



# Ersa i-CON soldering station display backlight replacement

Shows how to replace failed display backlight LEDs in Ersa i-CON 1 and i-CON 2 soldering stations.

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## INTRODUCTION

We have about 25 of these soldering stations in my workplace, but after 5 or 6 years of use, their display backlight started to fail. Without backlight, the display is almost illegible. Since 4 stations have developed this problem so far, I've decided to look into it.

Ersa doesn't offer standalone replacement displays, they force you to buy a new control board. It costs whopping 160 EUR, which is almost half the price of a new soldering station. It is possible to buy replacement displays [in this American e-shop](#), but shipping costs to Europe start around 100 USD. That's better, but still not exactly cost-effective (50 USD displays, 100 USD shipping). In reality, the displays are probably manufactured somewhere in China, but I couldn't identify their original manufacturer, nor I was able to find other source (Ebay, Alibaba...) for them. If someone finds them, please let me know in the comments. Here are markings that are on the back of the display:

PRE-WU2495B-01

ED-5455-LED/A ROHS

0712FJB\*1094/0107/1\*6

Anyway, since I couldn't get new displays for reasonable price, I decided to replace burned backlight LEDs in the displays. I used LTW-108DCG-HS10 as replacement LEDs in this guide, but any miniature white LEDs with at least 1000 mcd luminous intensity should do. See step 14 for more information.

### TOOLS:

- T20 Torx Screwdriver (1)
- Slip Joint Pliers (1)
- Soldering Iron (1)
- Sharp knife (1)

### PARTS:

- SMD resistor 220R, 0603 package (1)
- Replacement white right-angle LED Line-On LTW-108DCG-HS10 or similar high brightness type (1)

## Step 1 — Pull off control knob



- Pull off the control knob using flat-head screwdriver or similar tool.

## Step 2 — Remove bottom screws



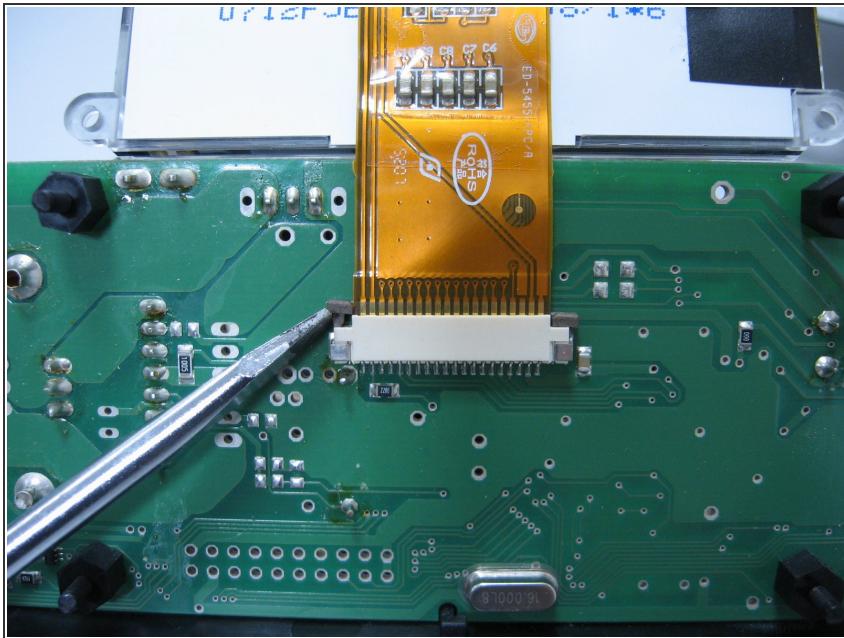
- Flip the station over and remove 4 screws with T20 screwdriver. Then flip the station back and pull up the top cover.

## Step 3 — Remove display nuts



- Remove 4 plastic nuts around the display with pliers or similar tool.

