

# Robot-Arm-Assembly-Kit

Robot 02



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Dear customer,  
thank you for purchasing our product. Please find our instructions below.

## 1. Introduction & technical specification

The robot arm, made of aluminum, is moved by 6, independently controllable, 20 kg motors. It is mounted on a beared rotary plate (360°).

The base-plate is made from 4.5mm thick acrylic and equipped with mounting-holes for all popular single-board-computers and microcontrollers.

The robot-arm can be extended by optional available supplies.

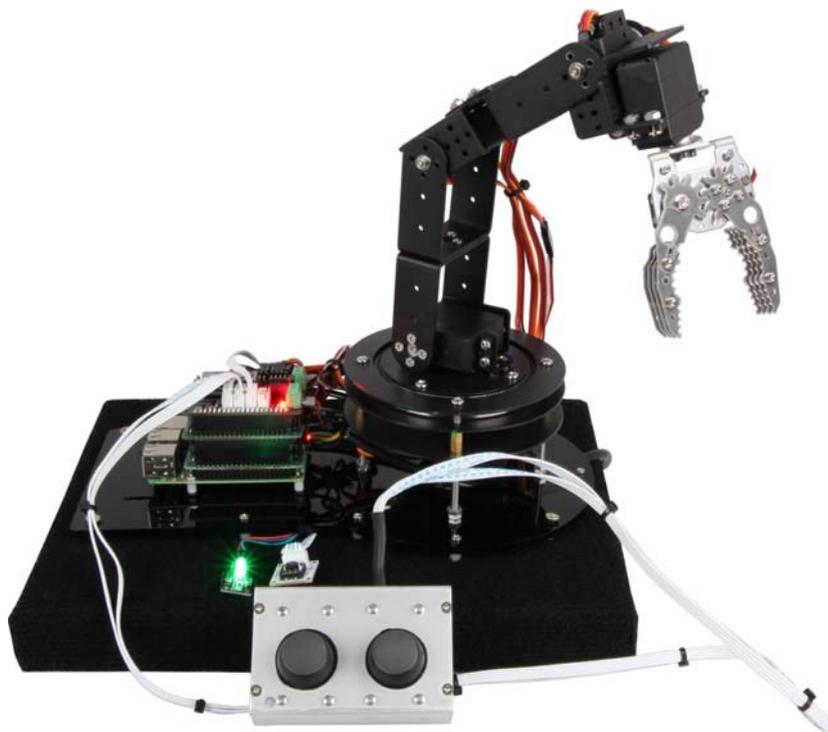


Image 1: Robot02 with optional accessories

<b>Model</b>	Robot02
<b>Motors</b>	21.5 kg/ cm torque at 7.4V 5V—7.4 V DC voltage 360° mechanical angle, 180° operating range metal gear controlable via PWM Current intake 5 mA to 2A (per motor)
<b>Frame</b>	Aluminumprofile
<b>Dimensions</b>	Base plate 28.5 x 16 cm Height: depending on the position of the arm, up to 42cm
<b>Range</b>	About 30cm from the center of the rotary plate
<b>Base plate</b>	4.5mm acrylic with mounting possiblity for Raspberry PI /A+/B+ /2 /3, Cubieboard, Arduino Mega, Banana PI /M2, pcDuino and many more. Holes with spacers allowing the attachment to a ground plate.
<b>Components</b>	Robot arm in single plarts incl. rotary-plate, claw, base-plate and mounting- material, 6 motors, german assembly instruction and manual
<b>EAN</b>	4250236815374
<b>Recommended Accessories</b>	Moto PI (Motor-control for Raspberry PI) Motorino (Motor-control for Arduino microcontroller)

## 2. Security informations



Dear customer, please note our following safety informations for protection against electric shock and injuries.

- Keep the manual and safety instructions! You need to hand these out when contracting the device out to another person.
- Use this device only for the intended use and only appropriate to the manual. Accord to the manual during the mounting.  
Only in this case it is ensured that the device is working properly. Read the manual completely and carefully before you start the assembling process.
- The robot-arm always needs to be placed on a stable and safe ground. Avoid the use of loose and shaky ground! We recommend to mount the baseplate (e.g. a table). For that, the baseplate is provided with holes with which the plate can be screwed to the base ground.
- Before using the device, make sure that the supply voltage matches the declared voltage. You must not vary from the declared voltage under any circumstances.
- Never touch the power plug with moist hands.
- All cables to the microcontroller and to the robot-arm needs to be undamaged.  
If damaged, you need to immediately replace the correlating cable.
- While working on the robot-arm, the power supply needs to be turned off and secured against repowering (e.g. by removing the power plug).
- Protect the device against moisture and rain. An usage in the rain, moist rooms or even under water must not approve under any circumstances.
- The consumption of alcohol, medication or drugs and sickness, fever and tiredness can impair your reaction and perception. You must not use the device in this case.
- This product is no toy and must not be used by children. Keep it away from them and store it at a place which is inaccessible for children.  
Protect the robot-arm against the use by unauthorized persons.
- Avoid that the motors come to a charged deadlock.
- Do not keep your hands, or other objects, in the operating-zone during the usage.
- **You must not under any circumstances move to or grab after humans or animals.  
Do not use the device close to animals!**
- Watch for exposed cables which could tangle up. Remove all cabled from the operating zone. When needed, mount exposed cables with cable-ties.

