Brio rework kit

Brio rework kit mk1 and mk2 documentation and rework instructions

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Brio rework video instructions

Detailed video how to perform "surgery" on Brio camera

Tools and kit content

Kit includes all necessary fasteners and hex keys to put your new camera together.

- Hex keys
  - M2x20x83
  - M1.5x17x75
- Screws
  - DIN912 M1.6×4 – 6 pcs (camera PCB)
  - DIN912 M2x3 – 2 pcs (microphones)
  - DIN912 M2.5×8 – 4 pcs (enclosure)
  - DIN912 M2.5×10 – 2 pcs (enclosure)

But some other tools are required:

- Knife, tweezers or small flat screwdriver to separate parts attached with double sided adhesive tape
- Small Philips screwdrivers to disassemble new camera. (Wera and Wiha PH0 screwdriver for all the screws and PH00 for lens assembly were perfect match). Some PH00 (lower quality?) screwdrivers will not fit so PH000 might be needed.
- Soldering iron to remove surface mount LED and lens assembly pins

Extract bare camera assembly

Recently Logitech released it’s newest camera BRIO 4K (8.8 Megapixels, wide dynamic range, great white balance, up to 90fps, USB3.0). Just like previous models it has fixed angle lens, which in some cases it is not enough. This is where custom housing for exchangeable C and CS-mount lenses comes in handy. And there are vast variety of these lenses: fish-eye with Field of View (FOV) of 180° and more, telephoto with great magnification, fixed zoom, adjustable zoom, motorized, macro, telecentric and many more. Also you will gain ability to attach it to other optical and scientific instruments like microscopes or telescopes.

Previous attempt to make kits for C920/C922/C930e webcams was highly successful and now reworked cameras are being used in variety of applications like conferencing, self driving cars, insect motion analysis, traffic/free parking space analysis and many more. I don’t have plans to stop making them so there will be a choice between cheaper and high performance cameras.

Logitech Brio was released to offer 4K resolution, more vibrant colors and frame rates up to 90fps. And with replaceable lenses you can achieve amazing results. Even universal zoom lens will provide stunning results! And the best thing is these kits are already available on e-store!

Disassemble camera and salvage necessary parts

Reworking camera is simpler than C920 (less screws, simpler construction). Just some basic electronics skills are required to un-solder few parts. Detailed rework steps are described below.

Remove articulating mount. Just pull it ant mount will separate.

Remove glued plastic front plate. Use small screwdriver, tweezers or other sharp object to pry inside and peel it off.

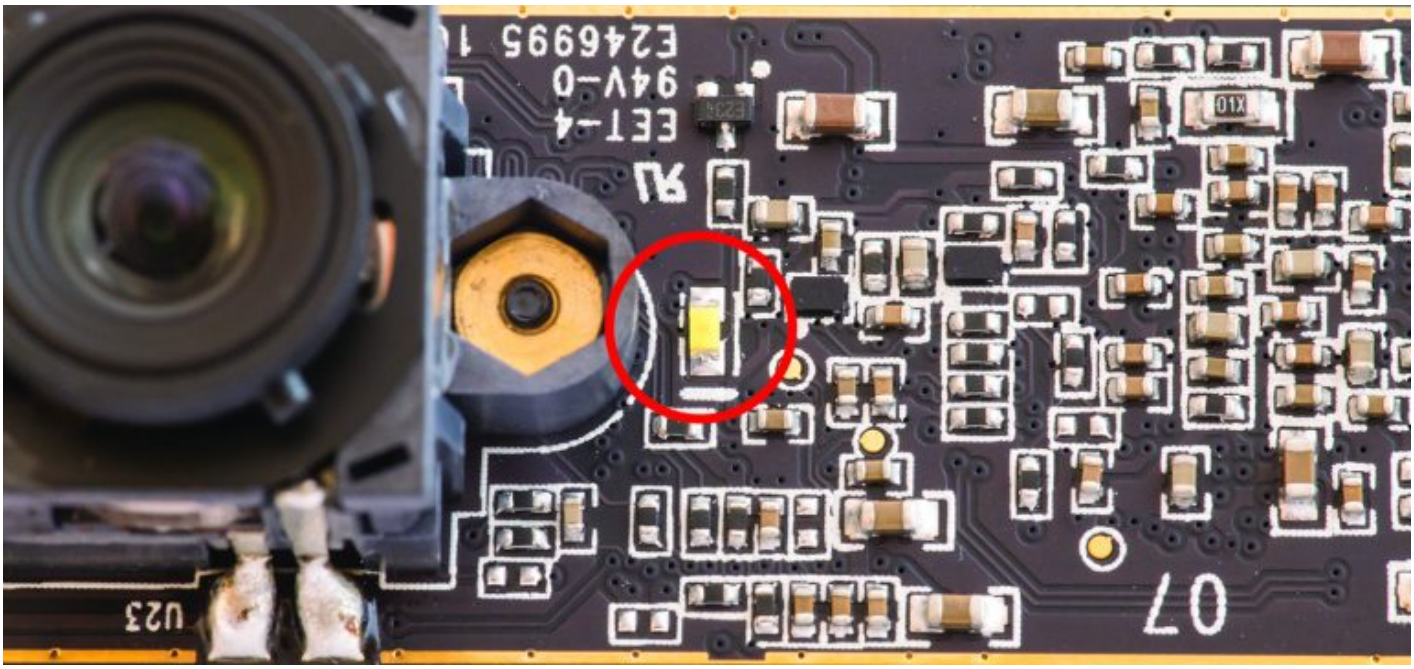
Disconnect cables (microphones, LED, Flat Flex Cable for IR camera). If you plan to use remove microphones and put them aside. Can be removed by gently pulling them out.

