



Telemetry Balkan doo Beograd

ORA-2. Open Robotic Actuator

Assembly Manual

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v 1.0.0

Beograd, Serbia
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Overview

This document contains the step-by-step guide on how to assemble the 3d printed robotic actuator ORA-2. It covers only the mechanical operation, electronic components soldering and programming are not covered here.

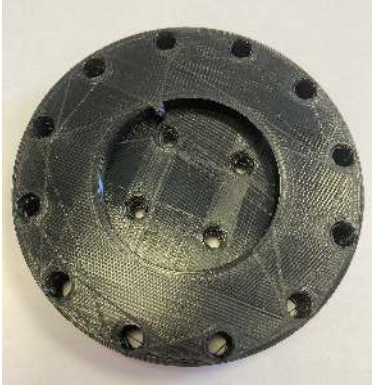
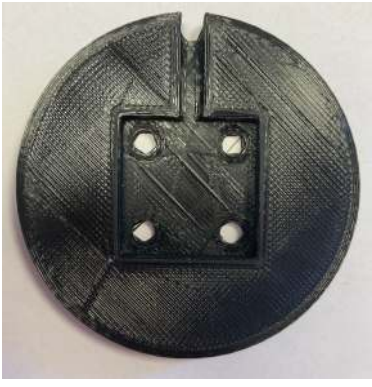
3D Printed Parts List

#	Part Name	Image	File Name	Quantity
1	ORA-2 Body		10_1_3.stl	1
2	ORA-2 Cover		10_2_2.stl	1
3	ORA-2 32:12 Gear		10_3_2.stl	1




4	ORA-2 Small Gear		10_4_1.stl	1
5	ORA-2 40:12 Gear		10_5_1.stl	1
6	ORA_2 Main Gear		10_6_2.stl	1
7	ORA-2 Main Shaft		10_7_2.stl	1



8	ORA-2 Flange		10_8_2.stl	1
9	ORA-2 AS5600 Holder		10_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




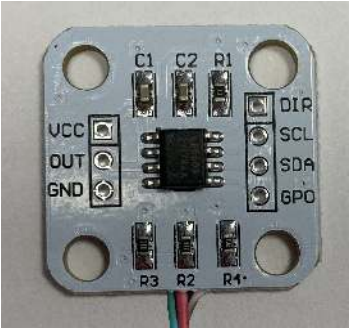
7	M3x8 Screw		8
8	M3 Washer		2
9	M4 Split Washer		12



