



Telemetry Balkan doo Beograd

ORA-3. Open Robotic Actuator

Assembly Manual

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v 1.0.0

Beograd, Serbia
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Telemetry Balkan doo Beograd



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Overview

This document contains the step-by-step guide on how to assemble the 3d printed robotic actuator ORA-3. It covers only the mechanical operation, electronic components soldering and programming are not covered here.


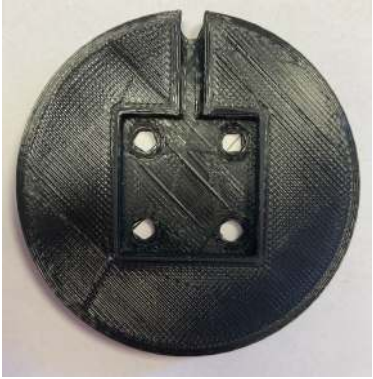
3D Printed Parts List

#	Part Name	Image	File Name	Quantity
1	ORA-3 Body		8_1_3.stl	1
2	ORA-3 Cover		8_2_4.stl	1
3	ORA-3 2:1 Gear		8_3_2.stl	1




4	ORA-3 Small Gear		8_4_1.stl	1
5	ORA-3 5:1 Gear		8_4_4.stl	1
6	ORA_3 Main Gear		8_6_5.stl	1
7	ORA-3 Main Shaft		8_7_2.stl	1



8	ORA-3 Flange		8_8_2.stl	1
9	ORA-3 AS5600 Holder		8_9_1.stl	1





Non-3D Printed Parts List

#	Part Name	Image	Quantity
1	6002 Bearing		1





2	6809 Bearing		1
3	MR83ZZ Bearing		4
4	M3x35 Screw		2
5	M4x20 Screw		8
6	M4x35 Screw		4




7	M3x8 Screw		8
8	M3 Washer		2
9	M4 Split Washer		12
10	M3 Split Washer		4

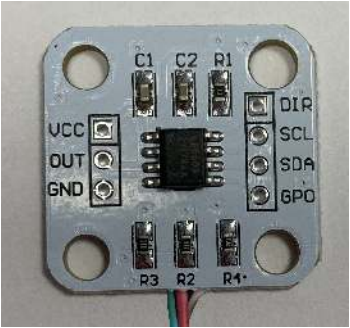


11	M3 Nut		4
12	M4 Threaded Rivet		20
13	Lithium Grease		

Electronics

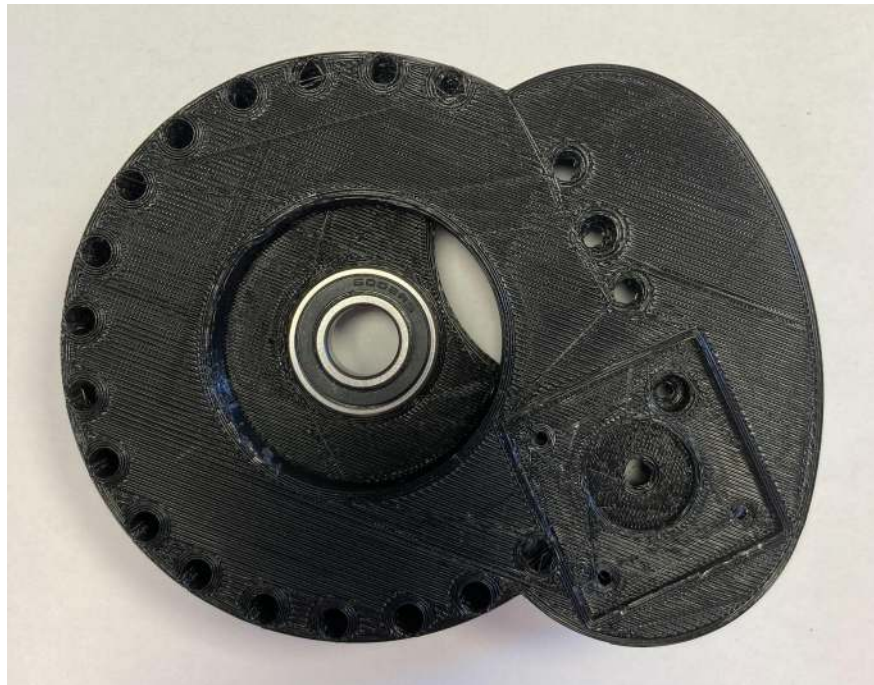
#	Part Name	Image	Quantity
1	Nema17 Stepper Motor		1



