

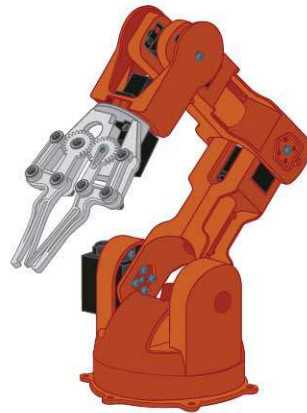
UNLOCK THE UNLIMITED POSSIBILITIES
OF ROBOTICS WITH THE BRACCIO

BRACCIO

QUICK

START

GUIDE



WELCOME

1 FOLLOW ASSEMBLY INSTRUCTIONS

2 CONNECT TO YOUR COMPUTER

3 ENJOY!

THIS KIT INCLUDES

✓ PLASTIC PARTS



✓ SCREWS

52 x \varnothing 3 mm

4 x \varnothing 2 mm

7 x

✓ FLAT WASHER

16 x

✓ HEXAGON NUT

7 x

✓ SPRINGS

2 x

✓ SERVO MOTORS

2 x SR 311, 4 x SR 431

✓ SHIELD

1 x Arduino-compatible shield

✓ POWER SUPPLY

1 x 5 V, 5 A

✓ SCREWDRIVER

1 x Phillips screwdriver

✓ BOX WRENCH

1 x Double-Hexagon Box Wrench

✓ SPIRAL PROTECTION

1 x Spiral Cable Protection Wrap

ASSEMBLY INSTRUCTIONS

CAUTION: DO NOT OVER-TIGHTEN SCREWS

1

M2
 4 × Ø 3mm

2

1 × Ø 2mm
 1 ×

3

4 × Ø 3mm

4

4 × Ø 3mm

5

M3
 3 × Ø 3mm
 1 × Ø 2mm
 1 ×

6

4 × Ø 3mm

7

8

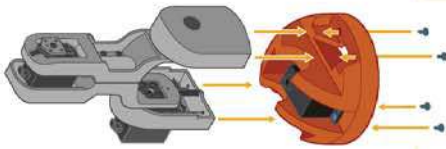
M1
 4 × Ø 3mm

9

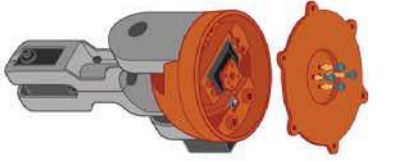
10



4 × Ø 3mm

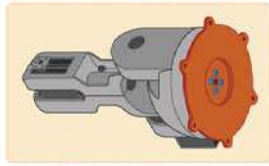


9

