Quick Intro

mDrawBot is an advanced transformable drawing robot kit based on Makeblock platform. It can be assembled into 4 forms — mScara, mSpider, mEggBot and mCar. It also comes with a matched software named mDraw.

Construct Your Dreams

Check the parts according to the Part List. Anything missing, please contact Makeblock.

Pen Lift Mechanism is applied to every form of this four-in-one drawbot. Refer here to see the assembly of the Pen Lift Mechanism.

mScara is one form of this four-in-one drawbot which can be fixed on the table to draw. Refer here to see the assembly of mScara.

Tip

Pen Lift Mechanism

mScara
### Part List

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beam024-012</td>
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</tr>
<tr>
<td>Beam024-096</td>
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<tr>
<td>Beam024-184</td>
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</tr>
<tr>
<td>Bracket 3</td>
<td>1</td>
</tr>
<tr>
<td>Plate 3</td>
<td>2</td>
</tr>
<tr>
<td>Bracket U1</td>
<td>4</td>
</tr>
<tr>
<td>Timing Pulley Slice 90T</td>
<td>2</td>
</tr>
<tr>
<td>42BYG Stepper Motor Bracket</td>
<td>2</td>
</tr>
<tr>
<td>Plastic Timing Pulley 90T</td>
<td>2</td>
</tr>
<tr>
<td>Tire 90T B</td>
<td>2</td>
</tr>
<tr>
<td>Caster Wheel</td>
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</tr>
<tr>
<td>Rubber Blanket</td>
<td>2</td>
</tr>
<tr>
<td>Shaft Connector 4mm</td>
<td>2</td>
</tr>
<tr>
<td>Timing Pulley 18T</td>
<td>5</td>
</tr>
<tr>
<td>Pen Holder and V Clamp</td>
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</tr>
<tr>
<td>2 inch G Clamp</td>
<td>2</td>
</tr>
<tr>
<td>Plastic Hinge</td>
<td>1</td>
</tr>
<tr>
<td>Plastic Hinge Gasket</td>
<td>1</td>
</tr>
<tr>
<td>Spring 0.6×L×S0</td>
<td>1</td>
</tr>
<tr>
<td>Threaded Shaft 4×L×S0</td>
<td>1</td>
</tr>
<tr>
<td>Circle Shaft 4×L×S0</td>
<td>1</td>
</tr>
<tr>
<td>Shaft Collar 4mm</td>
<td>2</td>
</tr>
<tr>
<td>Flange Bearing 4×L×S0</td>
<td>5</td>
</tr>
<tr>
<td>Square Nut M4</td>
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<tr>
<td>Nylon Cap M4</td>
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<tr>
<td>Timing Belt 112MXL</td>
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<tr>
<td>Belt Pulley 112M</td>
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<tr>
<td>9g Micro Servo Pack</td>
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<td>42BYG Stepper Motor</td>
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<tr>
<td>Base Bracket</td>
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<td>Battery Holder</td>
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<td>Makeblock Orion</td>
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<td>AC/DC Adapter 12V2A</td>
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<tr>
<td>6 Headless Set Screw M3×S</td>
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<td>Countersunk Screw M3×S</td>
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<td>Nylon Stud M4×S</td>
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<tr>
<td>Plastic Ring 4×S×N</td>
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<tr>
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<tr>
<td>Plastic Ring 4×S×N</td>
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<tr>
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<tr>
<td>P6C RJ25 Cable - 35cm</td>
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<td>Micro USB Cable</td>
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<td>Spring 0.6</td>
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<td>Nylon Stud M4×S</td>
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<tr>
<td>Plastic Ring 4×S×N</td>
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<tr>
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<tr>
<td>42BYG Stepper Motor Driver</td>
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<tr>
<td>8125 Adapter</td>
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<tr>
<td>AC/DC Adapter 12V2A</td>
<td>1</td>
</tr>
<tr>
<td>9g Servo Extension Cord</td>
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</tbody>
</table>

### Warning:

Keep this kit out of the reach of children or animals. Small parts may cause choking or serious injury if swallowed.