2	AS5600 Absolute Position encoder		1
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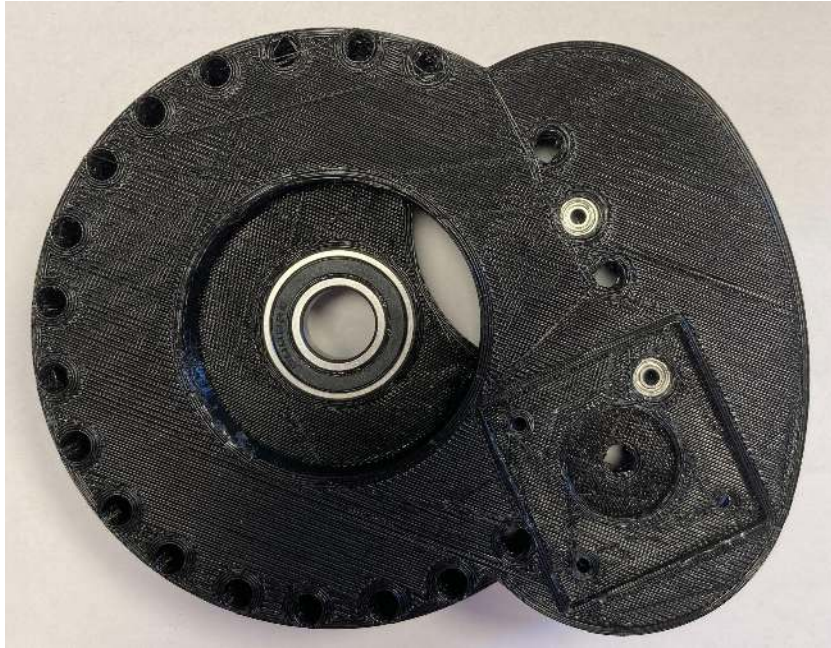
Assembly Guide