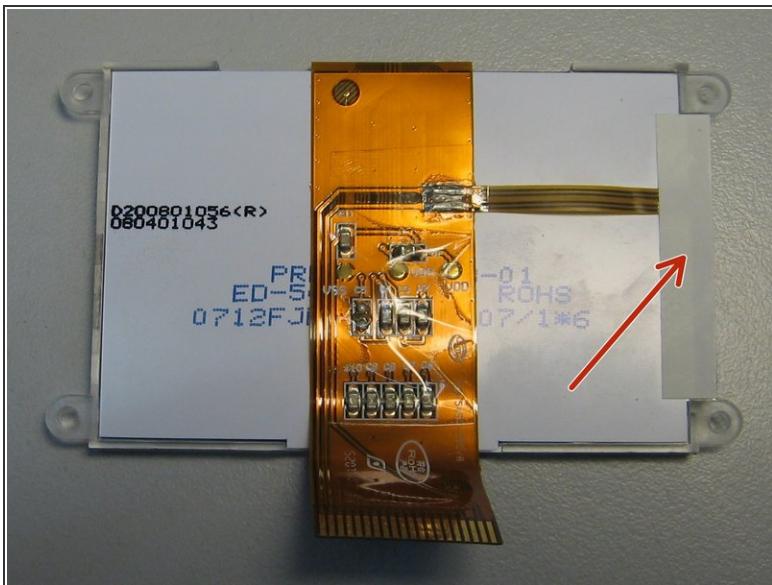
## Step 4 — Disconnect the display



- Carefully flip the display upwards. Then loosen the flat cable connector by pushing up small brown bars on both sides. Pull the flat cable from the connector.

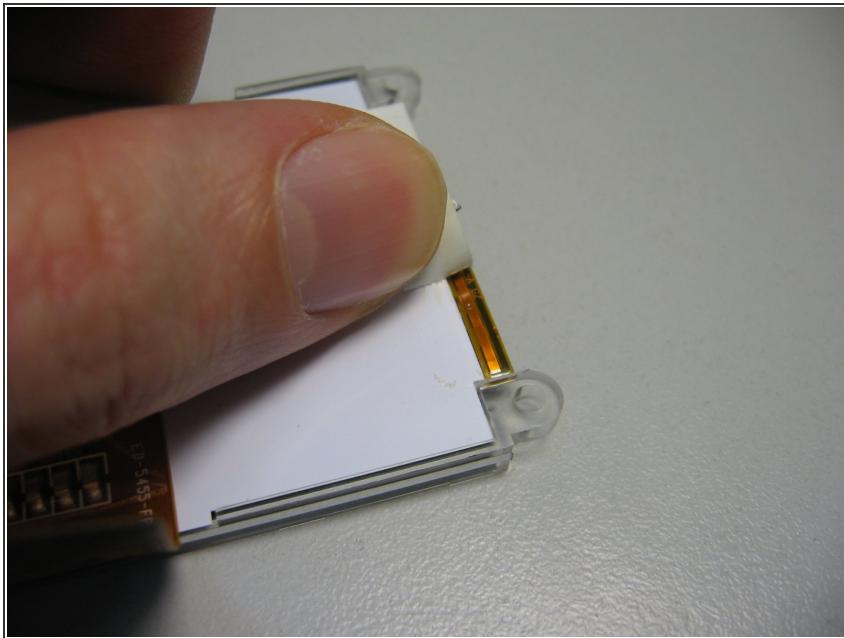
*i* If you have replacement display, you can simply connect in the new one. Then you can assemble the station back together and you're done.

## Step 5 — Locate the display backlight



- Display backlight is hidden under white tape on the right side.
- The second photo shows markings on the display.

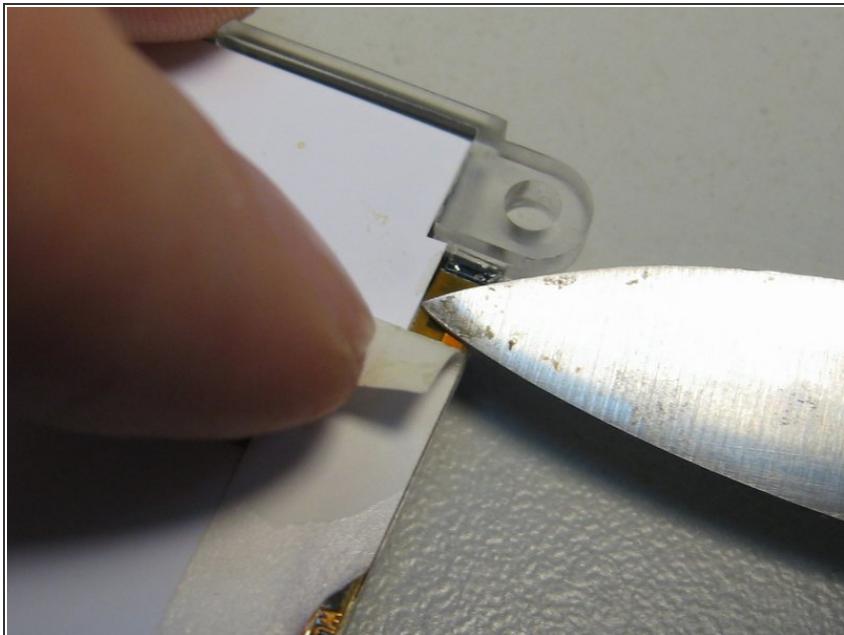
## Step 6 — Remove cover tape



- Carefully remove the white cover tape. It's best to use a knife or similar tool.

