Zortrax Robotic Arm

By Zortrax (/member/Zortrax/) in Workshop (/workshop/) > 3D Printing (/workshop/3d-printing/projects/) 41,065 180 25

Download Favorite

(/member/Zortrax/)
By **Zortrax (/member/Zortrax/)**
Zortrax Official ()

Follow

About: Zortrax S.A. is a manufacturer of integrated 3D printing environment: 3D printer, materials and software. Zortrax is providing its solution to SMB market and industries such as robotics, automation, architectu… More About Zortrax » (/member/Zortrax/)

Incorporating the 3D printer is vital, when we want to obtain high quality and functionality of a model fast and cost-effectively. Thanks to the strong and resistant materials from the Zortrax offer like Z-ULTRAT or Z-HIPS, creating models for testing and displays is entirely possible. Zortrax Robotic Arm is presented as an example how a highly functional prototype that can as well serve as an end use product, could be obtained with low expenses and labor. It is a matter to consider that before having a robot in our workplace, we could try having a desktop 3D printer.

Step 1: List of Materials

The example prepared by the Zortrax engineer shows, that the robot may be helpful in moving elements from one place to another thanks to the grasper mounted at the end of the arm. However, the area of development is really broad here as anyone can 3D print their own part according to the individual needs and tasks that are to be finished.

Below you will find a list materials required to assemble the Arm:

3D printed Parts:

Arm 1 gear.STL - quantity: 1
Arm 1 lower.STL - 1
Arm 1 upper.STL -1
Arm 2.STL - 1
Arm 3.STL - 1
Base gear.STL - 1
Base.STL - 1
Grasper 1.STL - 1
Grasper 2.STL - 1
Grasper Body.STL - 1
Grasper holder.STL - 1
Ring.STL - 1
Side cover arm L.STL - 1
Side cover arm R.STL - 1
Side cover base L.STL - 1
Side cover base R.STL - 1
Side lid arm L.STL - 1
Side lid arm R.STL - 1
Small gear.stl - 1
Support.STL - 1
Toothed ring.STL - 1
Vertical axis gear.STL - 1

Hardware: Part Quantity

Steel rod φ8 x 80 - 2
M3 x 12 SHCS screw - 14
M3 x 20 SHCS screw - 10
M3 nut - 8
Steel balls - 36
Spring 6x20 - 2
Bearing 608 - 1

Electronics:

Power supply - 1

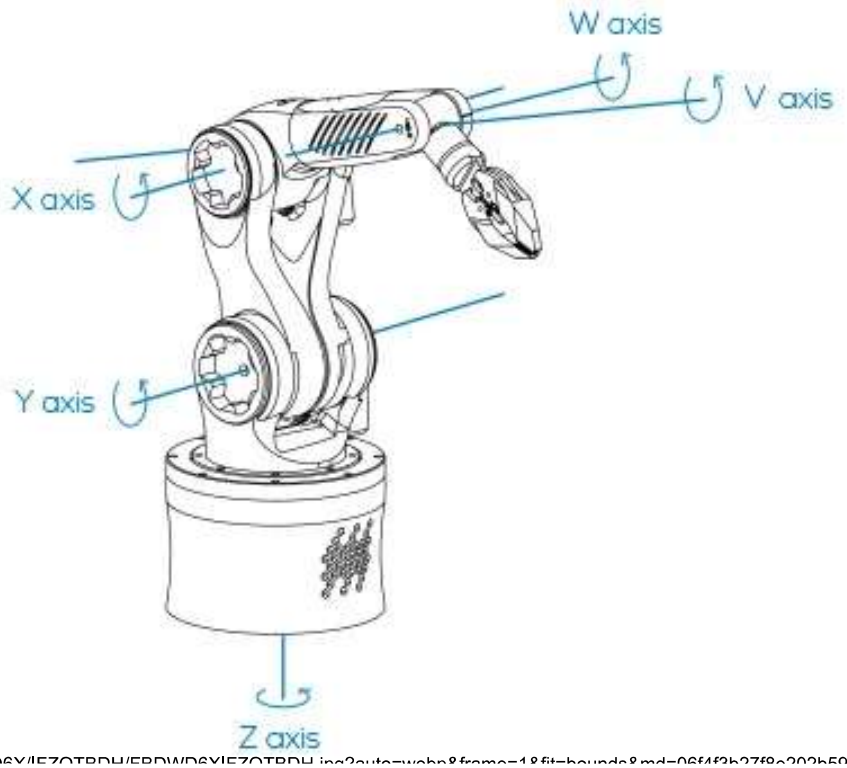
RAMPS 1.4 board - 1

Nema 17 Stepper Motors - 3

40x40 Fan - 2

Wires

Step 2: Robot Axes

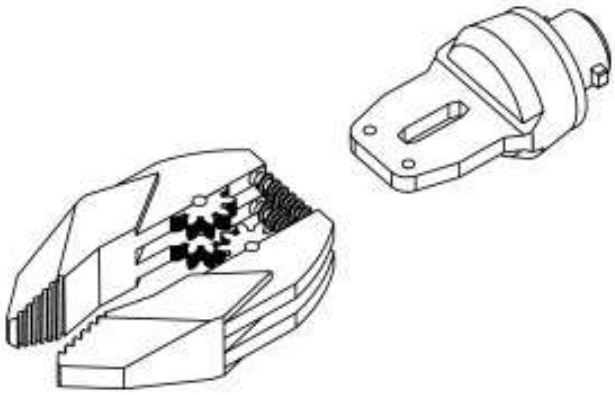


(https://content.instructables.com/FBD/WD6Y/IFZQTBDH/FBDWD6YIFZQTBDH.jpg?auto=webp&frame=1&fit=bounds&md=06f4f3b27f8e202b50fd445b5f0ebf51)

Movable axes: V, W, X, Y, Z

Electrically driven axes: X, Y, Z

Step 3: Gripper Assembly

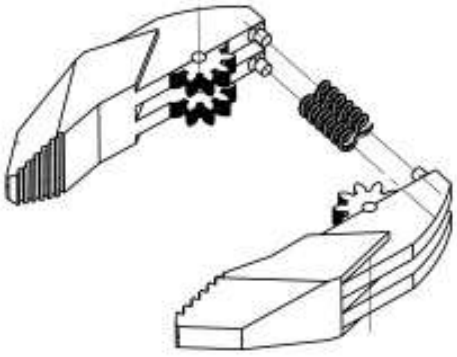


(https://content.instructables.com/F80/Q10F/IFZQTBDT/F80Q10FIFZQTBDT.jpg?auto=webp&frame=1&fit=bounds&md=2b8bb8ea1713744de2a6d12aae796b27)

Take two springs 6x20 and connect them to grasper 1 and grasper

Add Tip Ask Question Comment Download

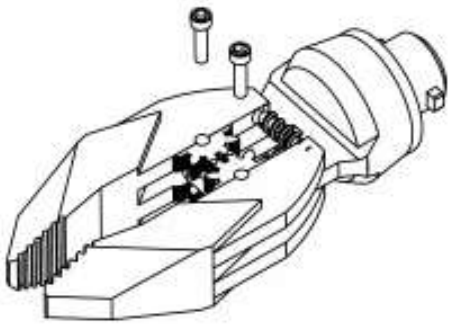
Step 4: Gripper Assembly



(https://content.instructables.com/FL5/P33M/IFZQTBDU/FL5P33MIFZQTBDU.jpg?auto=webp&frame=1&fit=bounds&md=a756a2a7460a7d1f70aa2367?dbeb4ea)

Put the assembly and the grasper body.

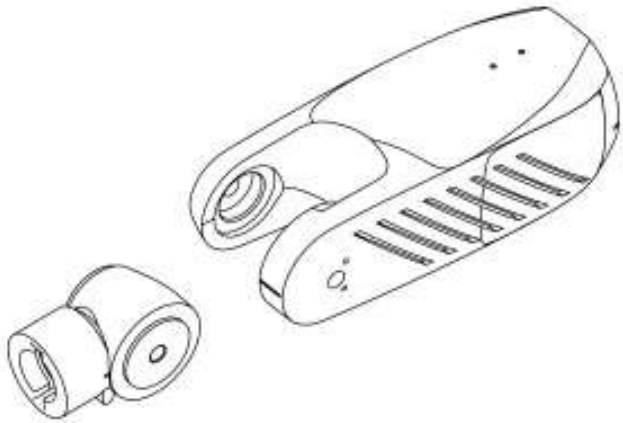
Step 5: Gripper Assembly



(https://content.instructables.com/FYF/7IS0/IF7QTBF2/FYF7IS0IF7QTBF2.jpg?auto=webp&frame=1&fit=bounds&md=28264f570cded7ee5de30b23233e24d0)