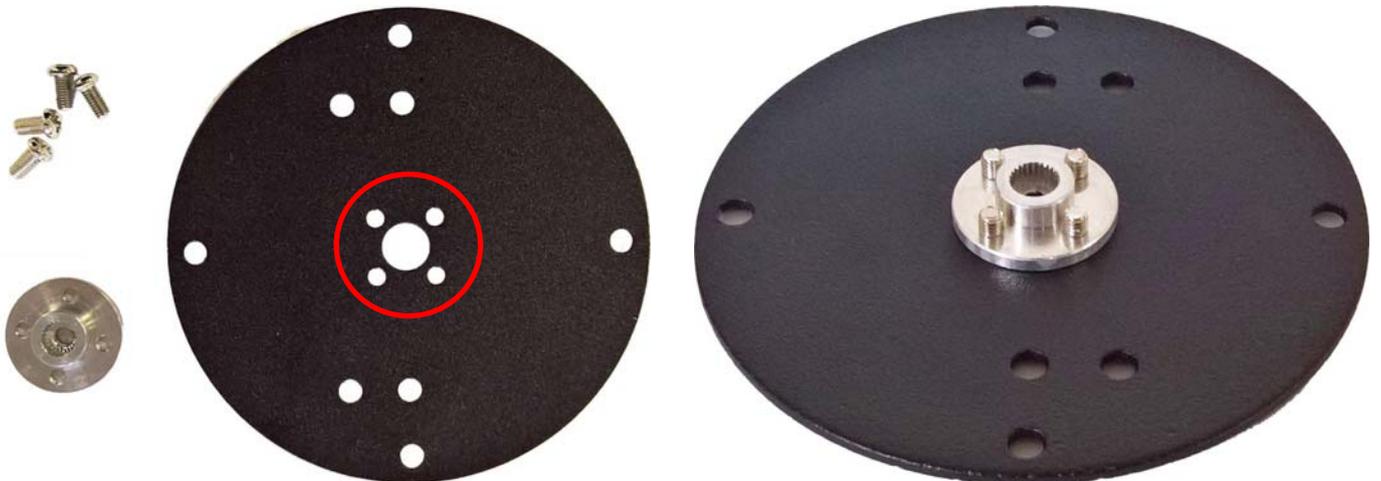
- The scope of delivery contains a lot of small screws, nuts and other small pieces. They can easily get lost and can be choked by kids and animals and lead to injuries or death. You also should not leave the wrapping material unattended.
- Only operate the robot-arm in its fully mounted condition. Any operation during the assembly process can lead to unexpected behaviour or even to injuries.
- Assemble the robot-arm only under your highest attention. Always watch your fingers.
- Wear gloves as the circumstances require to protect against possible bruises or cuts by components or tools.
- Because of the open construction of the device, sharp edges are unavoidable. Watch out for injury risks.
- Do not grasp into the engines.
- Because of the open construction of the device, uncovered parts and traces can appear. Accidentally discarded metal-parts can cause a short circuit.
- During the use of the robot-arm, vibrations can occur. Screws and nuts can come loose. These need to be retorqued regularly.
- The power supply needs to be equipped with an easily accessible switch which allows you to turn of the robot-arm in an emergency situation, without accesing the operating zone of the robot-arm.
- **While the power supply is active, a safe distance of 1 meter needs to be kept. Make sure that nobody comes below this distance. Depending on the programming, it can come unexpected movements. Persons and creatures which does not stick to this distance can suffer by bruises, excoriations and stitches. This especially applies for soft parts like eyes. There shouldn't be any objects in a distance below 1 meter. Objects in the range of the arm can be slinged away.**
- Every single motor needs a current of up to 2A. Take care of a powerful power supply. At the maximum charge of every motor, a current of 12A is needed. Power supplies of mobile phones are not suitable. Power supplies can heat during an overload which can damage the other devices.
- You become the manufacturer by applying changes to the arm or by adding components. You need to adopt measures so that nobody is getting harmed.

### 3. Mounting the robot arm

At first you need to remove the protective foil.

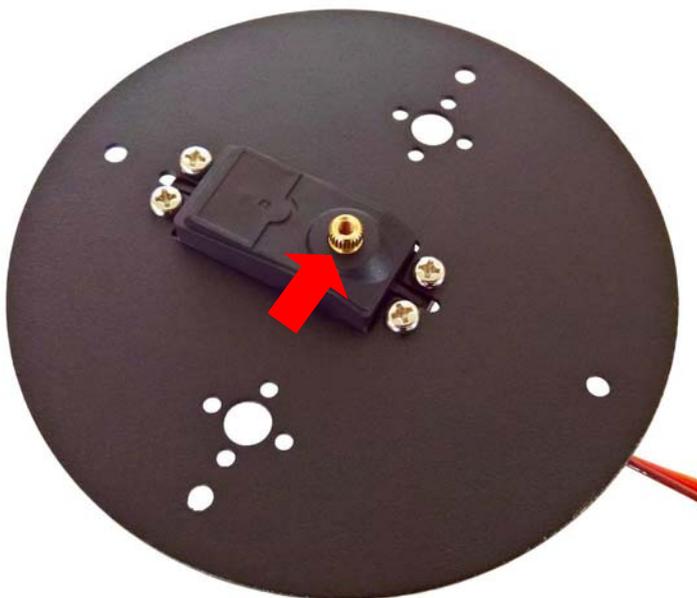


The round servo-lever is mounted with 4 screws to the round plate.



The servo is mounted to the round plate.

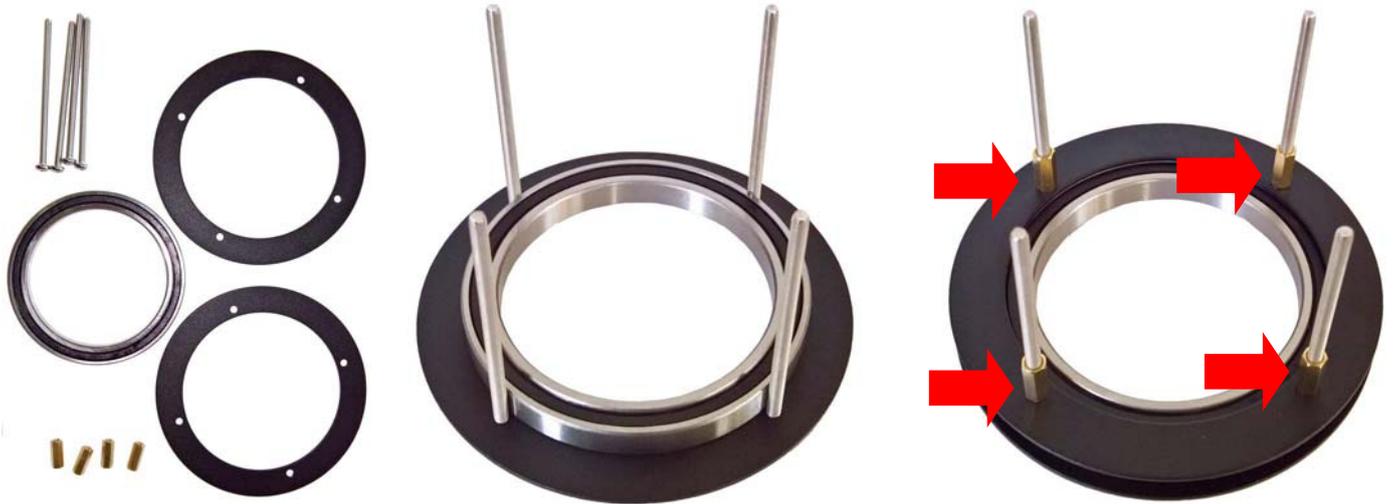
Therefore, the plate is placed in the servo and is getting mounted with 4 screws and nuts.