*All pictures in this manual do not represent the actual scale of them.*

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- **mSpider** is one form of this four-in-one drawbot which enables you to draw on a blackboard or a wall. Refer here to see the assembly of mSpider.
- **mEggBot** is one form of this four-in-one drawbot which enables you to draw on an egg or a ping-pong. Refer here to see the assembly of mEggBot.
- **mCar** is one form of this four-in-one drawbot which enables you to draw on the ground. Refer here to see the assembly of mCar.
- To enable the Drawbot to move, it’s required to use the software mDraw with the Drawbot. Refer here to see the instruction for wiring, software, and related details.

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19mSpider

24mEggBot

31mCar

Wiring and software
Tip

With too many parts contained in this product, please assemble the Drawbot as per the steps indicated in this instruction to avoid confusion. Pay especially attention to the mark of "O", "X". Make sure you are doing exactly as required by the diagram marked with "O", otherwise the parts may be broken and the robot may fail to work normally.

Assembly Requirement

Please assemble the robot in strict accordance with the following three requirements, Otherwise it will result in inaccuracy or unsatisfying performance.

1. Make sure to tighten the screw and the nut.

Diagram

- **Part Number**: Screw M3×5(2)
- **Quantity**: 1.5mm
- **Assembly Sequence**: Ensure the end of the Shaft is pushing against the desktop.
- **Assembled Diagram**: Parts that are required in this step
- **Tool**: Screwdriver
- **Tool Model**: 1.5mm
- **Notes**: Make sure to tighten the screw and the nut.

Assembly Steps:

01. Tighten the screw with force according to the direction of the diagram
02. Tighten the nut with force according to the direction of the diagram
2. Make sure all parts are placed evenly before tightening the screws.

3. Press downward the parts related to the shaft with force to eliminate the gap before tightening the screw M3x5.
Before tightening the two screws, make sure the Pen Holder can be easily lifted up for 15°~45°.

Note: Make sure to assemble the robot in strict accordance with the requirements from P5-P7, otherwise it may result in inaccuracy or poor performance.
Pay attention to the direction when you installing the Square Nut M4, otherwise the Pen Holder will be broken.

Make sure all the three parts are properly aligned.

Note: Make sure to assemble the robot in strict accordance with the requirements from P5 - P7, otherwise it may result in inaccuracy or poor performance.
1. Make sure the end of the shaft is pushing against the desktop.

2. Screw M3×5(2)

3. Screw M4×16(2)

4. Nut M4(2)

5. Plastic Rivet R4120

6. Screw M3×5(1) 1.5mm

7. Shaft Collar 4mm

8. Screw M4×8(2)

9. Nut M4(2)

10. Screw M4×8(2)

11. Nut M4(2)

12. Screw M4×8(2)

13. Screw M4×16(2)

14. Screw M3×5(1) 1.5mm

※ Use one hand to press the Shaft Collar downward to minimize the gap between the parts, meanwhile use the other hand to tighten the M3×5 screw.
To avoid over-tension, do not tighten the screw.

※ Use one hand to press the Shaft Collar downward to minimize the gap between the parts, meanwhile use the other hand to tighten the M3x5 screw.
Note: Make sure to assemble the robot in strict accordance with the requirements from P5 - P7, otherwise it may result in inaccuracy or poor performance.
Screw M4×8(2)

Pen Lift Mechanism

Screw M4×8(2)

Screw M3×8(4)

Nut M4×2(4)

Screw M4×16(2)

Screw M4×16(3)

Nut M4(3)

Screw M4×16(1)

1.5mm × 2 × 2

The length of the string is around 8 meters, you can cut it into 2 strings with 4 meters each at most.

The size of the circle should be bigger than the head of screw M4.

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Note: Make sure to assemble the robot in strict accordance with the requirements from P5 - P7, otherwise it may result in inaccuracy or poor performance.
10. Spring: Compress the spring.

11. Screw M3×5(1)

12. Screw M4×8(2)

13. Screw M4×8(2)

14. Plastic Gasket 4×7×3

15. Plastic Gasket 4×7×10

16. Flange Bearing 4×8×3

17. Circle Shaft 4×80

18. Adjustable mScara, mSpider, mEggbot, mCar
Note: Make sure to assemble the robot in strict accordance with the requirements from P5 - P7, otherwise it may result in inaccuracy or poor performance.