1. Push 6002 Bearing into the ORA-3 Body





2. Push 2xMR83ZZ Bearings into the ORA-3 Body

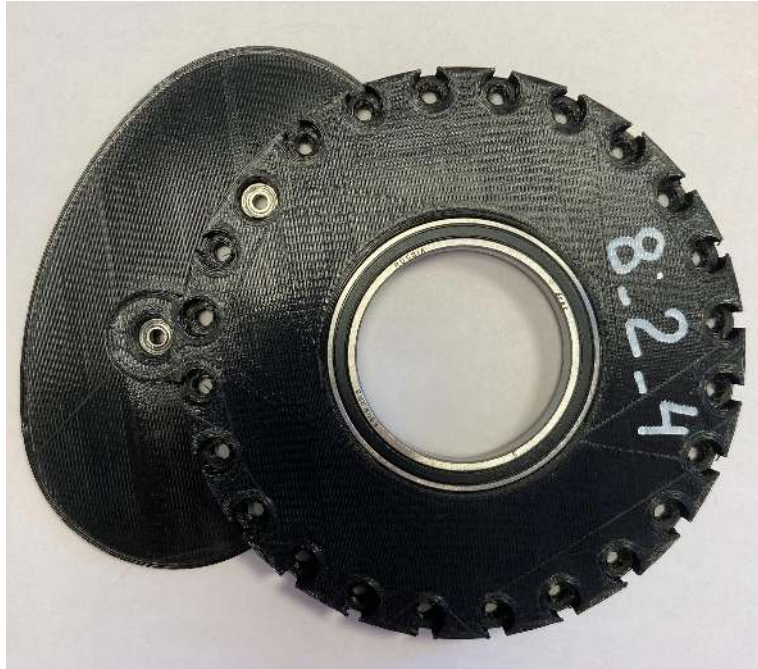


3. Push 6809 Bearing into the ORA-3 Cover





4. Push 2xMR83ZZ Bearings into the ORA-3 Cover

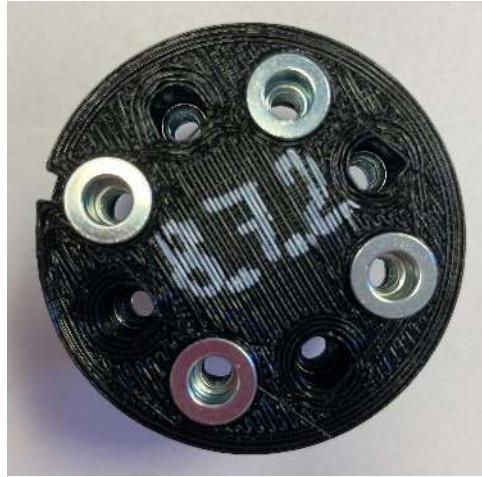


5. Insert 4xM4 threaded rivets into the front side of the Main Shaft

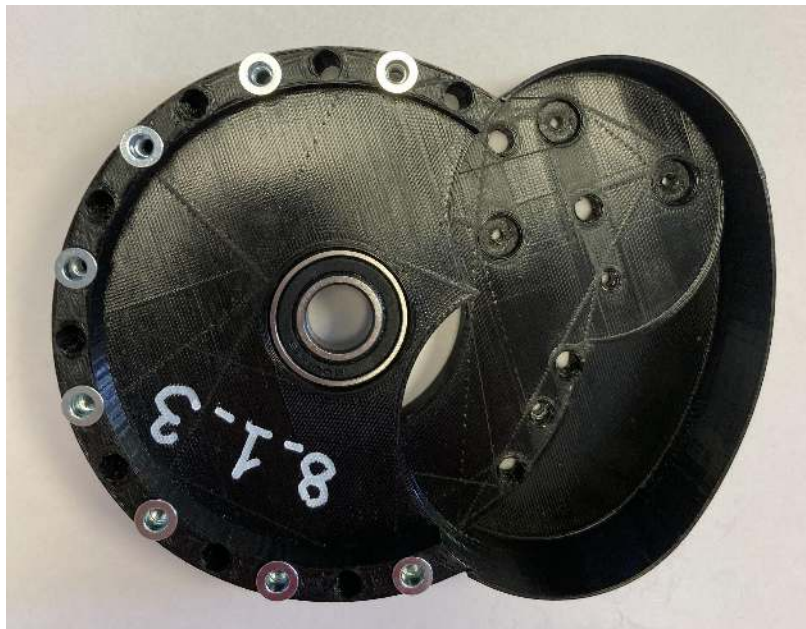




