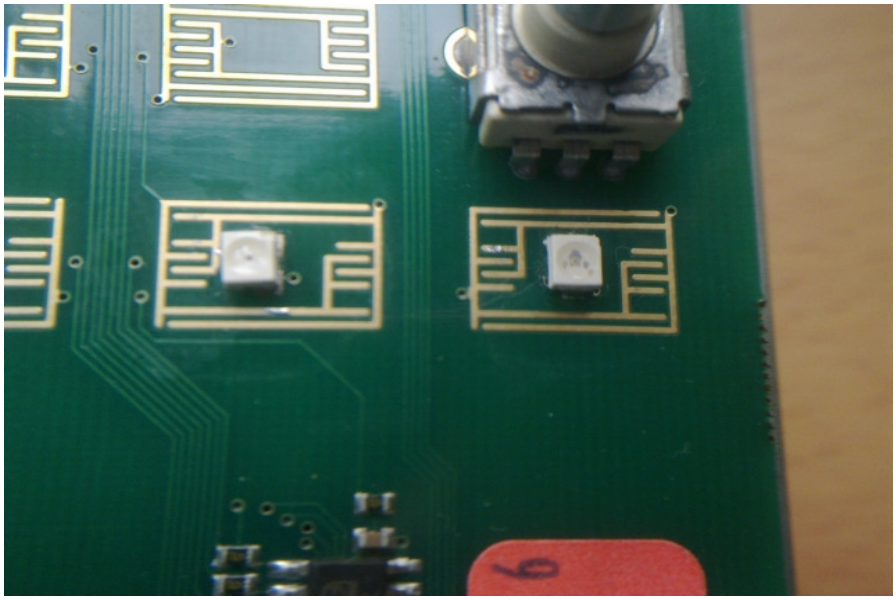


Fig 12: SMD LED (picture by Michael)

Conclusion

After assembling the DSO you have to check the trigger settings for the indicator LED in the trigger submenu. The channel 3 + 4 LED mapping should be switched off.

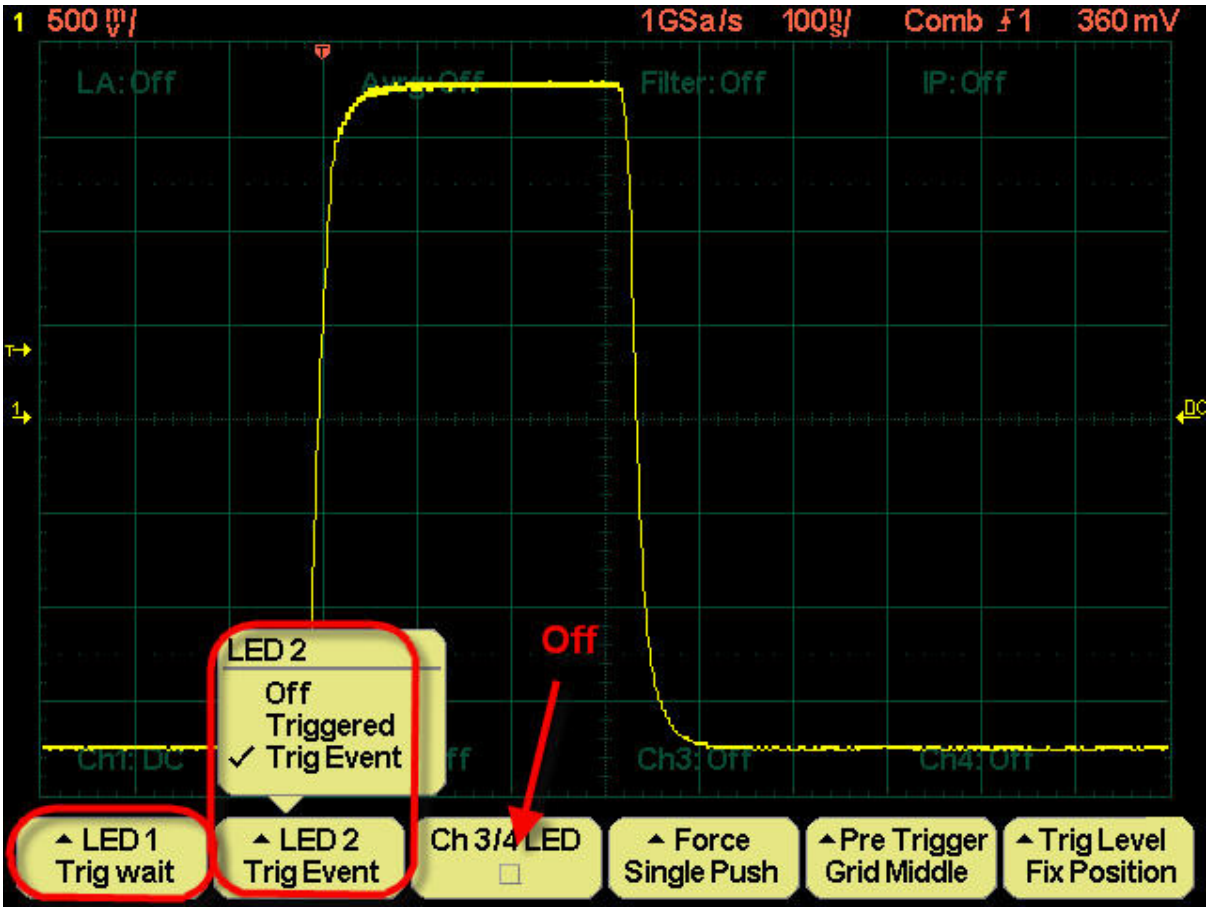


Fig 13: Indicator LED settings in the trigger submenu

LED 1 indicates the trigger wait cycle when activated. LED 2 has two possible settings:

1. Triggered: The LED will light up only if the signal is transferred from the ADC to the screen after a trigger event.
2. Trigger Event: The LED indicates every occurrence of a trigger event despite of signal acquisition.

Fig 14: LED in action