Mount plate is attached to enclosure with double sided adhesive tape. Pry small screwdriver or other flat sharp tool to separate them. Wiggle to remove and be gentle not to damage PCB.

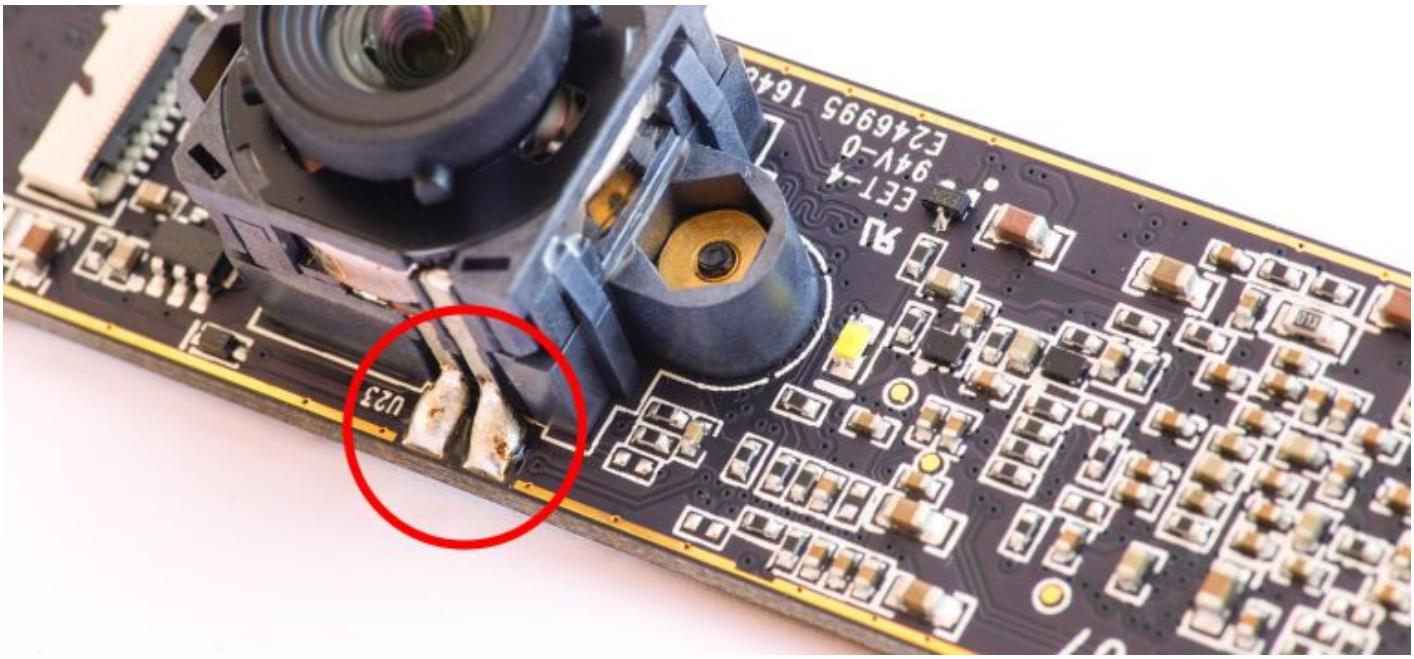
Camera PCB is held by four Philips screws. Undo them to separate board from enclosure.