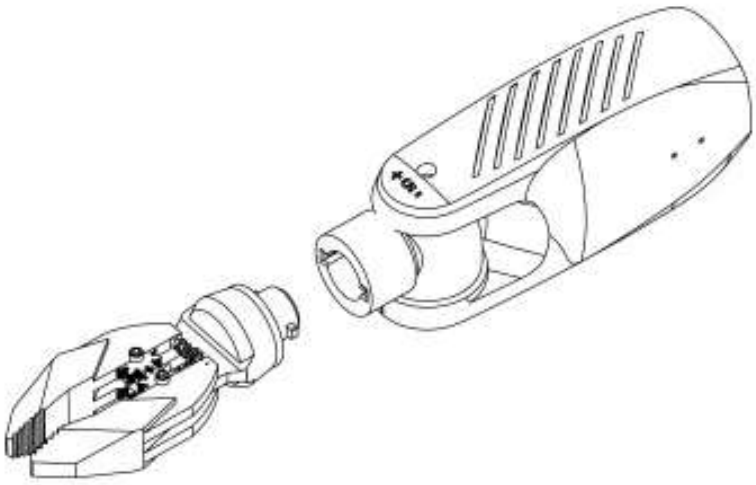
Insert two screws M3 x 20 SHCS into the grasper a and grasper 2.

Step 6: W Axis Assembly



Connect the grasper holder to arm 3.

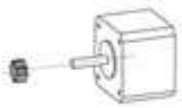
Step 7: V Axis Assembly

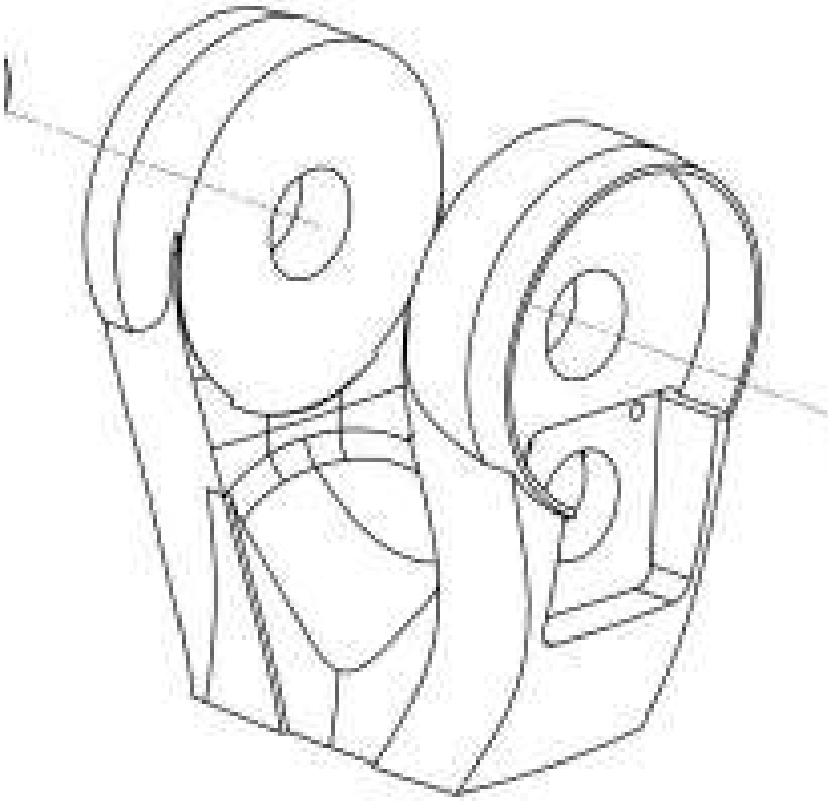


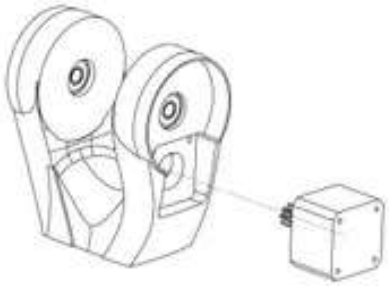
(https://content.instructables.com/FB2/YP9B/IE7QTBEQ/FB2YP9BIE7QTBEQ.jpg?auto=webp&frame=1&fit=bounds&md=191996e67583c4f25249fa87e37bb26b)

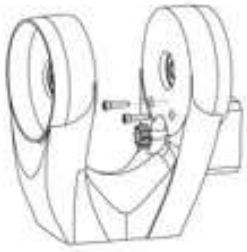
Insert the grasper assembly into the grasper holder.