6. Insert 4xM4 threaded rivets into the rear side of the Main Shaft

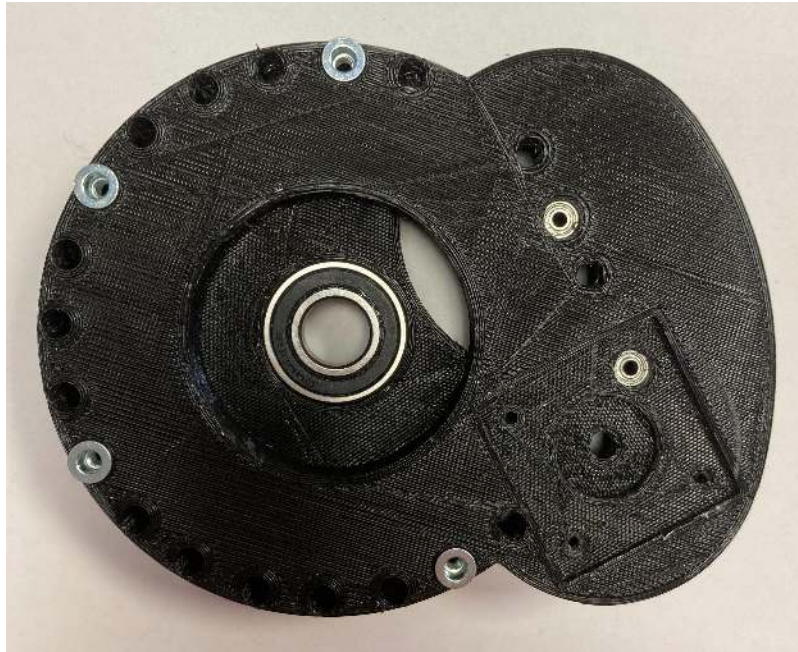


7. Insert 8xM4 threaded rivets into the front side of the ORA-3 Body



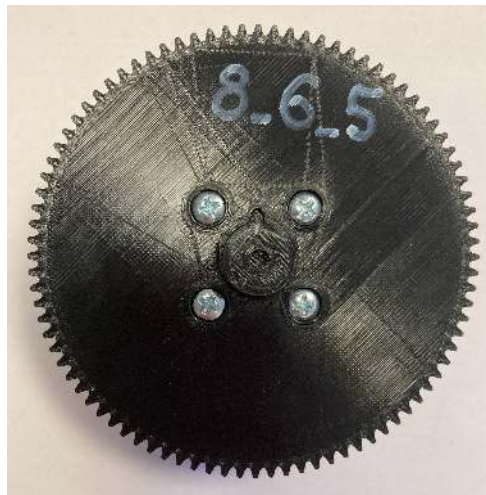


8. Insert 4xM4 threaded rivets into the rear side of the ORA-3 Body



9. Mount Main Gear on the Main Shaft

Use 4xM4x20 Screws and 4xM4 Split Washers



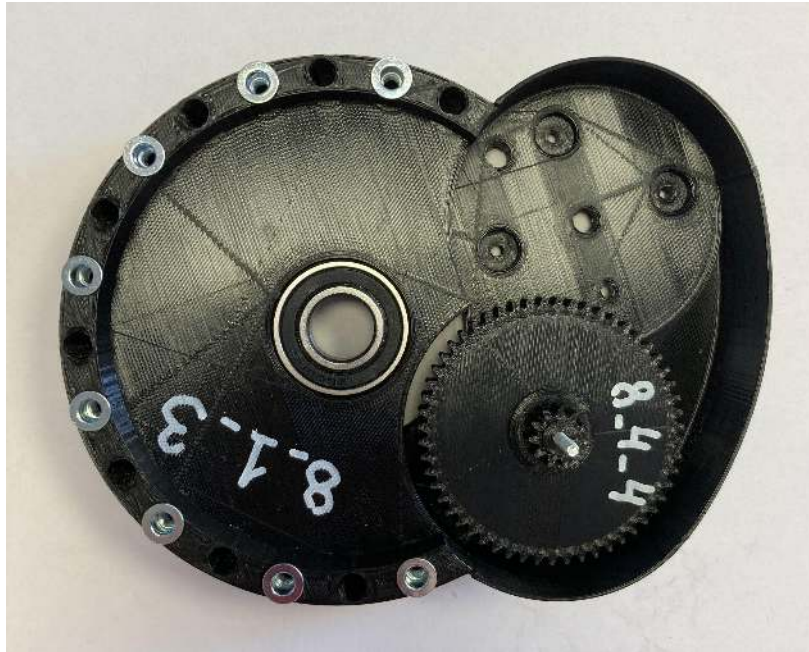