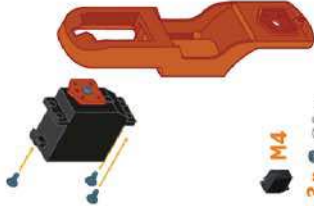


4 × Ø 3mm

10

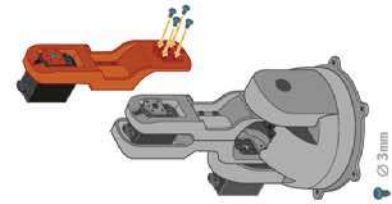


11



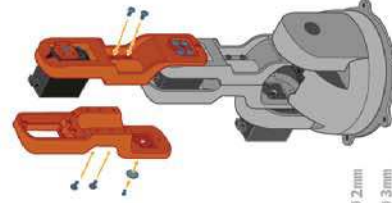
M4
3 × Ø 3mm

12



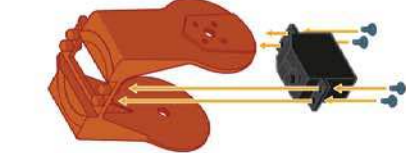
4 × Ø 3mm

13



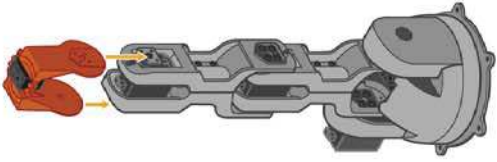
1 × Ø 2mm
1 × Ø 2mm
4 × Ø 3mm

14



15

1 × Ø 2mm
1 × Ø 2mm
4 × Ø 3mm

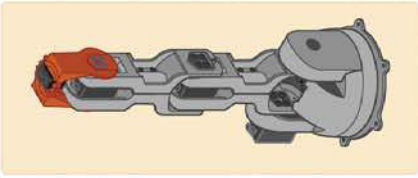


16

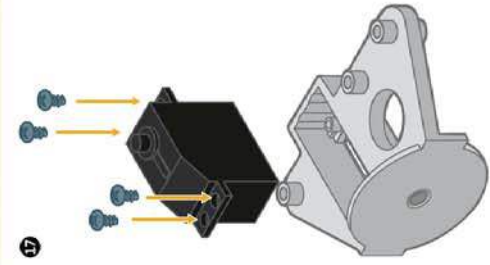
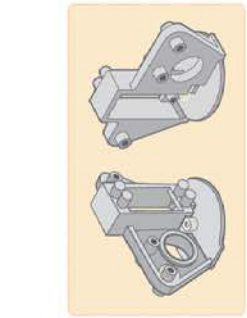


M5
4 × Ø 3mm

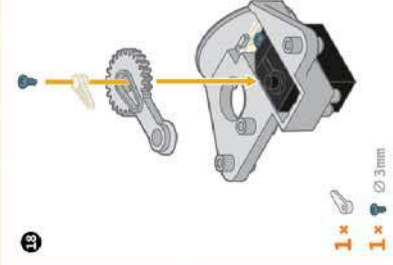
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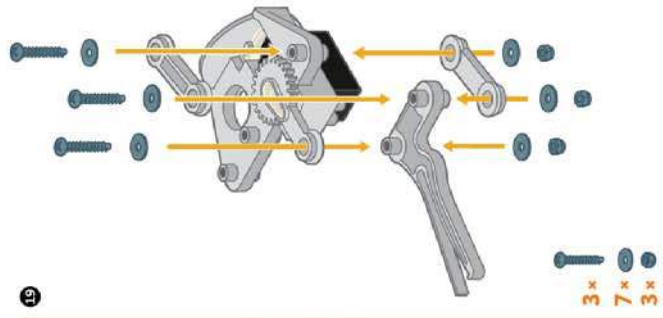
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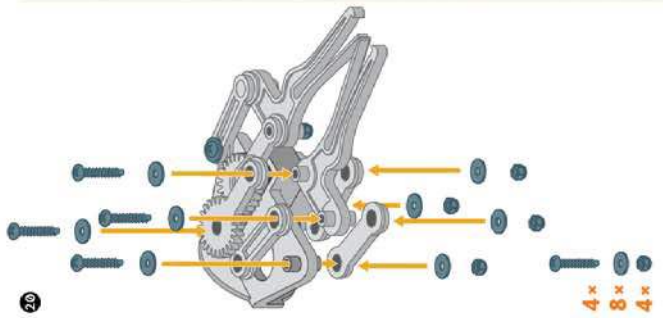
M6
4 x \varnothing 3mm



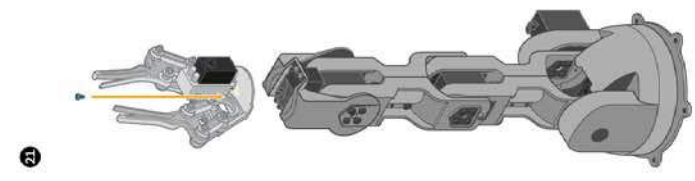
1 x \varnothing 3mm
1 x



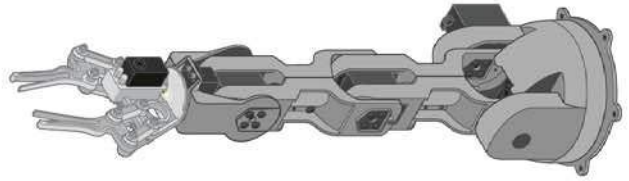
3 x
7 x
3 x



4 x
8 x
4 x

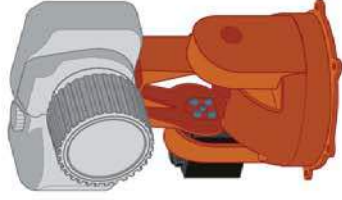
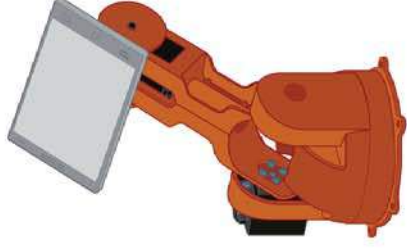
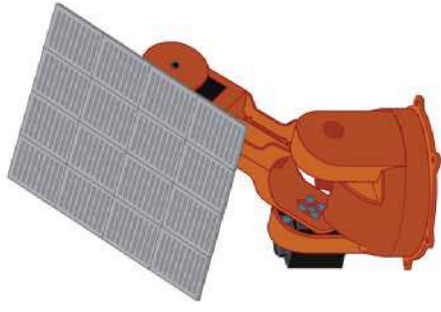


