Assembling the PCBs

General information

Since I cannot recommend this project for beginners anyway (high voltage, surface mount, lots of solder joints, etc.), I will skip all the basic stuff and explain just a few things that might be of interest.

Controller

Start assembling the input protection section including the LED and the fuse. Install a jumper on the SWITCH header. According to the datasheet the circuit should protect against overvoltage up to 60V and against reverse voltage down to -40V.

Connect the board to a variable power supply. Start with 12V, the LED should turn on. If you increase the voltage, the LED should turn off at around 13.5V. If you decrease the voltage, the LED should turn off at around 10V. These are only approximate values.

Then assemble the +3.3V and the +5V supplies and check that all voltages are correct.

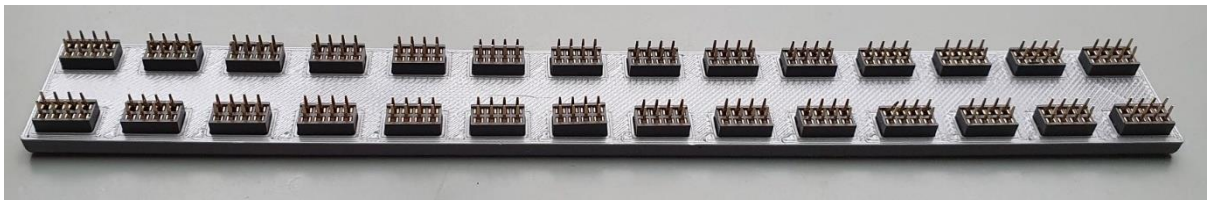
Don’t populate the SERIAL header.

Display and driver boards

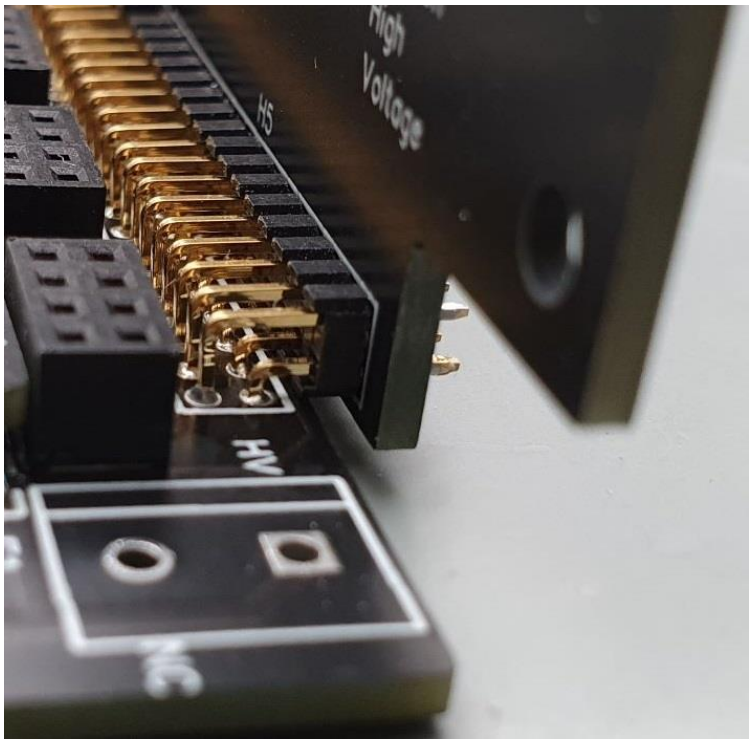
IN-16 / B-5870 Versions

Please note, that the B-5870 version also uses the IN-16 driver and the IN-16 display board.

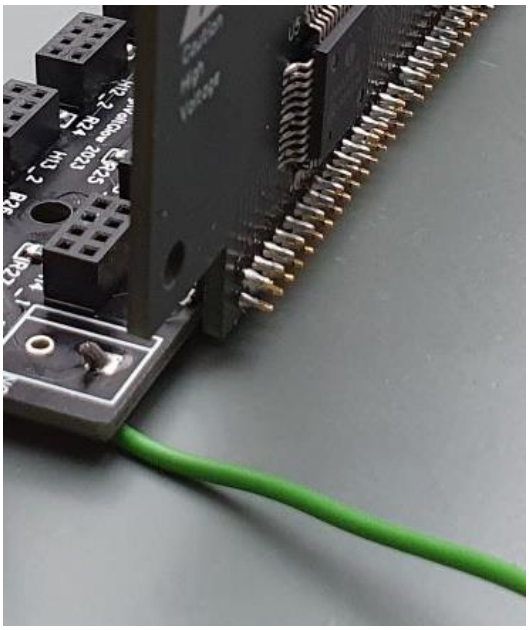
The IN-16 display tool (3D printed) can be used to keep things aligned, assuming you use header sockets with similar dimensions. Don’t use too much solder when soldering the socket headers or solder may flow into the sockets.



Driver and display boards must be soldered together as shown in the picture using right angle headers.



