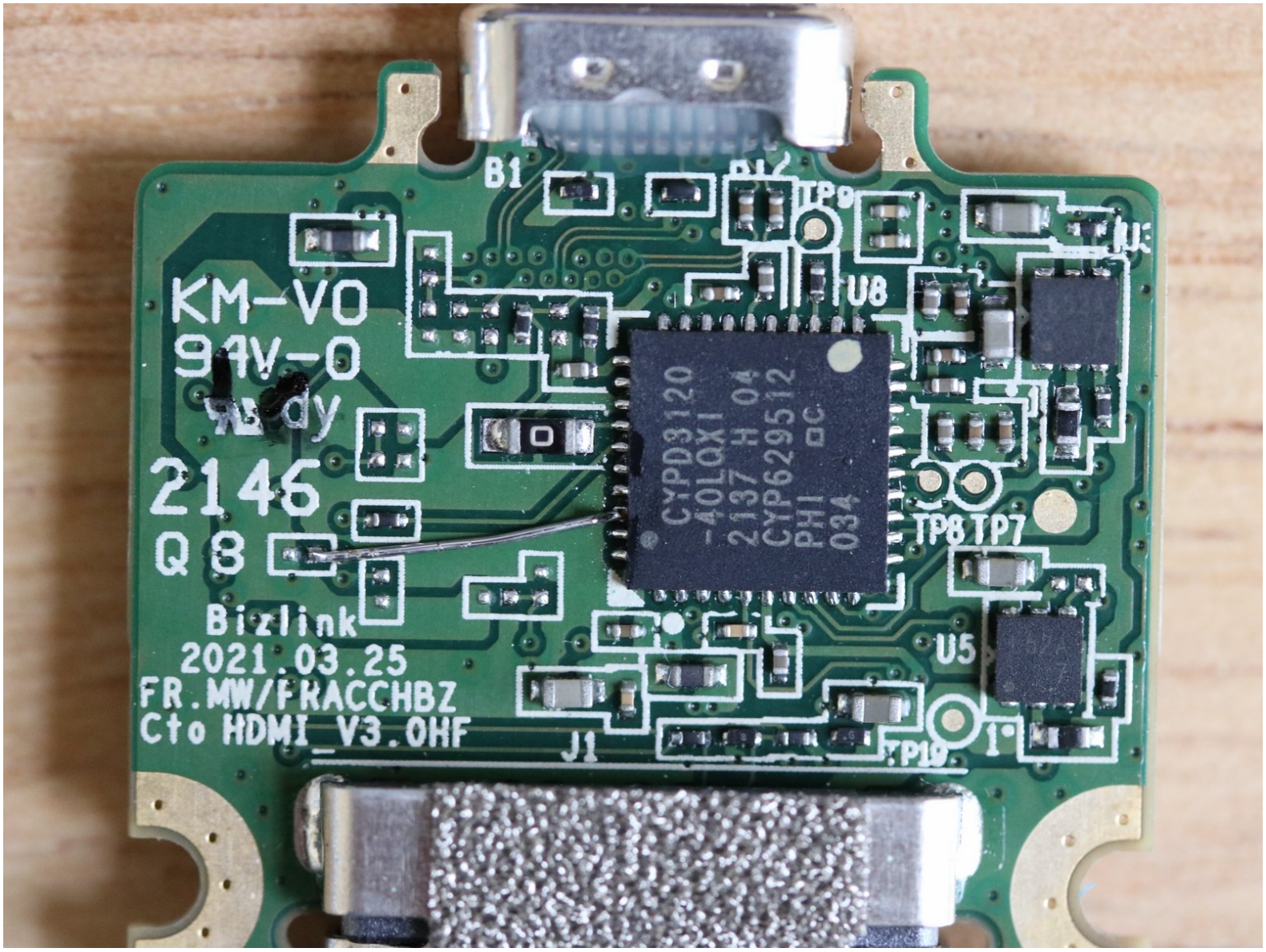
HDMI Expansion Card power saving rework (Beta)

Reworking an HDMI Expansion Card to enable the new power saving mode.