 Make sure the golden flexible circuit board strip doesn't bend upwards along with the cover tape!

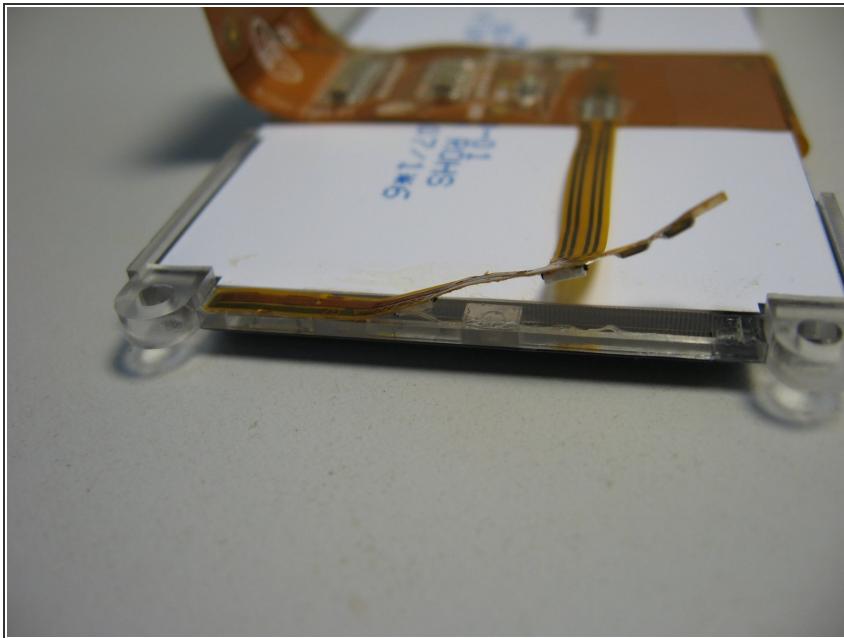
## Step 7 — Remove cover tape



- You can hold down the circuit strip with a knife or similar tool to unstuck it from the cover tape.

 Be careful if you decide to wash away strip glue residue with alcohol. If it seeps between various layers inside the display area, it may develop unsightly spots.

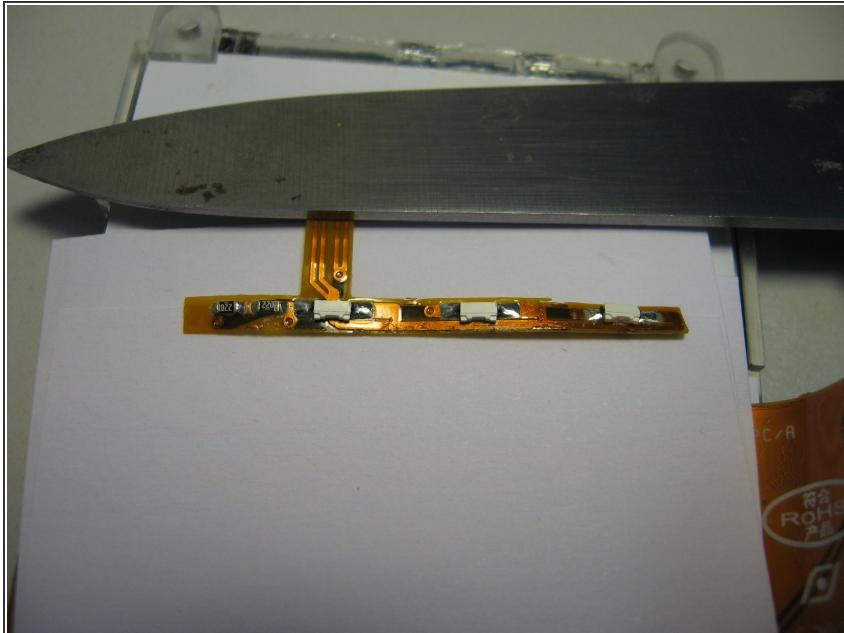
## Step 8 — Unstick the circuit strip from the base



- Carefully unstick the circuit strip from the plexiglass base with knife.
- The strip is glued in with a thin transparent double-sided tape. Make sure the tape stays on the plexiglass base. If it tears away along with the strip, use knife tip to push it back onto the plexiglass.