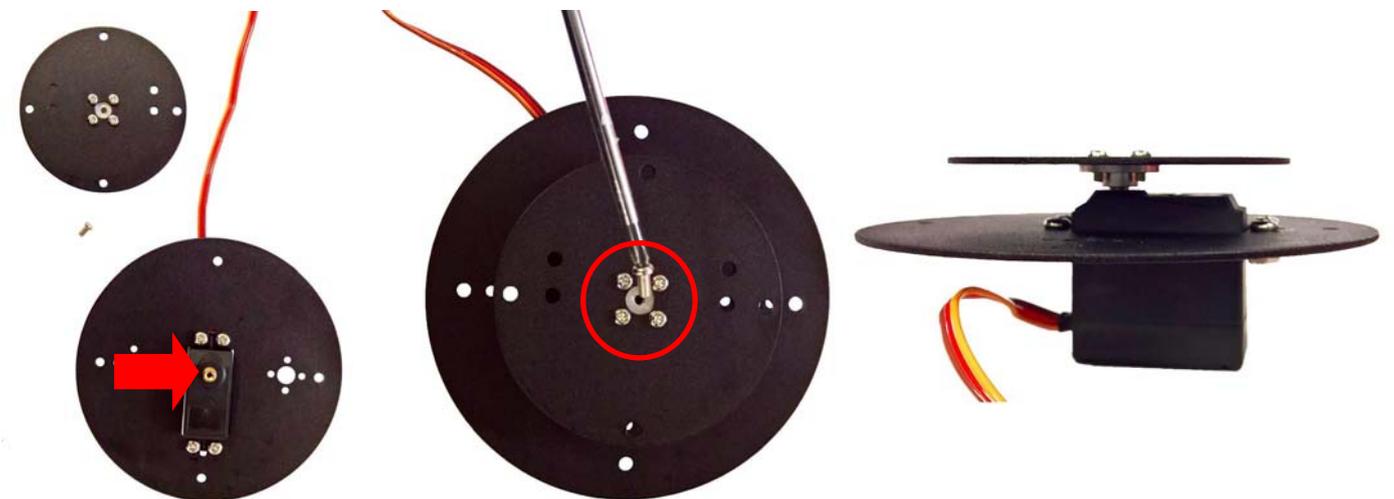
Watch carefully that the servo-gearwheel is exactly in the middle.

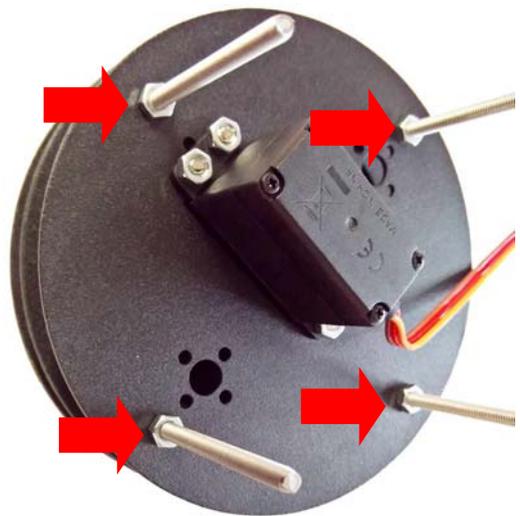
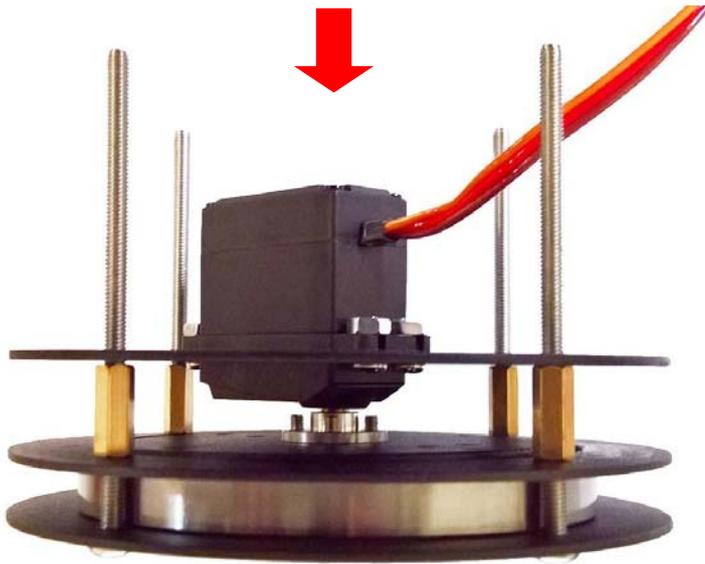
Next, the bearing holder is mounted.

Place the 4 long screws through the first ring. Then apply the bearing.  
 Now the second ring needs to be placed and screwed with the four long brass casings.



The round plate with the servo-holding is placed on the head of the servo and mounted with a screw in the middle.