1 x \varnothing 3mm

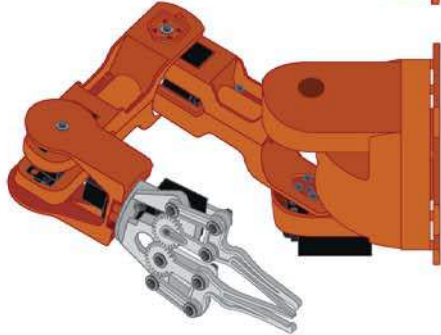
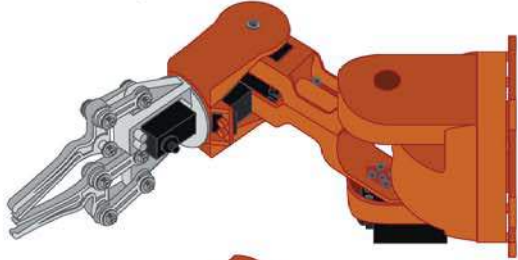
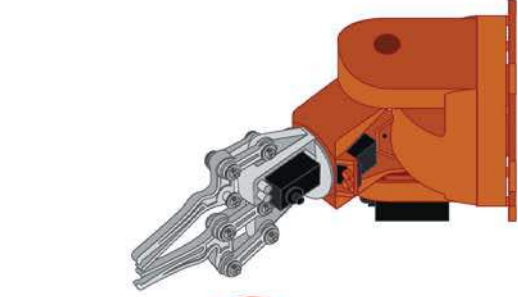


DONE!

DESIGNED FOR VERSATILITY,
THE BRACCIO CAN SUPPORT VARIOUS
OBJECTS ON THE END OF THE ARM

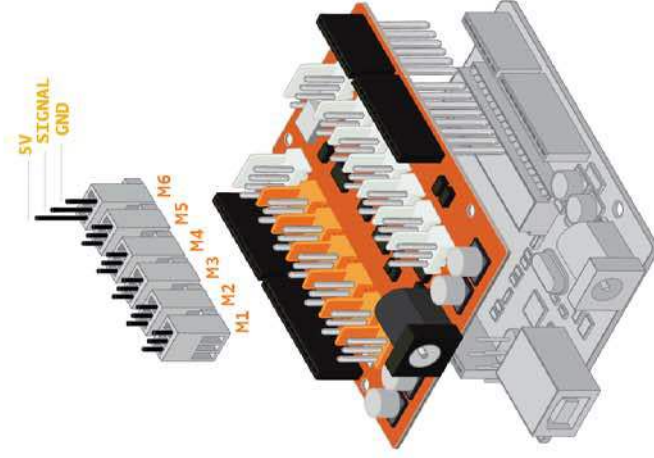


UNLOCK THE UNLIMITED
POSSIBILITIES OF ROBOTICS
WITH THE BRACCIO



MOTORS ASSEMBLY

- MOTOR "1" BASE
- MOTOR "2" SHOULDER
- MOTOR "3" ELBOW
- MOTOR "4" VERTICAL WRIST
- MOTOR "5" ROTATORY WRIST
- MOTOR "6" GRIPPER



ARDUINO COMPATIBLE BOARDS

- UNO
- UNO SMD
- DUE
- MEGA 2560
- MEGA ADK
- ETHERNET
- LEONARDO
- LEONARDO ETH
- YUN
- TIAN
- UNO WIFI

CONNECTING TO YOUR COMPUTER

- 1 DOWNLOAD THE SOFTWARE**
Get the latest version of the Arduino Software from ARDUINO.ORG/DOWNLOADS
- 2 CONNECT THE BRACCIO**
Plug the USB cable to the control board port, and wait for hardware installation to finish
- 3 CONNECT YOUR BOARD**
Start the Arduino IDE
Select **Tools** → **Board** → Select the board you are using
Select the correct serial port from **Tools** → **Port**
- 4 LOAD A SKETCH**
Select a sketch from **File** → **Examples** → **Braccio**
Press the Upload button  and wait for the program to finish uploading
CONGRATULATIONS!
You are ready to experiment and play

ONLINE TUTORIALS AND INFORMATION:
ARDUINO.ORG/BRACCIO

RUN YOUR SKETCH

1 TESTBRACCIO90

"testBraccio90" is a setup sketch allowing you to check the alignment of all the servo motors. It is also the first sketch you need to run on the Braccio. The sketch will position the Braccio in the upright position as seen in the picture below. If it doesn't, put the Braccio in the exact setting, you need to realign the position of the servo motors.