Written By: Nirav Patel



© 2025

INTRODUCTION

After over a year of prototyping and experiments, we've been able to come up with a way to reduce system power consumption when an HDMI Expansion Card is present, by making the card pretend that it is not a display output when there is no monitor connected.

You can rework an existing HDMI Expansion Card to have this behavior by following this guide to solder a jumper wire internally and flash new firmware to it. Note that this requires advanced soldering skills, so we recommend that you only try it if you're familiar with extremely fine-pitch SMT rework and have the necessary tools for it. **Damage caused by failed reworks is not covered under warranty.**

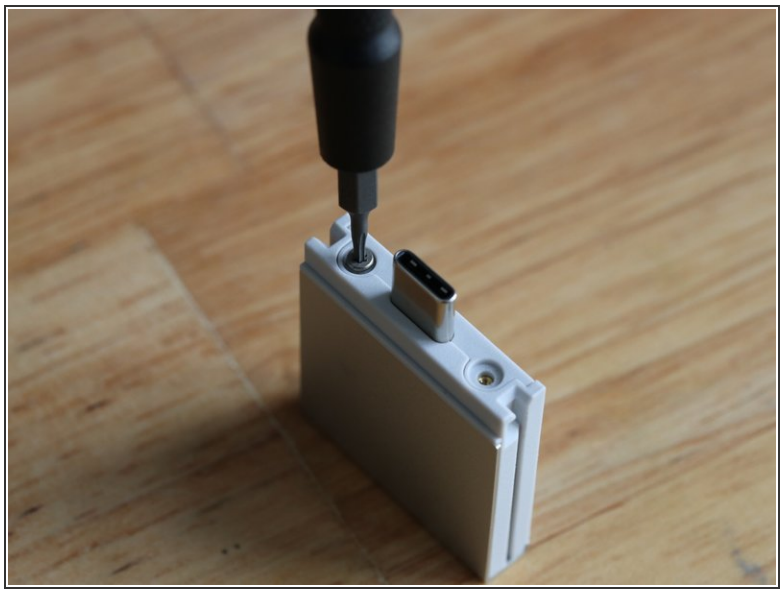
Beta release: Note that the firmware and instructions are still in beta, so there may be further revisions. The firmware update tool from our supplier currently is only available for Windows. We're also running a beta test with 2nd Gen HDMI Expansion Cards with Batch 1 of 13th Gen that has a slightly different modification.

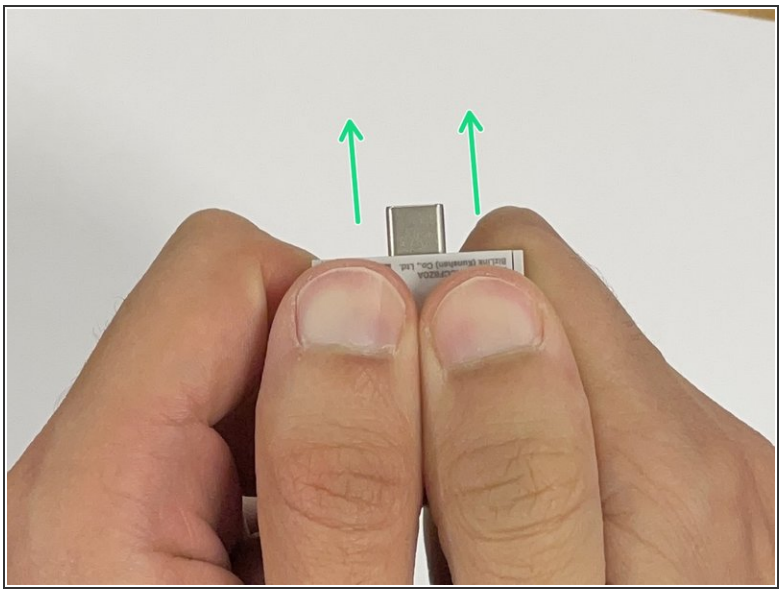
TOOLS:

- Framework Screwdriver (1)
- Soldering iron (1)
- Microscope (1)

© 2025

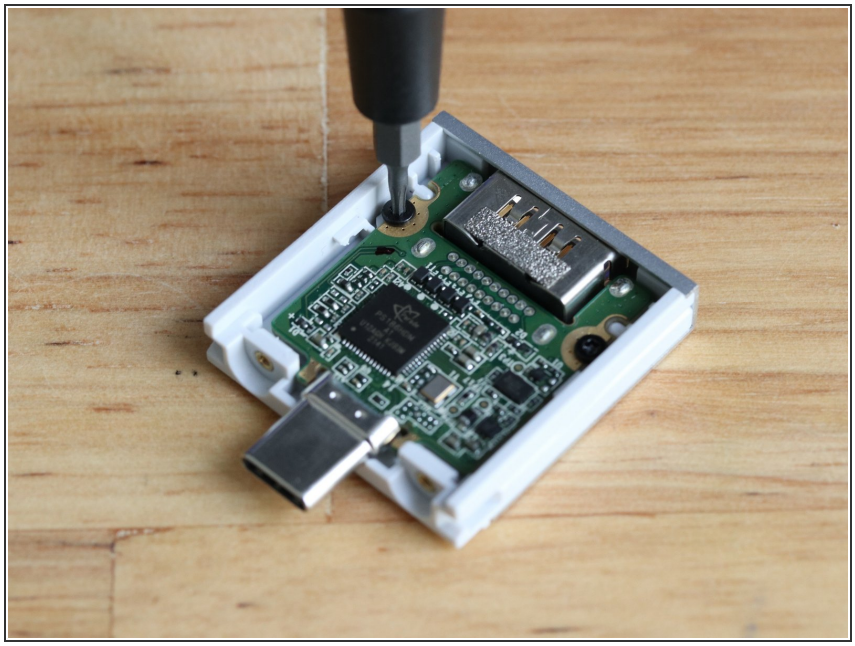
Step 1 — Remove the lid





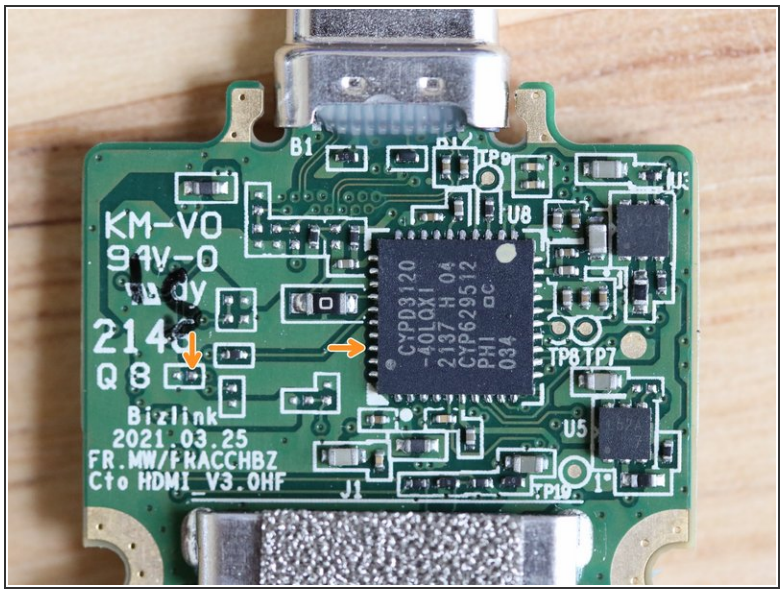
- With the T5 bit in your Framework Screwdriver, remove the two fasteners holding the lid onto the Expansion Card.
- Hold the Expansion Card with both of your thumbs on the lid and slide the lid towards the USB-C plug. It will take a little force to get the lid to unlatch.