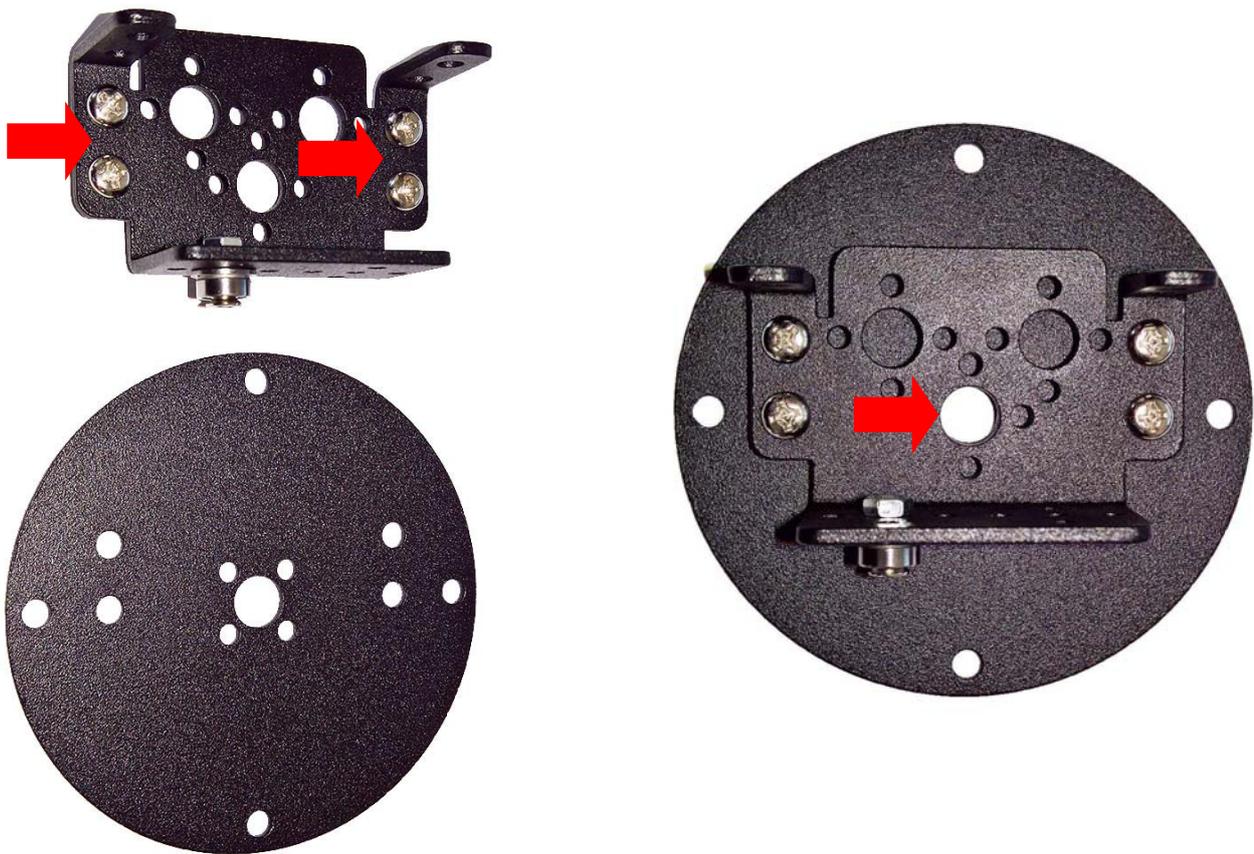




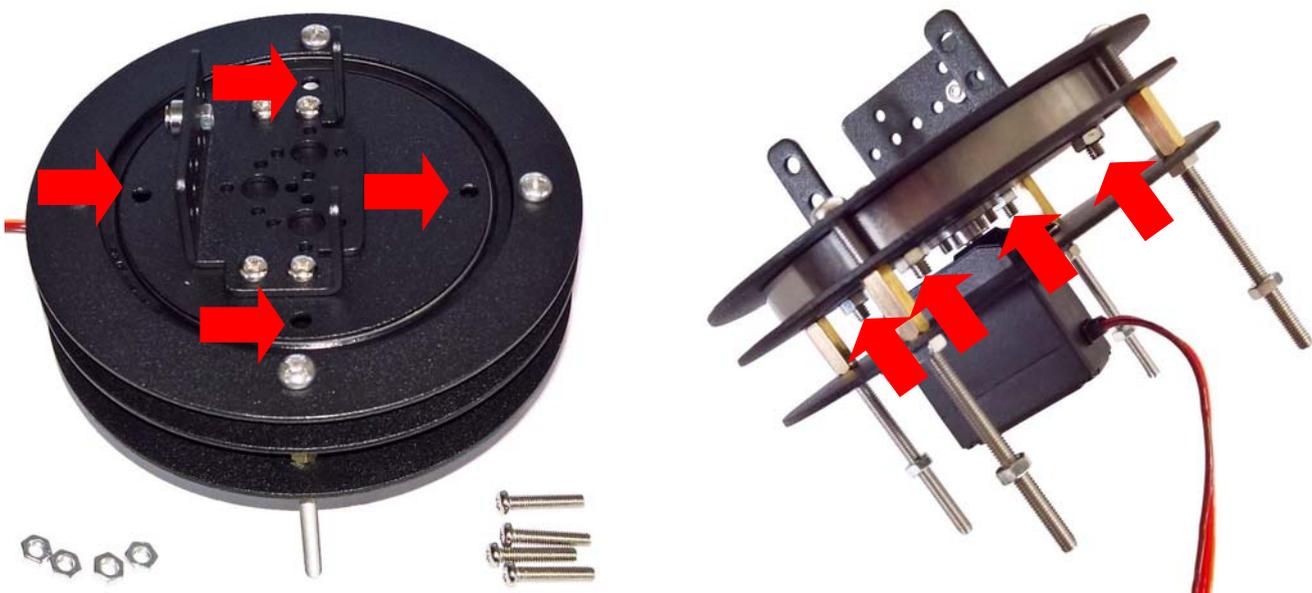
The plate with the servo is mounted on top of the bearing holder and screwed with 4 nuts.



