The Mind Project’s
Iris 1 Robotic Arm

Packing List
Assembly instructions
Below you will find pictures and descriptions of each part. It may be helpful to take each piece out of the bag and place them on a table for easy access.

Support
1 Wooden base plate with weight
3 #8 screws
4 #6 screws

Braces
1 2-hole metal brace
1 3-hole metal brace
1 4-hole metal brace
1 5-hole metal brace
1 6-hole metal brace

Servos
4 HiTec HS-422 servos
1 HiTec Ultra Torque Motor HS-645MG

Extensions
4 Wire extenders

Gripper
1 Robix Gripper hand

Power
1 Sceptre power cord. 110vAC to 6vDC
Packing list

**Support**
1 Plastic cradle with
  2 machine screws
1 metal connector
1 metal cradle with
  2 nylon wing nuts

**Connection**
3 black plastic “Robix” servo connectors
3 Nylon washers
3 Attachment screws (on servos)

**Communication**
1 USB adapter A plug to Mini B plug

**Control**
1 Parallax servo motor controller

**Support**
1 #8-32 machine screw and nut
1 #6-32 machine screw and nut
1 3/4” corner brace
2 washers

**Attachment**
1 plastic base kit, including 2 hex bolts, 1 short and 1 long; 2 washers, a hex wrench (not in all sets); a circular base piece, a cylindrical base piece and the top base piece.
Assembly Instructions

Step 1
Attach circular plastic piece to base. Make sure the screws line up with the holes drilled in the base and the dimples on the plastic piece face up. Take care not to overtighten the screws.

Step 2
Attach the cylindrical arm extender piece to the circular piece on the base. The protrusions from the cylinder should fit in the holes on the circular piece.
Step 3
Put long hex bolt through the hole in the base from the bottom. It should stick out of the top of the cylindrical piece you just attached.

Step 4
Attach the top part of the base to the rest of the assembly. Tighten everything down with a 3/6” hex wrench.
Assembly Instructions

Step 5
Place the 6-hole arm support on the top of the base, open end up, as shown in the above photo.

Step 6
Screw the short bolt into the plastic base piece. Add a washer between the bolt and the metal piece so it holds snugly.
Step 7
Insert the High-Torque servo, labeled HS-645MG into the back hole of the 6-hole support. The white gear drive should fit inside the hole of the plastic base piece. Once this is inserted, swing the assembly through its full range of motion to make sure it rotates about the same distance from side to side. If it doesn’t, take the servo out, reposition the arm and try again. You should hear the motor spin when you rotate the arm back and forth.

Step 8
Wrap the plastic cradle around the servo, and feed the attached metal bracket underneath the metal brace. Tighten the screws.
Step 9
The next piece you will attach is a standard HS-422 servo. You will need the metal cradle and the two plastic wing nuts to complete this step.
Place the servo underneath the 6-hole bracket with the white drive gear pointed to the left as seen from the front. Feed the cradle around the servo and up through the holes of the brace. Attach the wing nuts and tighten everything down.

Step 10
Place the 2-hole metal brace over the servo you just attached.
Step 11
The next set of steps requires the 5-hole support brace, a nylon washer, a plastic servo connector and a screw (currently attached to the servo)

Step 12
Attach the 5-hole brace to the servo you just attached. Put a nylon washer between the two metal braces. Tighten the screw. Again, rotate the servo to make sure it has an even motion up and down.
Step 13
Add another HS-422 Servo to the other end of the 5-hole brace.

Step 14
You’ll need the 4-hole metal brace, a servo and a plastic servo connector for the next set of steps.
Step 15
Following the same steps as before, attach the 4-hole arm brace, nylon washer, servo connector and motor to the previous assembly.

Step 16
Now gather together the gripper hand, another servo motor, the angle brace, the #8 and #6 screws, nut and washer, and the 3-hole arm brace with its connector and white nylon washer (not pictured).
Step 17
Attach the angle brace to one end of the 3-hole arm brace with the #8 (the thicker one) screw, a washer and nut as shown in the photo above.

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Step 18
Thread the #6 screw (the thinner one) into the gripper hand as shown above. A screwdriver will make this easier.
Step 19
Attach the angle gripper hand to the angle brace using a small washer and a nut. Your assembly should look like the one above.

Step 20
Now attach the gripper assembly to the rest of the arm as shown, using the nylon washer and servo connector.
Step 21
Attach the last servo motor into the gripper hand as shown. Make sure the arm opens and closes correctly.
Note: This servo sits in the gripper hand without a screw.
Congratulations! You’ve finished the arm!
Step 22
Now we need to hook up the Parallax servo controller to the arm. Start by removing 1/4” of insulation from the clipped ends of the power supply. Feed these through the hole on the front of the board.

Step 22
Insert the stripped wires into the holes in the green power inputs on the circuit board. You may need to give the wires a twist to get them in the holes.

NOTE 1: Make sure no stray strands of wire are left out of the holes. These could touch the other side and cause a short in the wires.

NOTE 2: When you power up the arm for the first time, if the servos do not move when you tell them to, try switching the positions of these wires.
Step 23
Tighten down the 4 screws, being careful not to overtighten them and crack the board.

Step 24
Now we’ll start attaching the servos to the board. You’ll need the wire extenders for the next steps. To start, remove the cable extenders from their packages and attach one to each of the servo motors except the high-torque servo motor (the first one you attached to the plastic base.) The darkest servo wire should be connected to the darkest cable extender wire on all of these extenders when you’re done.
Step 25
To start, attach the high-torque servo motor’s wire, the only one without a
cable extender, to plug P15 on the parallax board. The darkest wire should
face out.

Step 26
Continue down the line, connecting the servo between the 6-hole and 5
hole support to P14, the servo between the 5-hole and 4-hole supports to
P13, The servo between the 4-hole and 3-hole connector to P12, and the
servo attached to the gripper hand to P11.
Step 27
Attach the USB cable to the board and your computer, plug in the power and turn on the switch. If the red light comes on, you’ve done it!