 Try to bend the strip as little as possible, otherwise it will be difficult to seat it back in properly later.

## Step 9 — Desolder original backlight LEDs

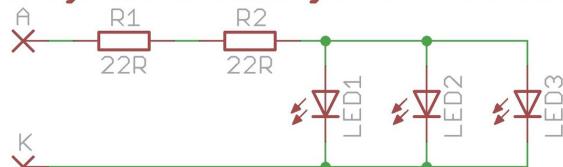


- Fold the circuit strip onto display's back cover and weigh it down. This will reveal the faulty original LEDs and some resistors.

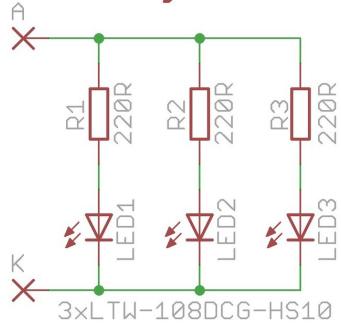
 Place some heat-resistant material under the strip before soldering. If you melt display's plastic back cover, it will develop unsightly spots. I'm using several sheets of paper in the photo.

## Step 10 — Backlight schematics

### Original backlight schematic

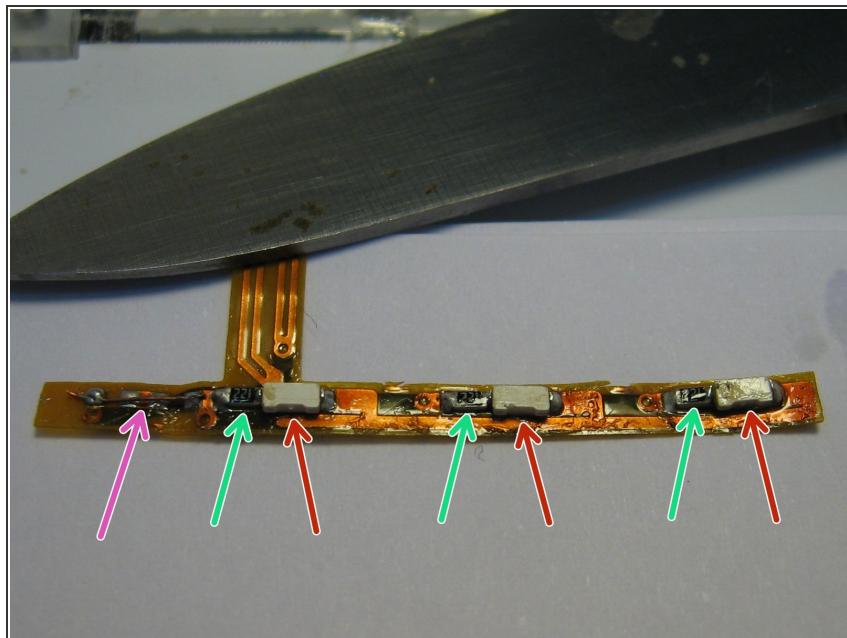


### New backlight schematic



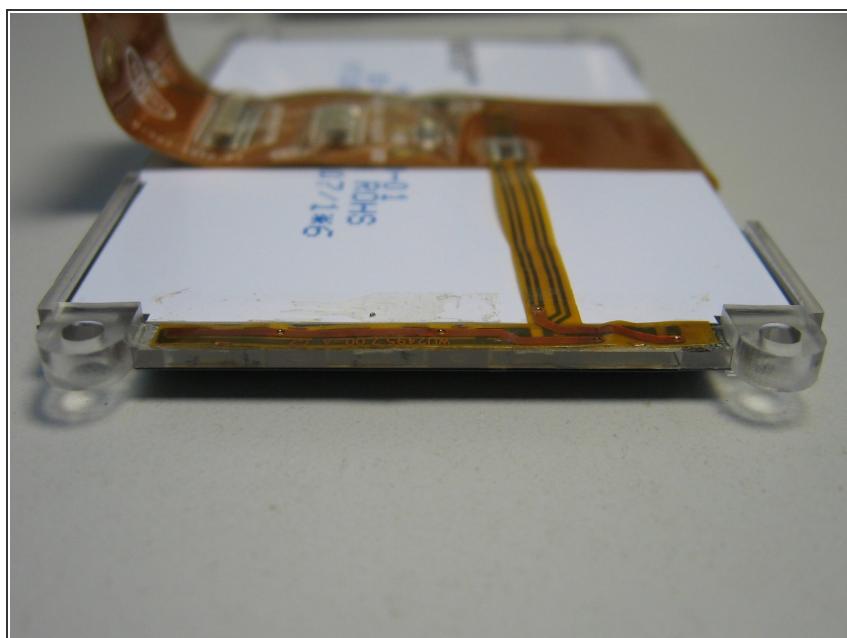
- I analyzed original backlight connections and it's apparent why it fails: Chinese comrades who designed the display wanted to save some money and/or space and connected the LEDs in parallel.
- Of course, every LED has slightly different threshold voltage. As a consequence, one of them draws more current and fails (burns open) prematurely. The remaining two LEDs are then subjected to even higher currents and burn soon afterwards, too.
- Thus I decided to change the connection according to the lower schematic - I shorted the original 22R resistors and put a 220R resistor in series with each new LED.