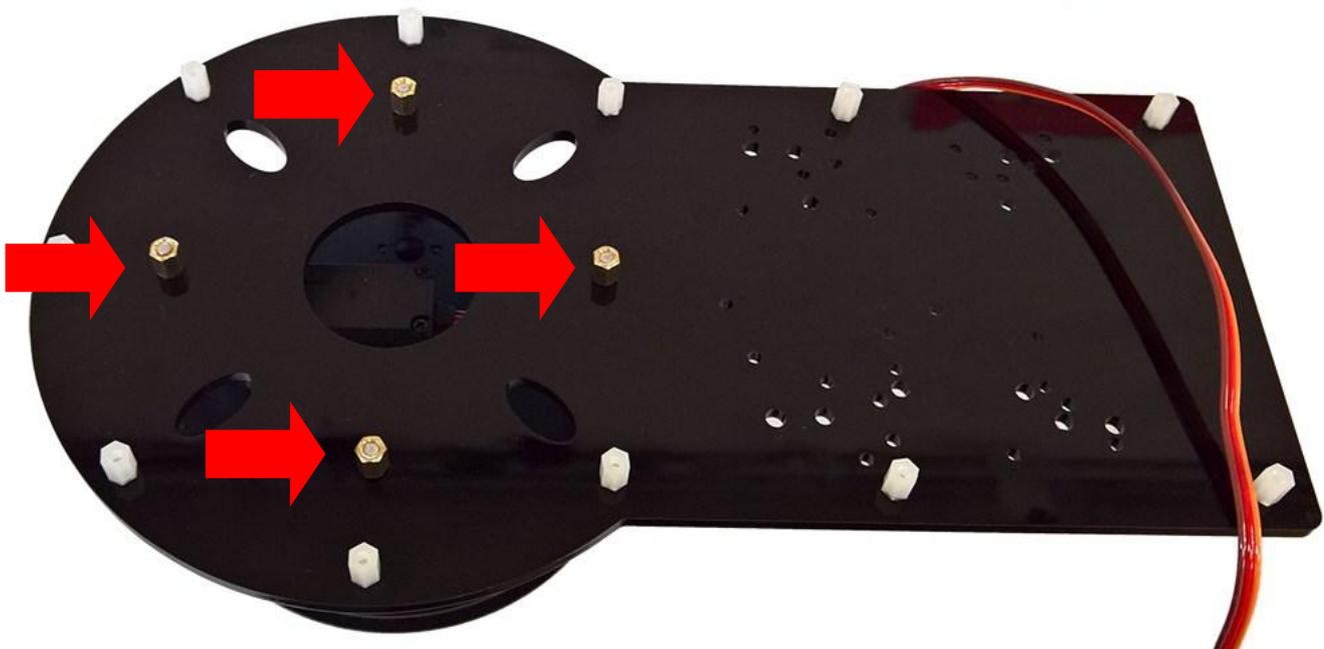
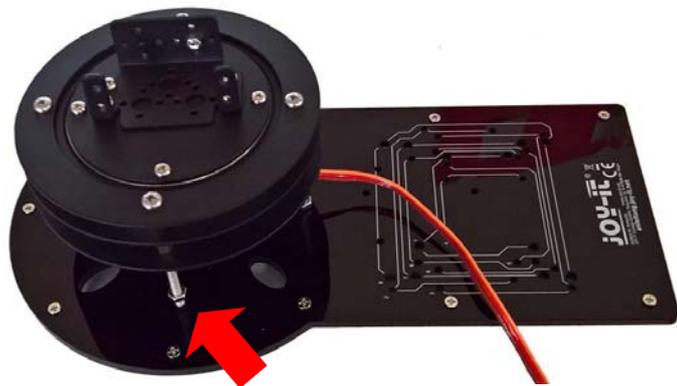
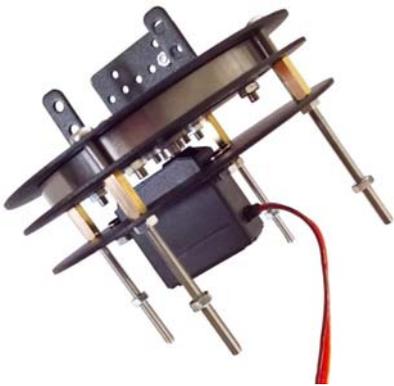
Mount a bearing to the first angle-plate.



Now screw the angle-plate to the round-plate.

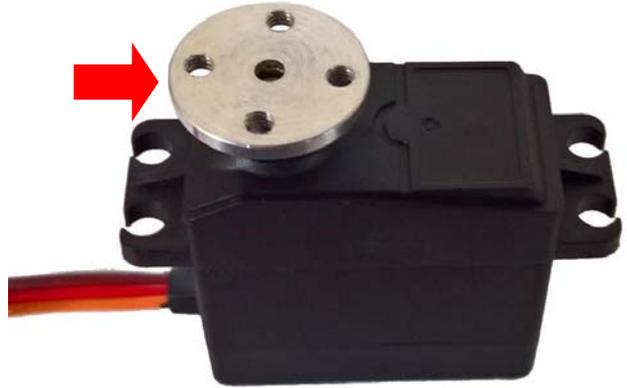
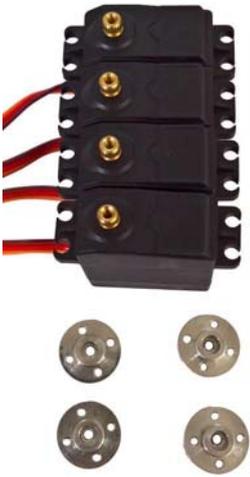


And mount int to the bearing.



You can now mount int to the base-plate and fix it with brass casings on the bottom.  
 Watch out that the threads does not look out of the casings.  
 Tighten the nuts on the upper side.  
 The plastic spacers can now be mounted to the bottom side.

Stick the servo-levers to the servos.