Modify camera board

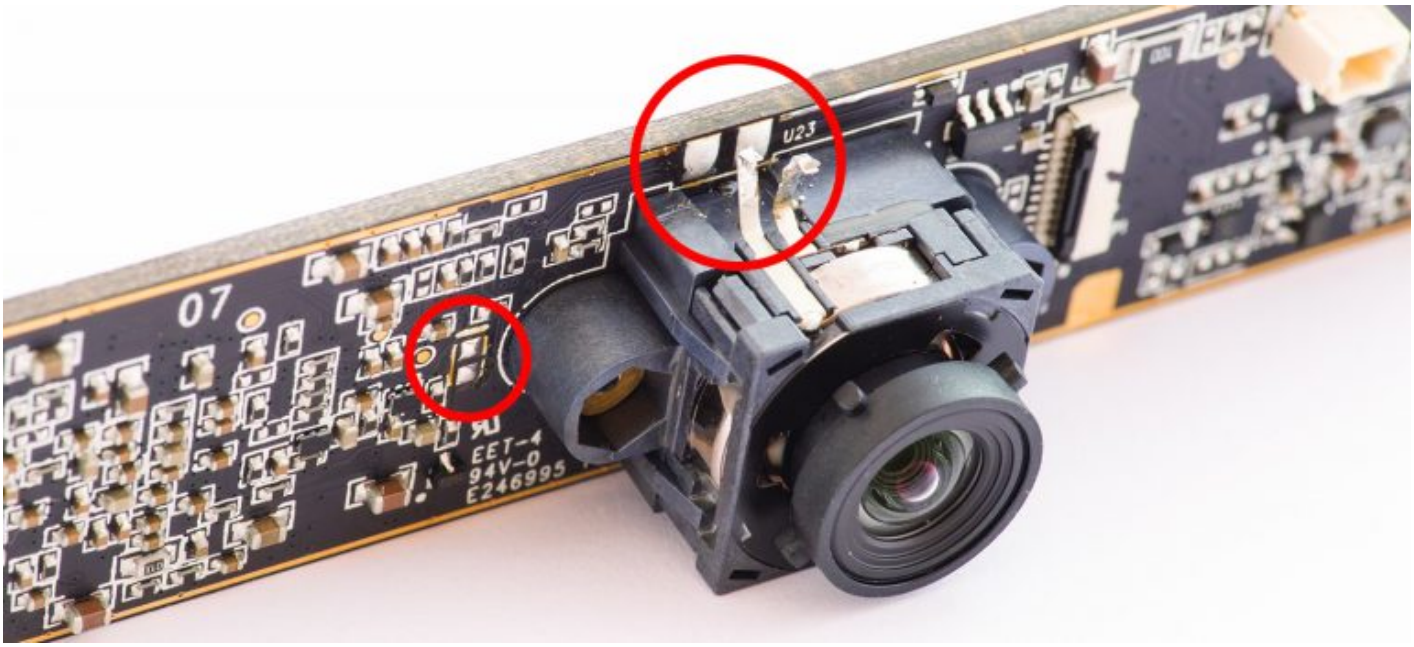
Camera has nasty white LED facing lens direction. If you don’t remove it LED will shine inside enclosure directly into sensor. Unsolder it.



Lens focusing coil is soldered to PCB. These pins also must be un-soldered.



After detaching these components PCB should look like this. It is the only soldering operation required.



Lens assembly is held together by two screws. This is last tear-down operation. Be careful not to leave your fingerprints on the sensor. If you don’t feel comfortable with bare sensor exposed to your workbench, leave it attached for now and remove right before screwing camera PCB into new enclosure.