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



Assembly Guide

1. Push 6002 Bearing into the ORA-2 Body



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





3. Push 6809 Bearing into the ORA-2 Cover



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

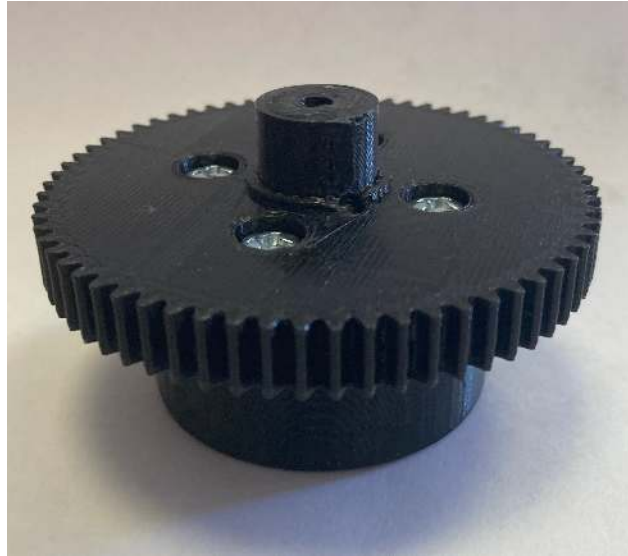


8. Insert 4xM4 threaded rivets into the rear side of the ORA-2 Body



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 44:12 Gear into ORA-2 Body

Use M3x35 Screw as a shaft for 44:12 Gear

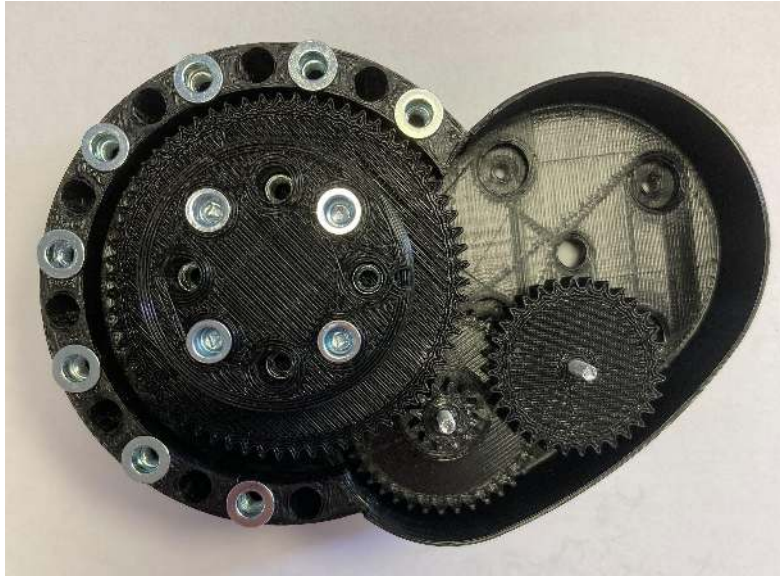


12. Mount Main Gear + Main Shaft into ORA-2 Body



13. Mount 32:12 Gear into ORA-2 Body

Use M3x35 Screw as a shaft for 32:12 Gear

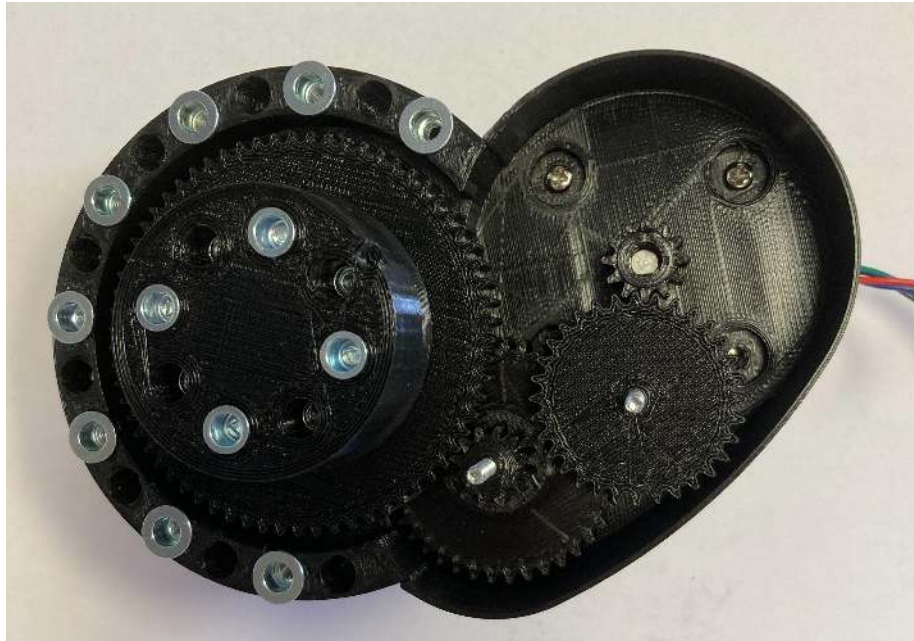