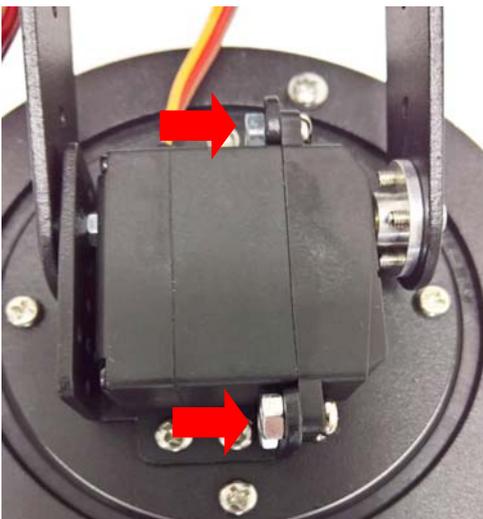
And fix the two U-plates with 4 screws and nuts.



Mount the arm to the bottom part.



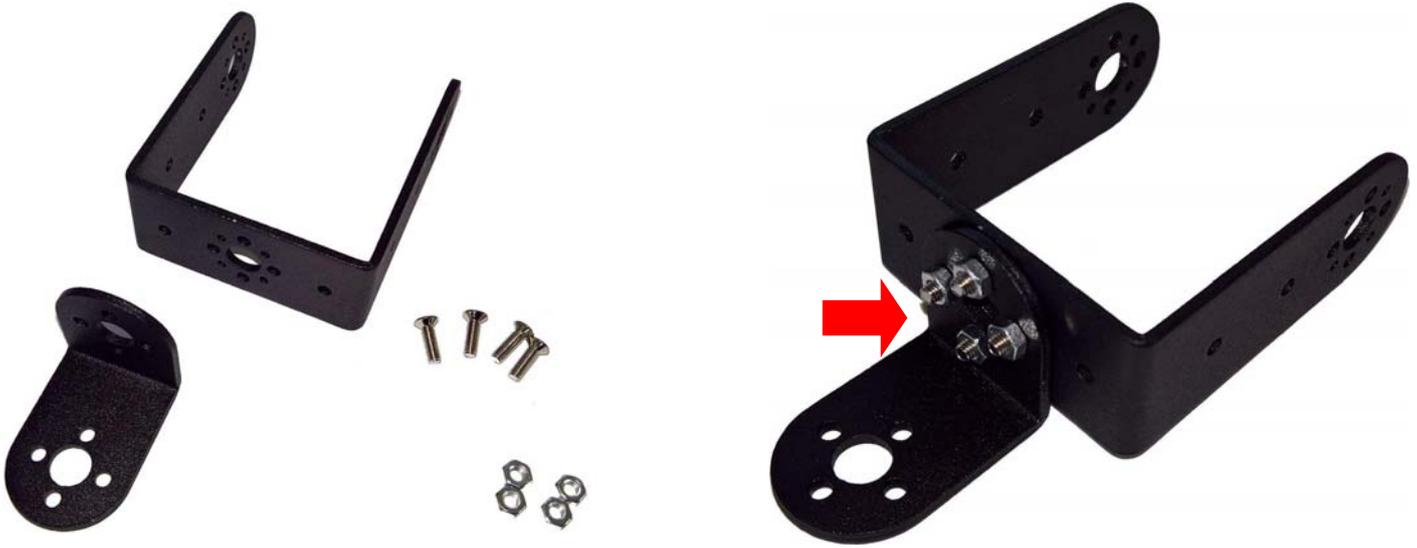
And place the servo and fix it with 4 screws and nuts.



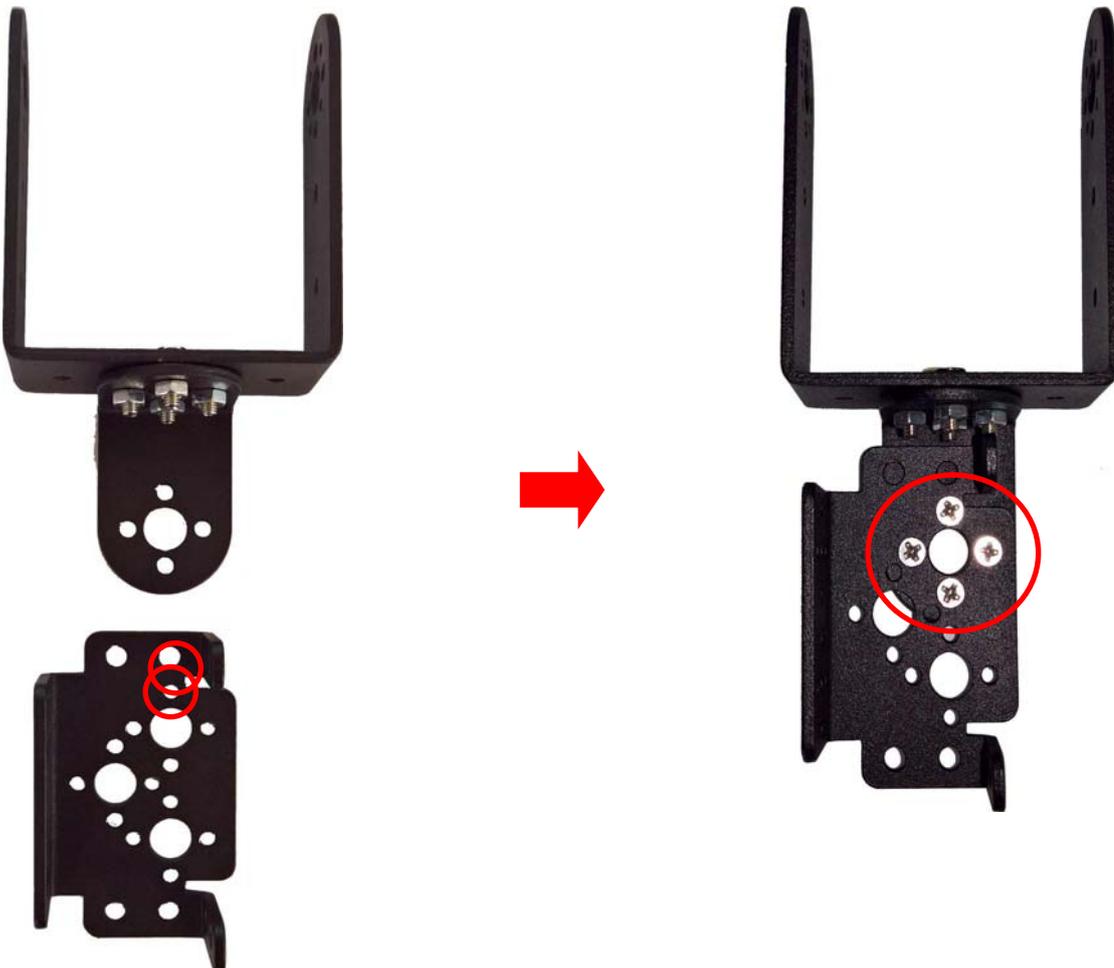
The arm of the servo is mounted to the arm with 4 screws.