Step 8: X Axis Assembly



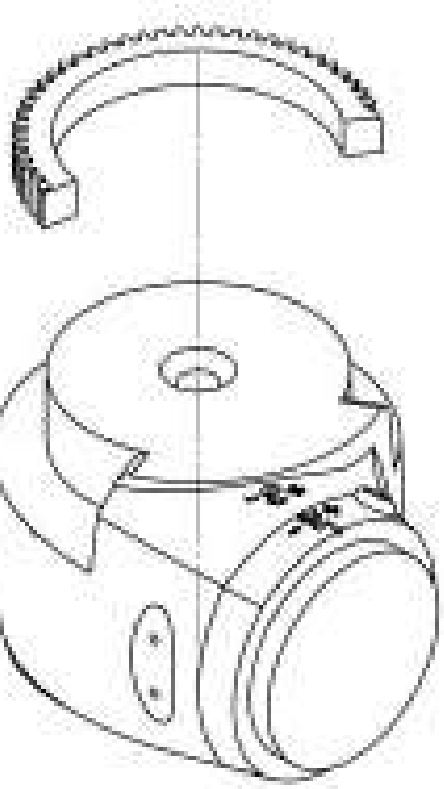


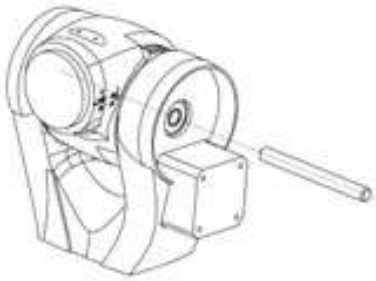


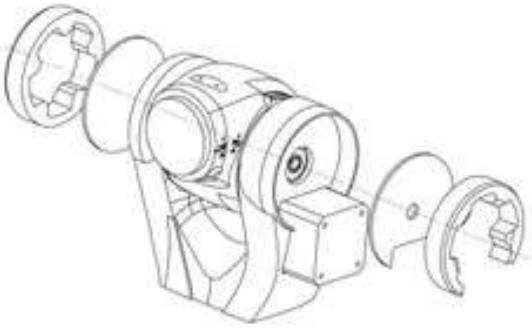


1. Insert two bearings 608 into the arm 1 upper.
2. Put the small gear on the motor.
3. Put the motor into the slot.
4. Take two screws M3 x 12 SCHS and insert them into the holes in the arm 1 upper.

Step 9: X Axis Assembly







5. Put the arm 1 gear on the arm 2 and connect them with glue.
6. Put together arm 2 and arm 1 upper.
7. Insert the steal rod φ8 x 80 into the bearings in arm 1 upper.
8. Take side lid arm L and side lid arm R and put it into the holes in arm 1 upper. Put arm civer L and arm cover into the holes in arm 1 upper.

Step 10: Y Axis Assembly

Zortrax Robotic Arm by Zortrax (/member/Zortrax/)

1. Connect base with toothed ring, then connect it with eight SHCS screws and eight M3 nuts. The ring should be placed between the base and the toothed ring.
2. Put the small gear on the motor shaft.
3. Insert the motor into the slot in base.
4. Insert two screws M3 x 12 SHCS into the holes in the base.

Add Tip Ask Question Comment Download

Step 11: Y Axis Assembly

2 More Images

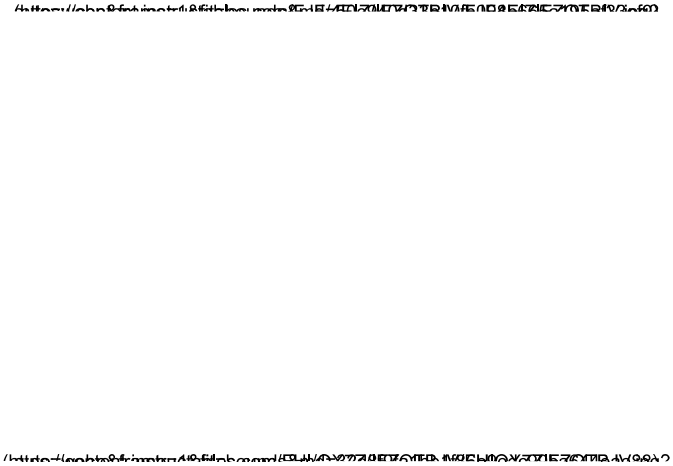
5. Insert two 608 bearings into the holes in the base.
6. Use glue to connect the base gear and the arm 1 lower.
7. Put the arm 1 lower on the base.
8. Insert the steel rod φ8 x 80 into the bearings in the base.
9. Connect side cover base L and R.

Step 12: Z Axis Assembly

Zortrax Robotic Arm by Zortrax (/member/Zortrax/)

1. Put the vertical axis gear on the motor.
2. Put the motor on the slot in support.
3. Secure motor with screw M3 x 12 SHCS.
4. Put 36 steel balls on the support track.