10. Push the Encoder Magnet into the Main Shaft



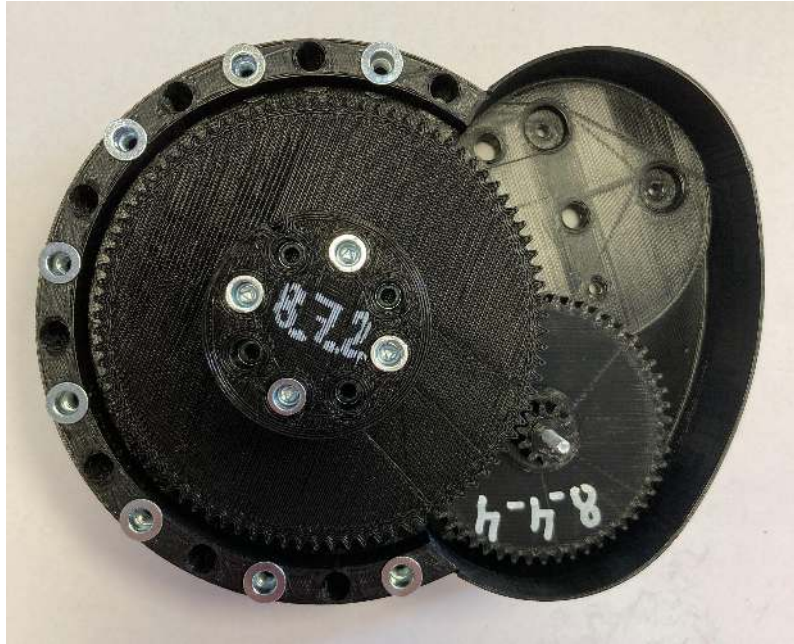
11. Mount 5:1 Gear into ORA-3 Body

Use M3x35 Screw as a shaft for 5:1 Gear



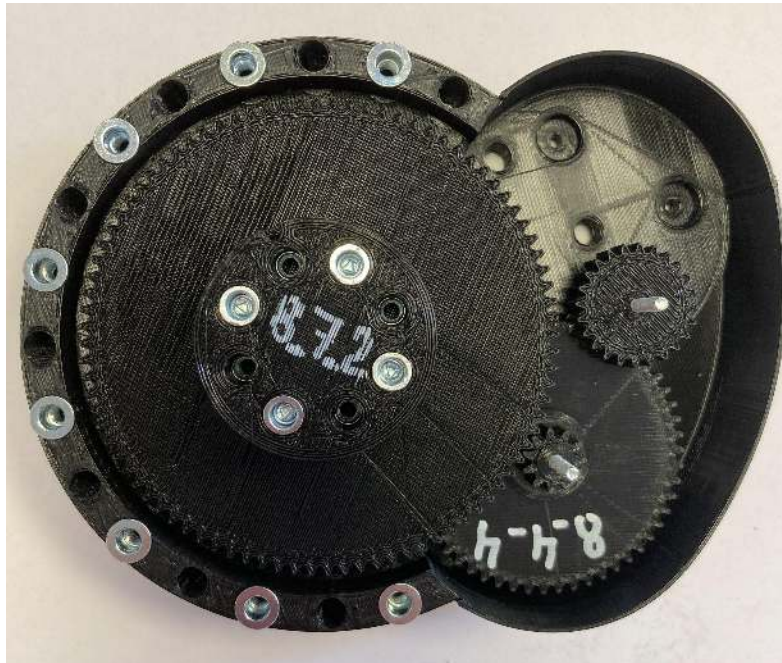


12. Mount Main Gear + Main Shaft into ORA-3 Body



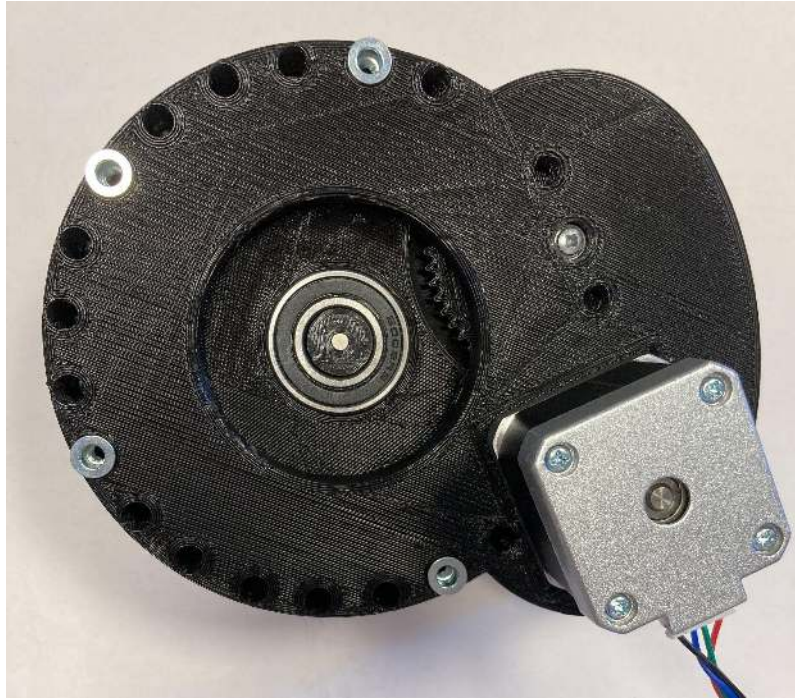
13. Mount 2:1 Gear into ORA-2 Body

Use M3x35 Screw as a shaft for 2:1 Gear