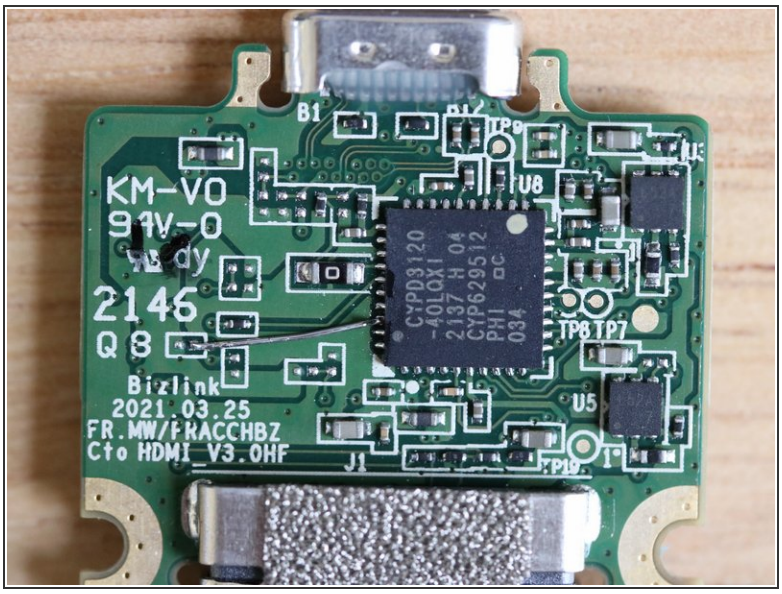
Step 2 — Unscrew the PCB



- Using the T5 bit in your Framework Screwdriver, remove the two fasteners that hold the PCB in. This will let you get to the underside of the PCB, where you'll solder the jumper wire.

Step 3 — Solder the jumper wire





- This is the hard part! We recommend using a 28 AWG solid wire about 7mm long, along with a microscope, tweezers, a fine tip soldering iron, a tiny amount of solder, and some soldering flux. It takes very little solder to make the connection.

  ⓘ If you're at this point looking at the tiny pads and wondering about the steadiness of your hands, it is totally ok to turn back now rather than risking damaging the card. This is definitely a non-trivial soldering exercise.

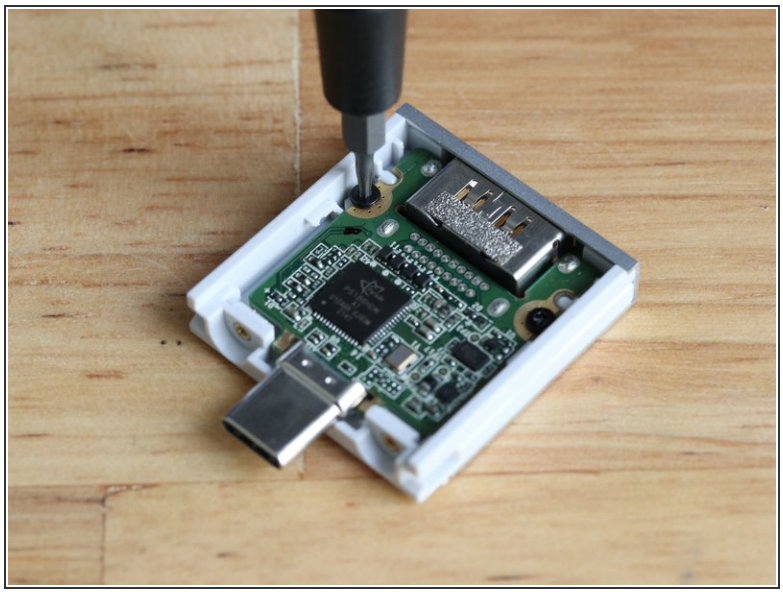
- In the first image, you can see the two points that need to be connected. The right pad on the unpopulated resistor footprint, to the third pad on the IC.