## Step 11 — Solder in new components



- Fortunately, there is enough room on the strip to solder in new LEDs (red arrows) along with their 220R resistors (green arrows) on the original solder pads. It's ugly, but it works. You have to use resistors in 0603 package to fit them into the available space.
- Note that I also desoldered the original 22R resistors and shorted their pads with a thin wire (purple arrow).
- You can verify that all three new LEDs work by connecting a 5V power supply onto "A" and "K" pads on the strip.

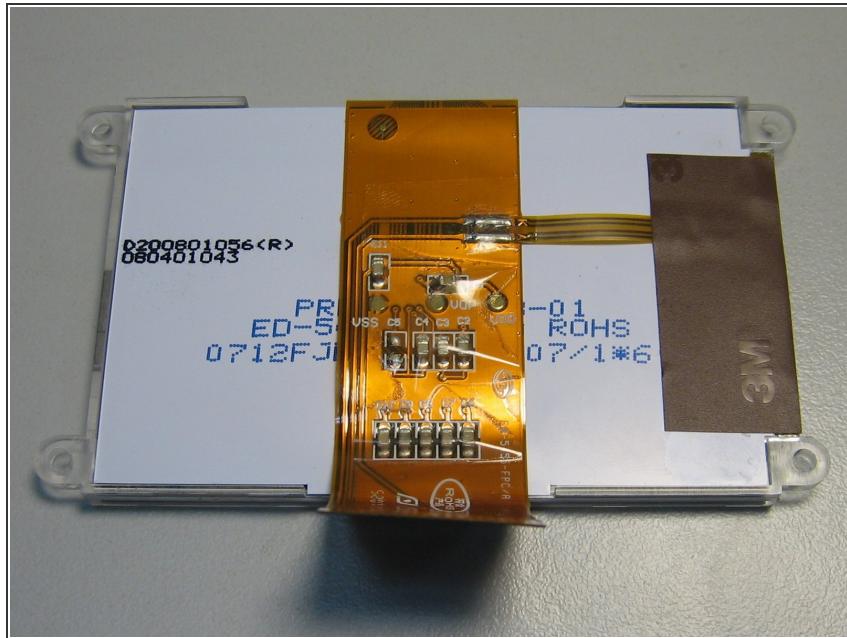
## Step 12 — Seat the strip back onto base



- Stick the circuit strip back onto plexiglass base.

**⚠** Remember that the new components are a bit wider, so make sure the strip doesn't bulge or stick out anywhere. If it doesn't fit properly, unstuck it and try a slightly different position.

## Step 13 — Secure the strip with new cover tape



- Secure the strip in place with new tape cover. I used brown electrical tape in this photo.
- Then you can reassemble the soldering station.

## Step 14 — Final result



- Here you can see comparison of original (left) and new backlight (center). The new backlight is slightly brighter than the original; you can use larger resistors (270 or 330R instead of 220R) to lower the brightness.

- I also experimented with general-purpose VLMW11R2S2-5K8L-08 omnidirectional LEDs. You can see the result on the station on the right - the display is rather dim and there is significant backlight bleed on its right edge, where the LEDs are located. Thus I recommend to use only directional, right-angle LEDs like LTW-108DCG-HS10.
- Since new LEDs need lower current to achieve similar light output, they should outlast the soldering station. This "trick" is generally applicable; high-brightness LEDs always generate more light at 2 mA than ordinary LEDs at 20 mA. At the same time, they consume less power, generate less heat and last much longer.

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To reassemble your device, follow these instructions in reverse order.