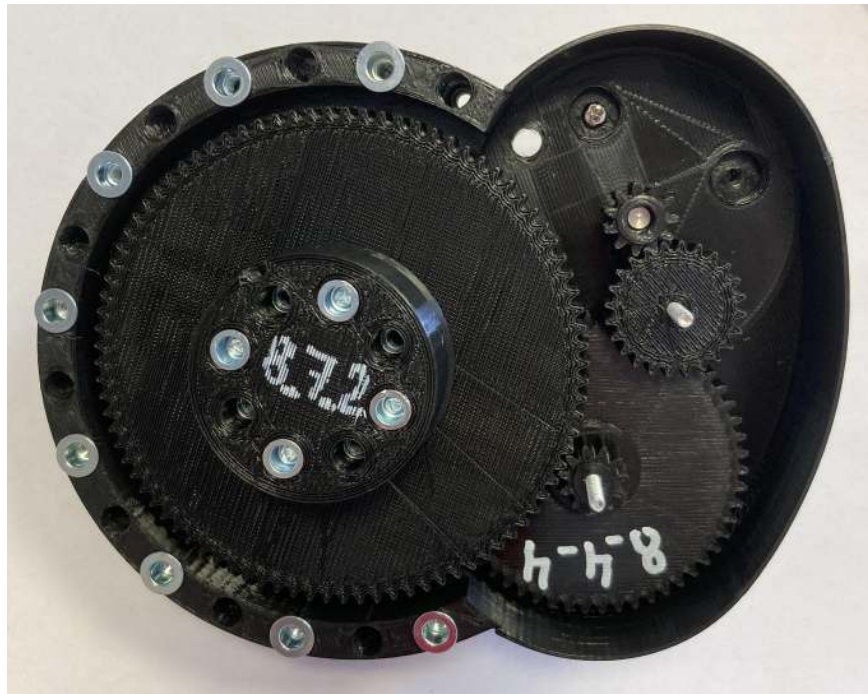




14. Mount Nema17 Motor with M3x8 screws



15. Mount Small Gear on Nema 17 Shaft

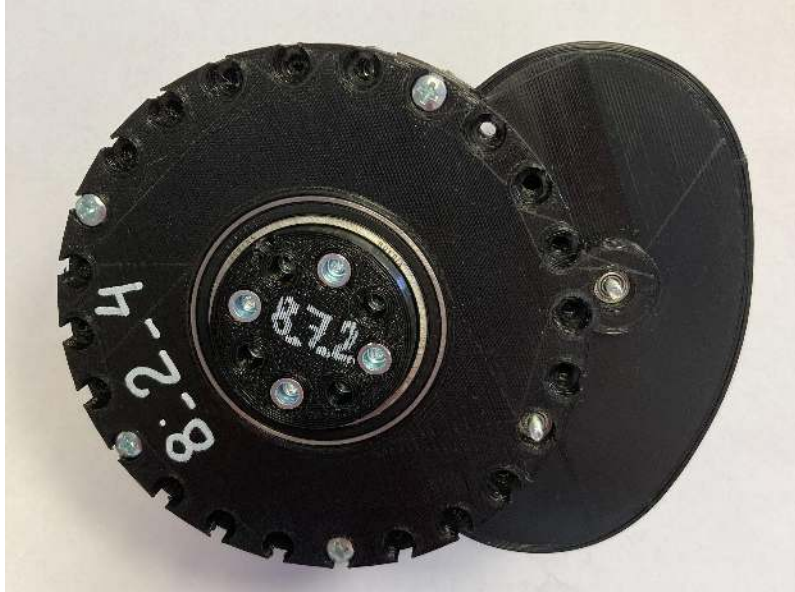




16. Apply Lithium Grease to all Gears

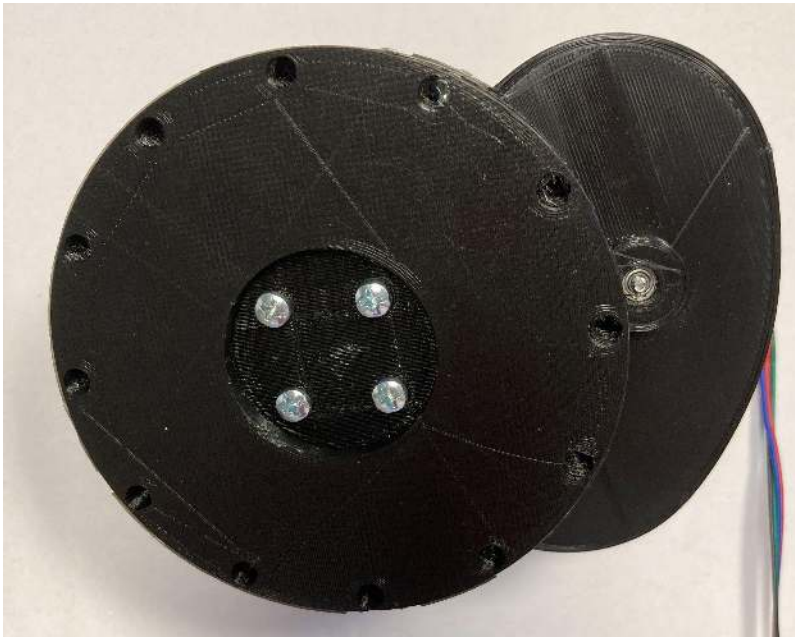
17. Mount ORA-3 Cover

Use 4xM4x35 Screws and 4xM4 Split Washers as shown on the picture.



18. Mount ORA-3 Flange

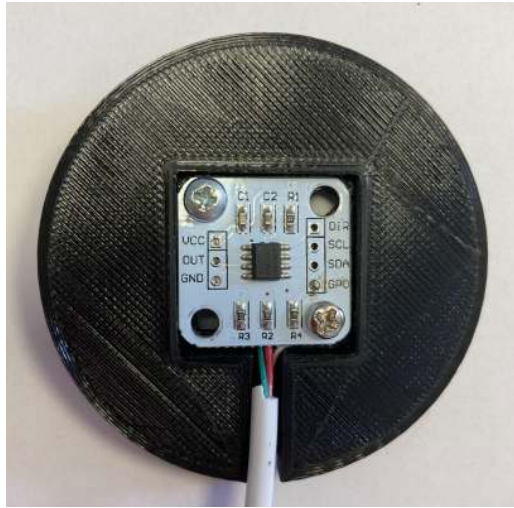