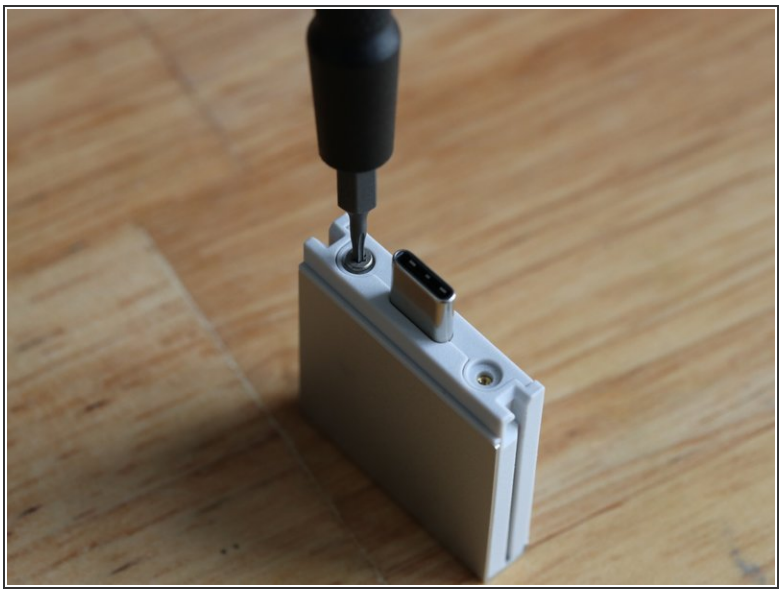
  ⚠ If your HDMI Expansion Card has a resistor on the footprint that the left orange arrow is pointing to, remove the resistor first.

- In the second image, you can see an example of a wire soldered into place. Note how little solder is used for the connection. Be extra cautious to not use too much solder, bridging to other contacts, but enough solder that the circuit is solid. Take a close look with a microscope to ensure the solder joint is good.

© 2025

Step 4 — Re-assemble the card

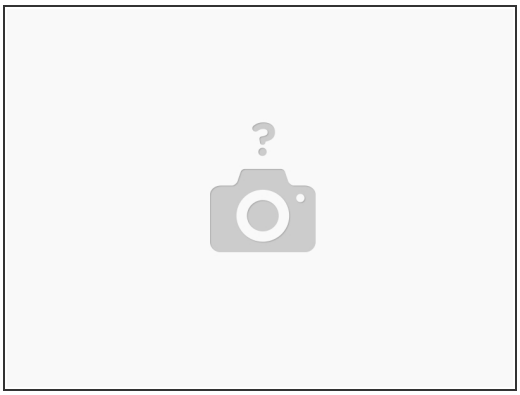




- Screw the PCB back into place using the two black T5 fasteners.
- Slide the lid back on, and screw it on using the two silver T5 fasteners.

© 2025

Step 5 — Update the firmware



- Now that you've completed the hardware part of the rework, you can reflash the HDMI Expansion Card with the new firmware. Note that we currently only have a Windows-based updater available from our supplier.
- Download the HDMI Expansion Card version 105 firmware here. Unzip it. With the HDMI Expansion Card plugged in, run Framework_HDMI_Card_3.0.16.105.exe. After the update completes, you can run Framework_ReadVersion.exe to confirm that both "Image 1 version" and "Image 2 version" state 3.0.16 build 105.
- We also recommend marking the card in some way to indicate that you've modified it, in case you have multiple cards in the future.

With the rework completed and the firmware flashed, you can expect to see improvements in power consumption in different scenarios. Make sure you're also running the latest firmware on your laptop to see the full results.

© 2025