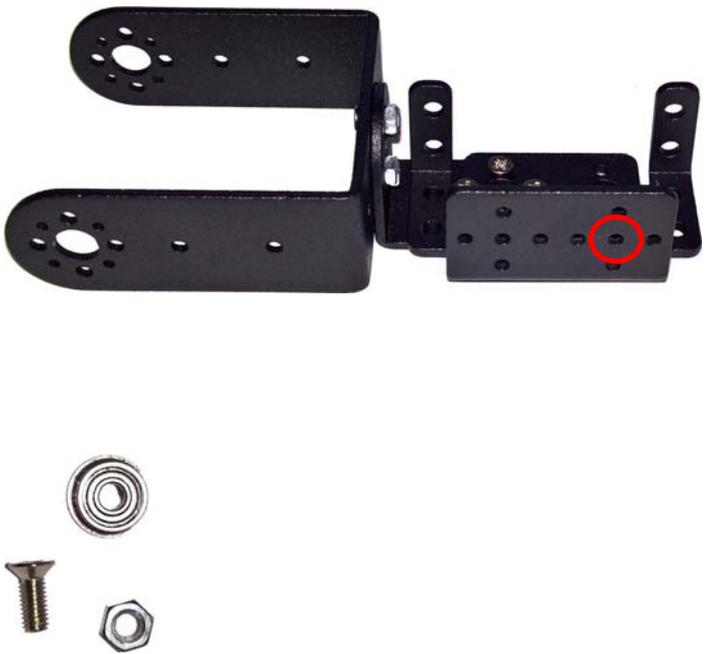
Another U-plate is mounted to the angle.



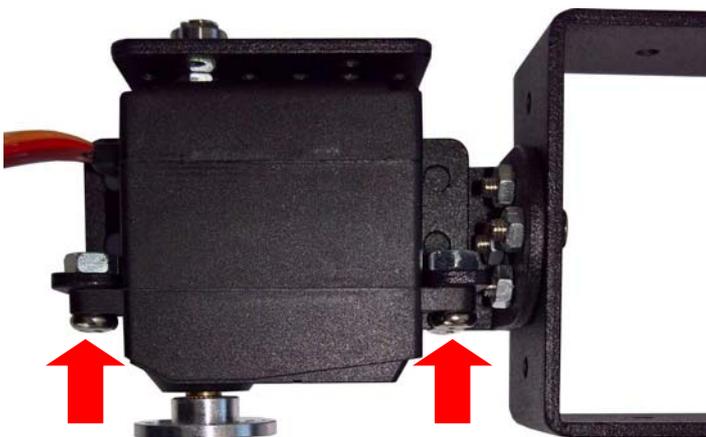
And then mounted to the servo-holder.



Now attach the bearing.



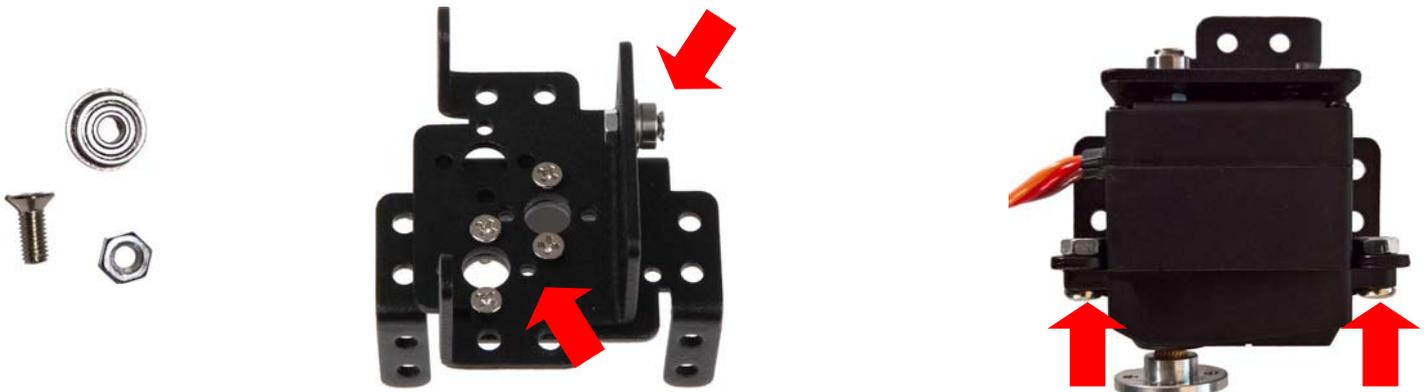
Place the servo motor and mount it with 4 screws and nuts. Mount it to the robot arm with screws on both sides.



Place two servo holders on each other and fix it with screws and nuts.



Mount the bearing and the servo.



Attach these to the robot arm. At last, another servo is mounted with 4 screws and nuts.