Use 4xM4x20 Screws and 4xM4 Split Washers as shown on the picture.



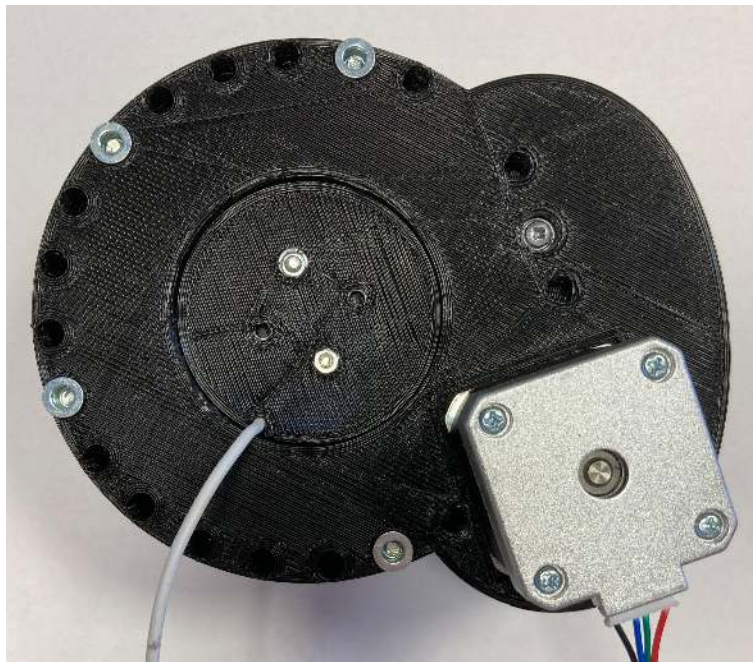


19. Mount AS5600 Encoder into the AS5600 Holder

Use 4xM3x8 screws and 4xM3 Split Washers



20. Mount AS5600 Holder into ORA-3 Body



What's next?

Check out for more DIY and OpenSource Hardware products on TelemetryBalkan doo Website:

<https://www.telemetrybalkan.com/>