Refer to Page 8

Software Download >
mDraw is the software designed to work with the mDrawBot. It’s required to download, install mDraw, and use it correctly in order to make your mDrawBot move.

1. Visit [this link](http://learn.makeblock.cc/mdrawbot/) to download mDraw and related specific instruction.
   - Note: It’s required to download the material mentioned above.
2. It’s strongly recommended that you should read the specific instruction before using the software.
3. Here’s the basic interface of mDraw.

mDraw is an open source project hosted on Github. Fork it here: [https://github.com/Makeblock-official/mDrawBot/](https://github.com/Makeblock-official/mDrawBot/)

Wiring

The USB interface of Makeblock Orion uses the chip CH340. You may need to install the chip CH340 driver manually.

Software & Related Details

Working With mDraw

1. Visit [this link](http://learn.makeblock.cc/mdrawbot/) to download mDraw and related specific instruction.
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Assembled Diagram

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Limited Warranty

This product is warranted against defects in materials and workmanship under normal use by the original purchaser for 90 days after the date of purchase from an authorized retailer. THERE ARE NO OTHER EXPRESS WARRANTIES.

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

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

This warranty does not cover: (a) damage or failure caused by or attributable to abuse, misuse, failure to follow instructions, improper installation or maintenance, accidental, act of God (such as flood or lightning), or excess voltage or current; (b) improper or incorrectly performed repairs by non-authorized service facilities; (c) consumables such as fuses or batteries; (d) normal wear and tear; (e) improper handling, misuse, abuse or neglect; (f) battery; (g) damage caused by unauthorized modification of, or attempt to repair; (h) failure to follow operating and maintenance specifications; or (i) product operated outside the USA or Canada.

The warranty covers repairs to be performed by or on behalf of the original purchaser. The original purchaser may request a refund if, after the expiration of the warranty, the product cannot be repaired in accordance with the warranty. The maximum refund under the warranty will be the purchase price paid by the original purchaser for the product. Should repair of the product be necessary, the original purchaser or the authorized representative of the original purchaser shall, at the option of the warrantor, be responsible for (a) returning the product to the place of purchase, or (b) shipping the product prepaid. The product, at the warrantor’s option, unless otherwise provided by law: (a) will be repaired without charge for parts and labor; (b) be replaced with the same or a comparable product; or (c) be refunded for the purchase price paid by the original purchaser for the product, within the stated warranty period. The product, at the warrantor’s option, unless otherwise provided by law: (a) will be repaired without charge for parts and labor; (b) be replaced with the same or a comparable product; or (c) be refunded for the purchase price paid by the original purchaser for the product, within the stated warranty period. The product, at the warrantor’s option, unless otherwise provided by law: (a) will be repaired without charge for parts and labor; (b) be replaced with the same or a comparable product; or (c) be refunded for the purchase price paid by the original purchaser for the product, within the stated warranty period.

This warranty does not cover (a) damage or failure caused by or attributable to abuse, misuse, failure to follow instructions, improper installation or maintenance, accidental, act of God (such as flood or lightning), or excess voltage or current; (b) improper or incorrectly performed repairs by non-authorized service facilities; (c) consumables such as fuses or batteries; (d) normal wear and tear; (e) improper handling, misuse, abuse or neglect; (f) battery; (g) damage caused by unauthorized modification of, or attempt to repair; (h) failure to follow operating and maintenance specifications; or (i) product operated outside the USA or Canada.

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Battery Notes

You use only batteries of the required size and type. Do not mix old and new batteries, different types of batteries (standard, alkaline, or rechargeable), or rechargeable batteries of different capacities.

Battery Disposal

• Dispose of batteries promptly and properly. Do not burn or bury them.

• If you do not plan to play with the robot for an extended period of time, remove the batteries.

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Read and follow all instructions in the user guide before using.

• As an extra precaution, check this product regularly for signs of wear or damage.

• Ensure all wiring connections are correct before inserting batteries and switching on the product.

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