Step 13: Z Axis Assembly



1. Connect the Y axis assembly with the support using 8 screws M3 x 20 SHCS.
2. Connect X axis to Y axis assembly.
3. Connect V axis assembly to X axis assembly.

Step 14: Final Look

Step 15: Electronics Parts Needed

- 12V Power supply (100W or more)
- 1 x RAMPS 1.4 board with at least 3 Stepper motor controllers (steapsticks)
- 3xNema 17 Stepper Motors
- 1 or 2 12V 40x40mm fans
- Wires and USB cable (used for 2D printers)

Step 16: Installing Electronics

1. Mount all motors on the robotic arm.
2. Connect all the motors to the motherboard. Colors of motor wires can vary depending on a motor model.
- X motor means lower horizontal motor
- Y motor means upper horizontal motor
- Z motor means vertical motor
3. Place the motherboard in the compartment below the robotic arm.
4. Connect fan. You can connect 2 fans, just connect them in parallel. They need to fan on your electronics to prevent it from overheating.
5. Connect the power supply.

Step 17: Programming the Electronics

1. install Arduino Mega driver on your OS.
2. Upload firmware on RAMPS: Launch Arduino uploader and upload Marlin file from Marlin folder.
3. Download Pronterface - program for launching prints for 3D printers.
4. Launch Pronterface. Connect with your RAMPS.
5. Click Load File. Load Dancing robot .gcode (http://www.zortrax.com/downloads/Dancing_Robot.gcode)and click Print.

Zortrax Robotic Arm by Zortrax (/member/Zortrax/)

A Pocket Sundial From a Broken Pocket Watch! (/A-Pocket-Sundial-From-a-Broken-Pocket-Watch/) by JGJMatt

5 439

3D Printed Futuristic Space Age Wall Clock (/3D-Printed-Futuristic-Space-Age-Wall-Clock/) by kura_kura

42 1.8K

(/contest/gamedesign2023/) (/contest/makeitglow2023/)

Add Tip

Ask Question

Post Comment

We have a **be nice** policy.
Please be positive and constructive.

Add Images Post

25 Comments

(/member/appliedphysics0/) appliedphysics0 (/member/appliedphysics0/) 6 years ago

Reply Upvote

I've filled out the form to get the robot files several times and still have not heard back from zortrax. Where can I find the STL files for this project?

2 replies

(/member/lucasmenegatti52/) lucasmenegatti52 (/member/lucasmenegatti52/) 9 months ago

Reply Upvote

Im doing this for a hobby and a project for university

Im having trouble with the connections, can someone help me?
thanks

(/member/AdriPr/) AdriPr (/member/AdriPr/) 2 years ago

Reply Upvote

Hello,
thank you for sharing,
do you know what is the payload of this robot ?
Regards

3

(/member/hed420/) hed420 (/member/hed420/) 7 years ago

Reply Upvote

Are the W, V axis, and grasper not operational? After reviewing the .pdf file included with the .stl files it looks like you don't have control over these things. Looks like you can only move the x,y,and z axis since there's only 3 stepper motors.

1 reply

Zortrax Robotic Arm by Zortrax (/member/Zortrax/)

(/member/myrobokits/) myrobokits (/member/myrobokits/) 5 years ago

Reply Upvote

can any one help me
Please send me the 3d part on rohit.kr.sahu@gmail.com
thanks in advance

(/member/beyondal/) beyondal (/member/beyondal/) 7 years ago

Reply Upvote

Is there a way to downsize all the parts and still find fitting motors and other non printable items? What do I have to look at to make this possible.

(/member/landen58/) landen58 (/member/landen58/) 7 years ago

Reply Upvote

What Size are the steel balls? Also what resolution is required? If it requires high precision the prints are going to take forever

4 replies

(/member/musthy/) musthy (/member/musthy/) 7 years ago

Reply Upvote

Thanks.!

(/member/musthy/) musthy (/member/musthy/) 7 years ago

Reply Upvote

No Stl ? Could you update your intsructable.Thanks.

1 reply

(/member/ivano18/) ivano18 (/member/ivano18/) 7 years ago

Reply Upvote

No Stl ? Could you update your intsructable.Thanks.

1 reply

(/member/retrosaint/) retrosaint (/member/retrosaint/) 7 years ago

Reply Upvote

Hi All
I was able to get the 3D files from there website;
https://zortrax.com/free-robotic-arm-files/ (https://zortrax.com/free-robotic-arm-files/)
They send you a email once you complete the form, took about 5minutes before the email arrived in my inbox (also monitor your junk mail folder)
Hope this helps...

More Comments Post Comment

Find Us