Assemble new camera

Insert microphones into designated cutouts and secure them with screws. Remove lens assembly and connect cables to camera board.

Use included hex key to screw six DIN912 screws. Make sure microphone cables are not pressing against camera board or components. Use tweezers to manipulate them.

Now fasten remaining fasteners and you will have complete camera.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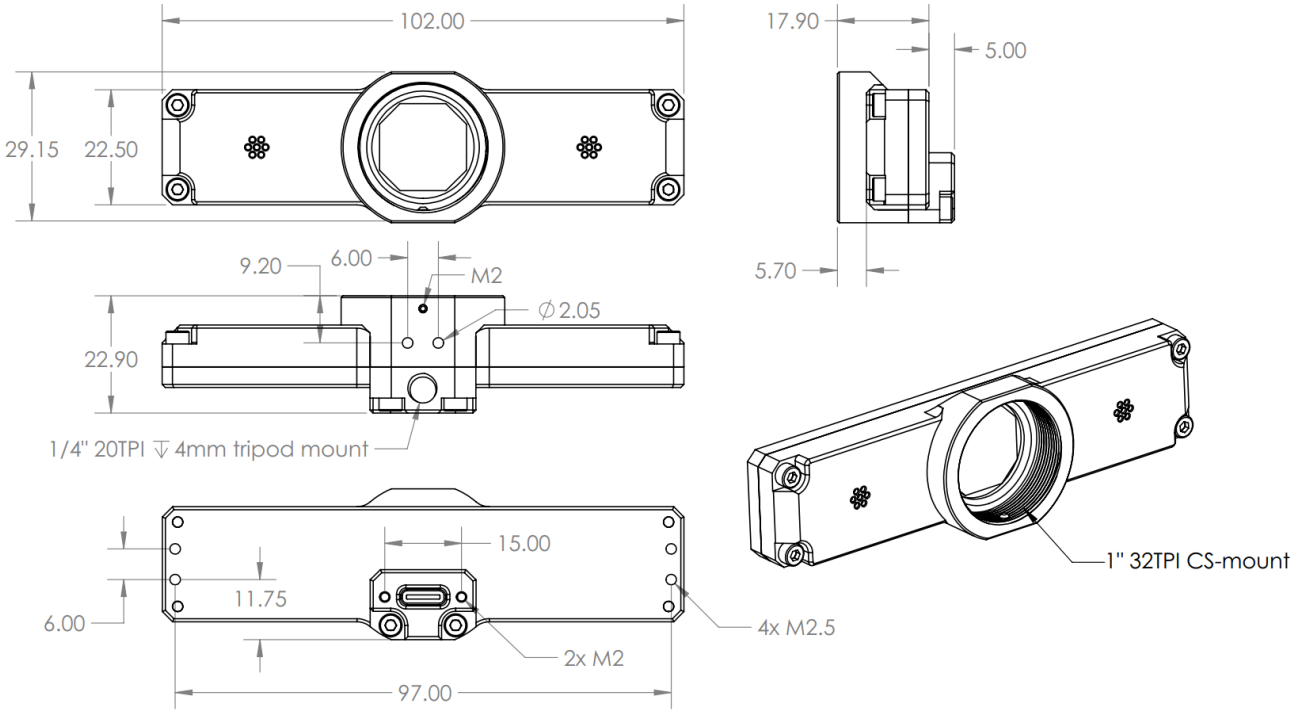
Dimensions and kit parts