M1 = base degrees
M2 = shoulder degrees
M3 = elbow degrees
M4 = vertical wrist degrees
M5 = rotatory wrist degrees
M6 = gripper degrees

Braccio begin();

Initialization functions and set up the initial position for Braccio.

All the servo motors will be positioned in the "safety" position: M1 = 90°, M2 = 45°, M3 = 180°, M4 = 180°, M5 = 90°, M6 = 10°.

The sketch will position the Braccio in the upright position.

Step Delay: a milliseconds delay between the movement of each servo. Allowed values: from 10 to 30 msec

M1 allowed values from 0° to 180°
M2 allowed values from 15° to 165°
M3 allowed values from 0° to 180°
M4 allowed values from 0° to 180°
M5 allowed values from 0° to 180°
M6 allowed values from 10° to 73° (10°: the gripper is open, 73°: the gripper is closed).

```
1 #include <Braccio.h>  
2 #include <Servo.h>
```

```
3 Servo base;  
4 Servo shoulder;  
5 Servo elbow;  
6 Servo wrist_ver;  
7 Servo wrist_rot;  
8 Servo gripper;
```

```
9 void setup() {  
10   Braccio.begin();  
11 }
```

```
12 void loop() {  
13   //((step_delay, M1, M2, M3, M4, M5, M6);  
14   Braccio.ServoMovement(20, 90, 90, 90, 90, 90, 73);  
15 }
```


6 SIMPLEMENTMENTS

The "simplemovements" sketch shows you how each servo motor of the Braccio moves.

M1 = base degrees
M2 = shoulder degrees
M3 = elbow degrees
M4 = vertical wrist degrees
M5 = rotatory wrist degrees
M6 = gripper degrees

Braccio begin();

Initialization functions and set up the initial position for Braccio.

All the servo motors will be positioned in the "safety" position: M1 = 90°, M2 = 45°, M3 = 180°, M4 = 180°, M5 = 90°, M6 = 10°.

The delay() function lets you stop the

Arduino from executing anything for a period of time.

Step Delay: a milliseconds delay between the movement of each servo. Allowed values: from 10 to 30 msec.

M1 allowed values from 0° to 180°

M2 allowed values from 15° to 165°

M3 allowed values from 0° to 180°

M4 allowed values from 0° to 180°

M5 allowed values from 0° to 180°

M6 allowed values from 10° to 73° (0°: the gripper is open, 73°: the gripper is closed).

```
1 #include <Braccio.h>
2 #include <Servo.h>
```

```
3 Servo base;
4 Servo shoulder;
5 Servo elbow;
6 Servo wrist_ver;
7 Servo wrist_rot;
8 Servo gripper;
```

```
9 void setup() {
10   Braccio begin();
11 }
```

```
12 void loop() {
13   //step delay M1, M2, M3, M4, M5, M6);
14   Braccio_ServoMovement(20, 15, 0, 180, 180, 0, 73);
15   delay(1000);
16   Braccio_ServoMovement(20, 165, 180, 0, 0, 180, 10);
17   delay(1000);
18 }
```

6 TAKETHESPONGE

This example tells the Braccio to take the sponge from the table and show it to the user.

M1 = base degrees
M2 = shoulder degrees
M3 = elbow degrees
M4 = vertical wrist degrees
M5 = rotatory wrist degrees
M6 = gripper degrees

Braccio.begin();

Initialization functions and set up the initial position for Braccio.

All the servo motors will be positioned in the "safety" position. M1 = 90°, M2 = 45°, M3 = 180°, M4 = 180°, M5 = 90°, M6 = 10°.

Starting position

One second **delay**.

The braccio moves to the sponge.

Close the tongue to take the sponge

Brings the sponge upwards.

Show the sponge.

Return to the start position.

Open the gripper.