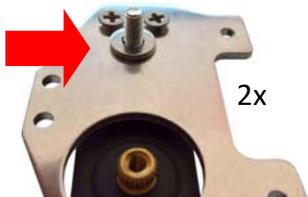
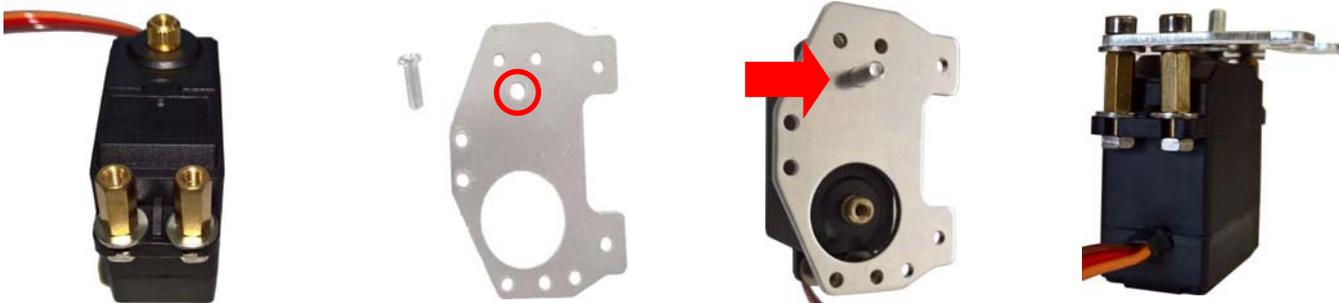


## 4. Mounting the claw

At first, 4 claw-fingers are screwed alternating with the brass spacers. In the end, fix the construction with screws on the one, and nuts on the other side.



Fix the holdings with screws.



Mount 4 brass spacers to the servo. Watch out that one washer is placed underneath and one washer is placed above the spacers. After that, place a screw through the plate and fix it to the servo.

Two washers are placed on the screw!!!

Place a bearing here.



Mount the first claw on the servo with a washer and a nut.



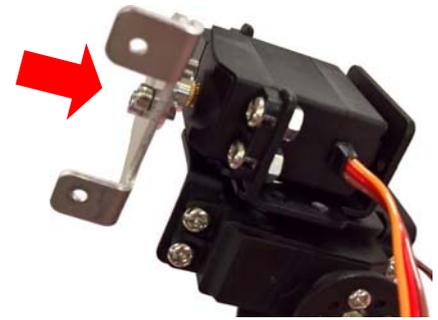
A servo-lever is mounted to the second claw.



The second claw is mounted and fixed with a screw.



Mount a servo-lever to the angle and fix it to the servo with a screw.



At last, fix the claw to the angle plate.



## 5. Other informations

While programming, please watch out that the intended position is reachable (that the motor can reach this position). This specifically applies to the claw.

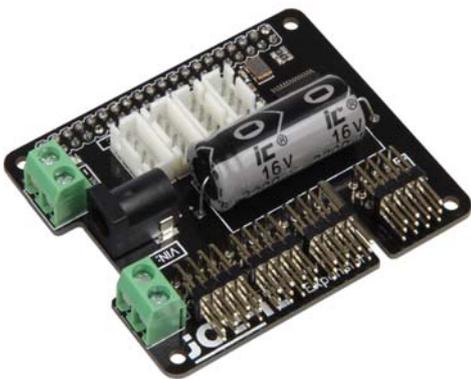
If the command for closing the claw completely is given but an object is inside the claw, the motor is not able to reach this position. It will try to reach this position with its maximum power and is holding the object.

This is no problem for a very short time (e.g. to pass an object from A to B). But this condition is a high load for the motor and the gear and should not last for a long time. An overload can heat and/or damage the motor.

Please watch out, when choosing accessories like motor-control or power supplies, for a suitable dimension.

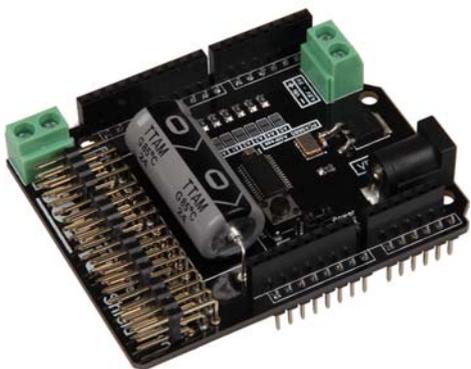
The motors are having, at 7.4V DC, a current demand of up to 2A per unit. 6 motors are used.

## 6. Optional accessories



### Moto PI (Motor-control for Raspberry PI)

- 16 PWM channels for servo motors
- 2 current inputs for up to 12A
- Separate clock generator
- AD converter allows controlling by joystick
- Capacitor for buffering



### Motorino (Motor-control for Arduino Microcontroller)

- 16 PWM channels for servo motors
- 2 current inputs for up to 12A
- Separate clock generator
- AD converter allows controlling by joystick
- Capacitor for buffering

## 7. Service & Contact

### We also support you after your purchase.

If there are any questions left or if you encounter any problems, please feel free to contact us by mail, phone or our ticket-supportsystem.

**E-Mail:** [service@joy-it.net](mailto:service@joy-it.net)

**Ticket-System:** <http://support.joy-it.net>

**Phone:** +49 (0)2845 98469 – 66 (11- 18 Uhr an Werktagen)

For more informations, visit our website

**[www.joy-it.net](http://www.joy-it.net)**

Find latest manuals at

<http://anleitung.joy-it.net>

Find latest downloads at

<http://downloads.joy-it.net>

## Declaration of conformity

As manufacturer we, the Joy-IT Europe GmbH, declare that our product Robot02 matches the essential requirements during the intended use:

EMV-Richtlinie 2014/30/EU RoHS-Richtlinie 2011/65/EU

You can request the detailed declaration of conformity at the following address:  
JOY-iT Europe GmbH , Pascalstr. 8, D-47506 Neukirchen-Vluyn or by mail [service@joy-it.net](mailto:service@joy-it.net)

13.07.2017 Yue Yang director



Warning. This declaration of conformity only applies for our delivered components of the kit. The motors keep the conditions of the EMV guideline during the use of the declared voltage. By adding own parts, you become the manufacturer and need to ensure that your device matches the regulations.