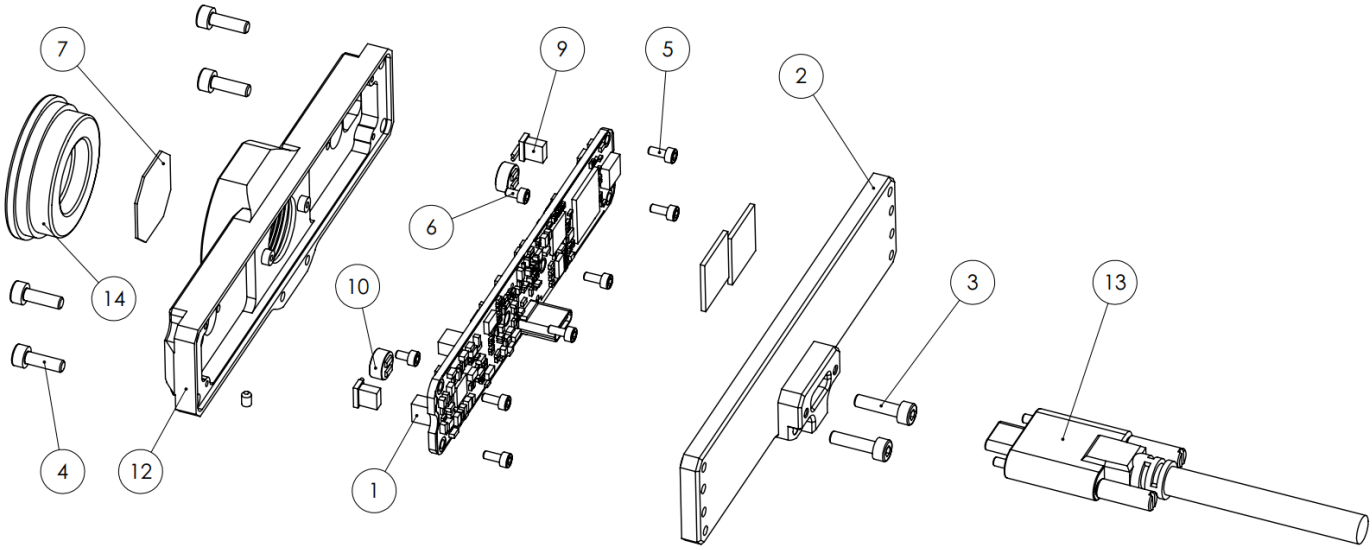
Detailed reworked Brio view



Weight

Full KIT weight (not including camera board): 45g

Exploded view



Part list

Item Nr	Part number	Qty	Notes
1	BRIO_PCBA	1	Extracted Brio PCB assembly
2	LP0534-P0003C	1	Back plate
3	DIN 912 M2.5 x 10	2	
4	DIN 912 M2.5 x 8	4	
5	DIN 912 M1.6 x 4	6	
6	DIN 912 M1.6 x 3	2	
7	FILTER	1	Optional optical filter
8	DIN 916 - M2 x 2	1	Optional lens retaining set screw
9			Brio microphone connector
10			Brio microphone
11			Brio silicone thermal pads
12	LP0534-P0005C	1	Front plate
13			Optional USB-C cable with lock screws

14	LP0262-P0008	1	Optional dust cap

Compare mk1 vs mk2

Changes for Brio rework kit were introduced at 2021-04-18. There were no major changes so initial design was replaced by mk2 version. All changes listed below:

Feature	mk1	mk2
Connectivity	USB-C	USB-C lock screws
Body features		Larger pockets for microphone wires for easier assembly
Body features		Larger opening for a sensor - allows use of short back-focal lenses with M12 lens adapter
Body features		Chamfered edges on front panel - small cosmetic change and minor weight saving
Body features		0.7mm thicker front plate
Weight (aluminum parts only)	43.3g	41.7g

Final notes

Image sensor

Most likely Logitech Brio uses Sony IMX091PQ sensor. Pixel count, size and dimensions look right.

Pixel count	4208 x 3120	pixels
Megapixels	13	Mega pixels
Active area size	• Horizontal = 4.69 • Vertical = 3.52 • Diagonal = 5.87	mm
Active area size	1/3.06	inch
Pixel size	1.12	µm, square

Dust

Dust is common thing and by exposing camera to uncontrolled environment expect some can settle on the sensor. If not during rework, dust can appear after some usage. Usually local photo equipment retailers have kits and tools to clean camera sensors.

Light filter

After completing rework, camera will be sensitive to full spectrum. Depending on your application feel free to leave it as is or use IR LOW PASS filter for normal operation or IR HIGH pass filter to see infrared part of available light. Filter can be mounted with few strips of double sided tape.

Filter installation is same as for C920 camera

Lenses

> Stock Brio lens focal length is **2.78mm**

Camera has high resolution, with low quality lens you will get low quality picture. We offer only tested lenses.

More details and discussion

Original blog post with discussion