For **Step Delay** and **Motors** values please refer to the previous sketches.

```
1 #include <BRACCIO.h>
2 #include <Servo.h>
```

```
3 Servo base;
4 Servo shoulder;
5 Servo elbow;
6 Servo wrist_ver;
7 Servo wrist_rot;
8 Servo gripper;
```

```
9 void setup() {
10   Braccio.begin();
11 }
```

```
12 void loop() {
13   //((step delay M1, M2, M3, M4, M5, M6);
14   Braccio.ServoMovement(20, 0, 45, 180, 180, 90, 10);
15   delay(1000);
16   Braccio.ServoMovement(20, 0, 90, 180, 180, 90, 10);
17   Braccio.ServoMovement(10, 0, 90, 180, 180, 90, 60);
18   Braccio.ServoMovement(20, 0, 45, 180, 45, 0, 60);
19   Braccio.ServoMovement(20, 180, 45, 180, 45, 0, 60);
20   Braccio.ServoMovement(20, 0, 90, 180, 180, 90, 60);
21   Braccio.ServoMovement(20, 0, 90, 180, 180, 90, 10);
22 }
```

Lined writing area with horizontal blue lines and a red margin line on the left side.

NOTES:

Lined writing area with horizontal blue lines and a red margin line on the left side.

CERTIFICATE OF ORIGIN

Thank you for choosing a Linkakit product. This product was produced, assembled and tested in Italy. The product is made in Italy and all of the manufacturing, assembling, testing and packaging took place entirely in Italy.

MANUFACTURING

All parts used in this product comply with the RoHS Directive. The RoHS Directive prevents all new electrical and electronic equipment from containing more than specified levels of lead, cadmium, mercury, hexavalent chromium, poly-brominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE). The RoHS Directive also states that the product must meet the electromagnetic compatibility standards set by the EU.

All parts are tested to meet EU consumer safety, health and environmental requirements.

RETURN POLICY

We put all of our expertise and care in this product. Should you, despite all our efforts, find any fault in it, please contact our distributor to find an "adequate" quality for a product replacement.

LIMITED WARRANTY STATEMENT

1.1. WARRANTY

AROUND warrants that its products will conform to the Specifications. This warranty lasts for one (1) year from the date of the sale. AROUND shall not be held liable for any damage caused by neglect, misuse or misoperation by the Customer, including improper installation or testing, or for any products that have been used or modified in a manner not intended by AROUND. AROUND shall not be liable for any defects that result from the Customer's design, specifications or instructions for such products. Testing and other quality control procedures are used to the extent AROUND deems necessary.

1.2.

If any AROUND products fail to conform to the Specifications, AROUND shall be held liable. AROUND's liability shall be to replace such products. AROUND's liability shall be limited to products that are determined by AROUND not to conform to such warranty. AROUND shall not be held liable for any damage caused by neglect, misuse or misoperation by the Customer. Replaced products shall be warranted for a new full warranty period.

1.3.

EXCEPT AS SET FORTH ABOVE, PRODUCTS ARE PROVIDED "AS IS" AND "WITH ALL FAULTS". AROUND DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

1.4

The Customer agrees that prior to using any systems that include AROUND products, the Customer shall be responsible for the proper functionality of the products as used in such systems. AROUND may provide technical, applications or design advice, quality assurance, reliability data or other information that providing these services shall not extend or otherwise alter AROUND's warranties, as set forth above, and that no additional obligations or liabilities shall arise from AROUND providing such services.

1.5

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Customer acknowledges and agrees that the Customer is the sole responsible party with all legal, regulatory and safety-related requirements concerning the products and any use of AROUND products in the Customer's system. AROUND shall not be held liable for any related information or support that may be provided by AROUND.

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3. CHANGES TO SPECIFICATIONS

AROUND may make changes to specifications and product descriptions at any time, without notice. The Customer must not rely on the absence of characteristics of any feature or function of a product as a warranty. AROUND reserves the right to make changes to specifications and shall have no responsibility whatsoever for conflicts or inconsistencies arising from such changes. The Customer is advised to check the Web Site or Materials is subject to change without notice. Do not finalize a design with this information.

FCC COMPLIANCE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Interference may occur when a particular piece of equipment is used in combination with other equipment. If interference is experienced, it may be corrected by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The following parties are responsible for the compliance of this radio frequency equipment with the FCC Rules: the manufacturer of the equipment subject to authorization under the verification procedure, the manufacturer of, in the case of imported equipment, the importer, the radio frequency equipment is notified by any party not working under the authority of the responsible party, the party performing the modification becomes the new responsible party.

Manufactured by
AROUND S r.l.
Via Romano, 12
10010 Scarmagno
Italy



ROHS COMPLIANT



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