14. Mount Nema17 Motor with M3x8 screws





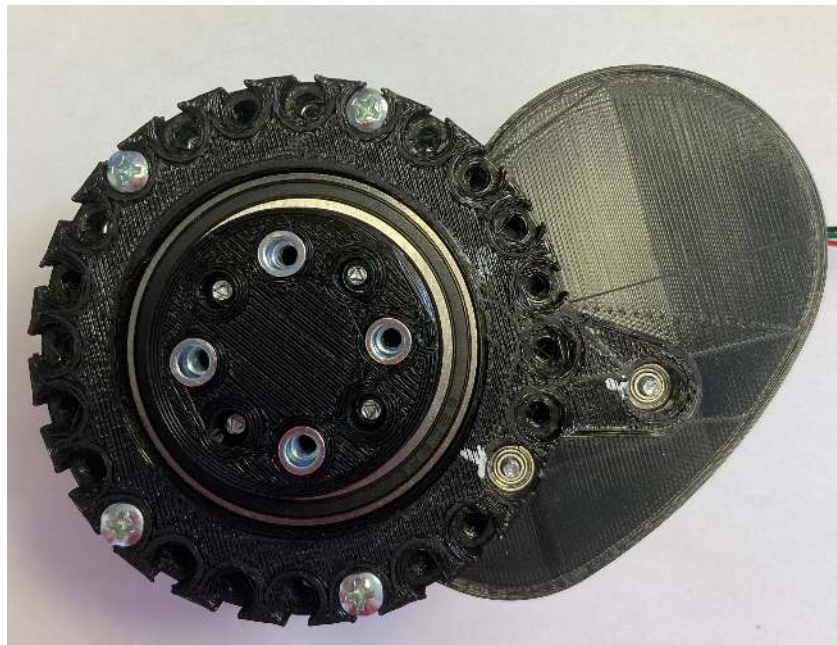
15. Mount Small Gear on Nema 17 Shaft



16. Apply Lithium Grease to all Gears

17. Mount ORA-2 Cover

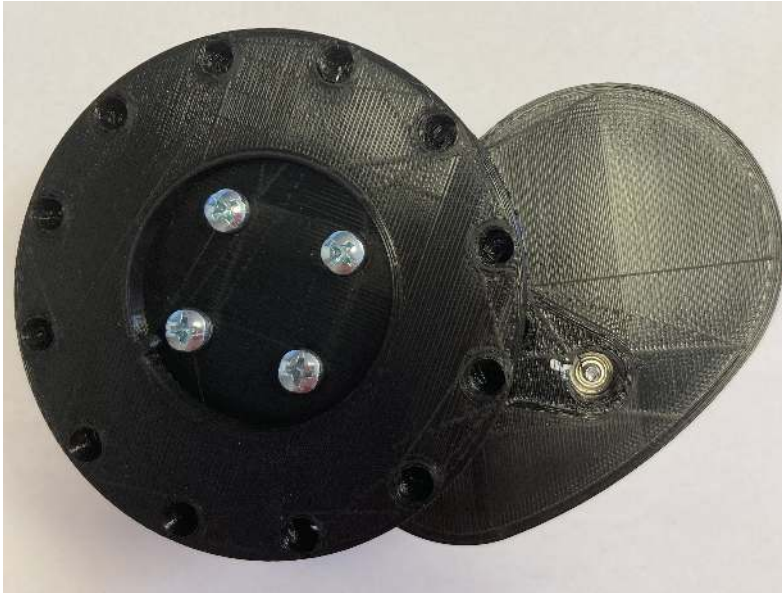
Use 4xM4x35 Screws and 4xM4 Split Washers as shown on the picture.





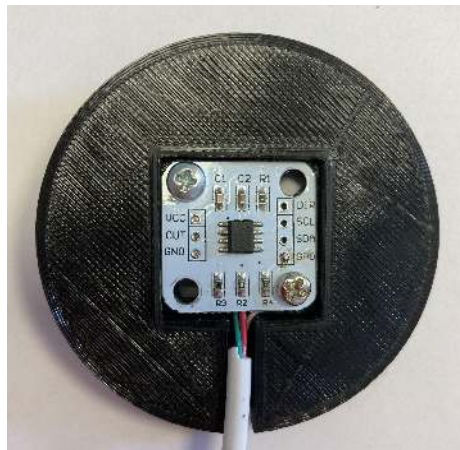
18. Mount ORA-2 Flange

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



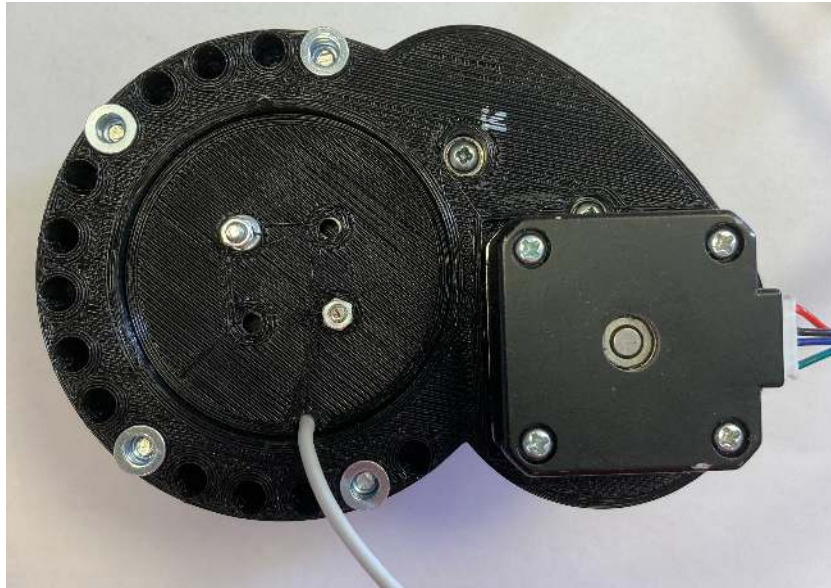
19. Mount AS5600 Encoder into the AS5600 Holder

Use 4xM3x8 screws and 4xM3 Split Washers





20. Mount AS5600 Holder into ORA-2 Body



What's next?

Check out for more DIY and OpenSource Hardware products on TelemetryBalkan doo Website:
<https://www.telemetrybalkan.com/>