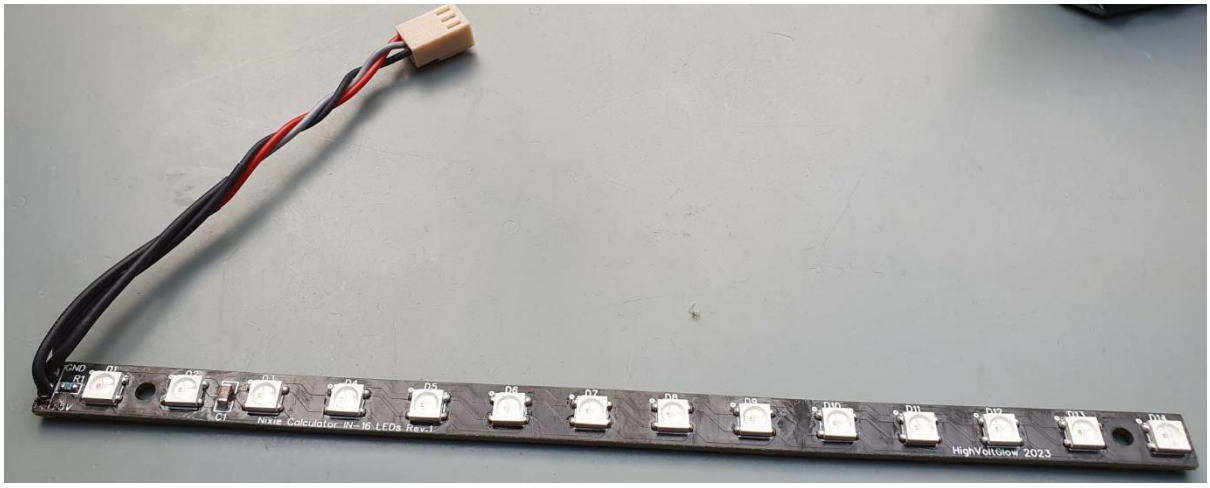
To connect the display board to the HV power supply I have soldered a wire directly to the board, but you can also use a 2-pin terminal block. The second pin is not connected.



Use heat shrink tube (black recommended) for the neon (minus sign). I had to extend the wires a little bit to get the correct height.

For the IN-16 version there are two options: LED backlighting or underlighting (recommended). For the B-5870 only backlighting is available.

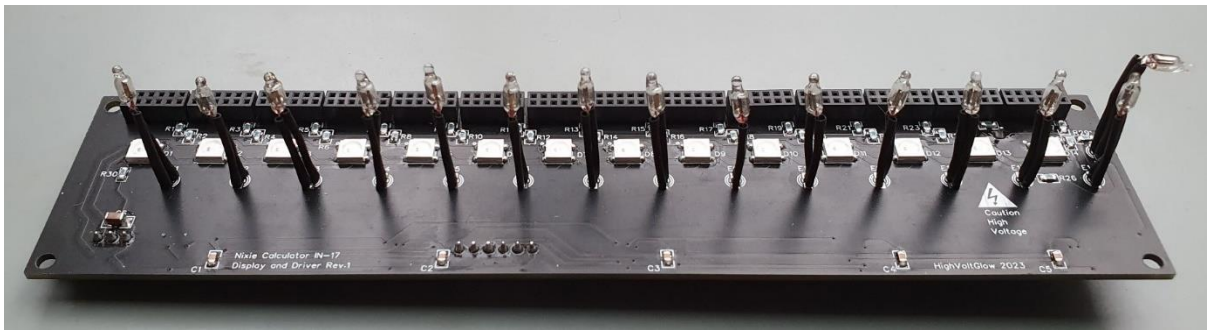
For the IN-16 underlighting you must use the additional IN-16 LED board. Solder the 3-wire cable directly to the board. Use some black heat shrink tube to hide the cables behind the acrylic. Don't populate the LEDs and the LED connector on the driver board.



For backlighting, populate the LEDs and the LED connector on the driver board.

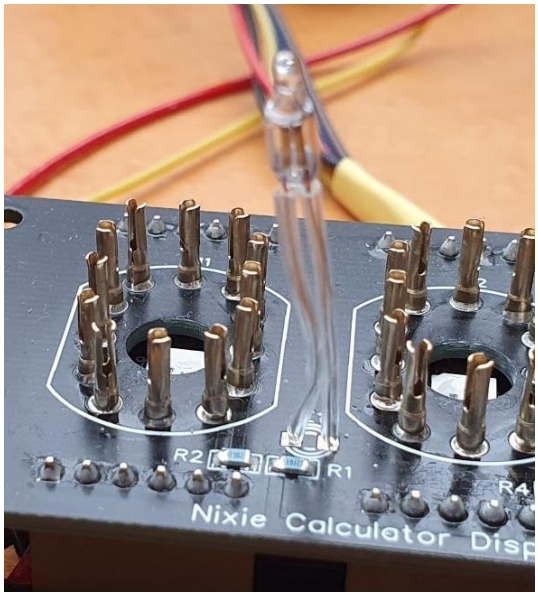
IN-17 Version

Use heat shrink tube (black recommended) for all the neons.



IN-12 Version

Use heat shrink tube for all the neons.



Peripherals module

Use heat shrink tube for the LED. Solder the cables directly to the board.