

mBot Ranger add-on pack Laser Sword

www.makeblock.com

For more add-on packs please visit:



<http://learn.makeblock.com/en/ranger-add-on-packs/>

If you have any questions or concerns about our products,
please do not hesitate to contact us!

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mBlock Graphical Programming

mBot Ranger supports mBlock programming, mBlock download link:
<http://www.mblock.cc/download>

We have provided you with an mBot Ranger add-on pack- laser sword's case program;
to download the case program please visit:
<http://learn.makeblock.com/en/ranger-add-on-packs/>

After the download is completed, open the case program, connect the laser sword to
your computer, and upload the program to the laser sword control panel. Then you
can control your laser sword!

Knowledge for the add-on pack

LED RGB Strip Principle

The LED RGB strip includes a number of adjustable panchromatic RGB LEDs. Each LED
has three lights of different colors: red (R), green (G), and blue (B). By mixing red, green
and blue in different proportions, light of various colors can be obtained.

For example, red + green = yellow; in mBlock, set the light strip colors to: Red 60, Green
60, Blue 0, and yellow light will show.

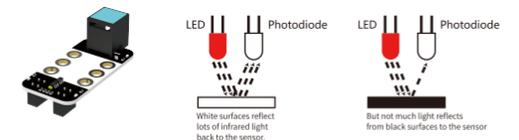
set led strip Port6 Slot2 all red 60 green 60 blue 0



Line Follower Sensor Principle

The line follower module consists of two sensors, each of which has an infrared
emission tube and an infrared receiving tube. The infrared ray is used to emit infrared
light during the operation of the robot by utilizing the characteristic of different
reflection intensity of the infrared light on the surface of different colors. Infrared
diffuse reflection occurs when light encounters a white paper floor, and the reflected
light is received by the receiving tube; if it encounters a black line the infrared light is
absorbed, and the receiving tube will not receive any infrared light; thus the black
line can be located by the infrared receiving status. (The line follower sensor output is
0 when infrared encounters black line, and 1 when infrared encounters white line).

While using the laser sword case program, when there is no touch to the line follower
sensor due to the lack of a reflective surface, the infrared emission tube can not be
reflected onto the infrared receiving tube. When you touch the line-follower sensor
with your fingers (keep a distance between your fingers and the sensor), infrared light
emitted by the infrared emission tube is reflected onto the receiver tube by your skin.
The "touch" control is achieved through determining whether the infrared light
received by the tube reaches certain value and whether the line-follower sensor is
touched.



APP control

MakeBlock APP has provided a control panel for the Laser Sword which allows you to
quickly control your Laser Sword with a mobile device using the preset consoles as
follows:

1. To download the MakeBlock APP, please go to:
<http://learn.makeblock.com/en/makeblock-app/>

2. Bluetooth connection. Connect the power and click on the switch to turn on Laser
Sword, and turn on the MakeBlock APP and close Laser Sword. (If you have a
program written on the mainboard, first use the mBlock connection → Restore
Factory → mBot Ranger command to restore the factory program, and then use the
MakeBlock app console.)

3. Select the laser sword control panel and start using your laser sword!

Parts List

Beam 0808-504-Blue ×2		Laser Sword Acrylic Plate ×2	
Beam 0824-048-Blue ×1		M4×35mm Screw ×2	
Me RJ25 Adapter Module ×1		M4×22mm Screw ×12	
LED RGB Strip (1m) ×1		M4×14mm Screw ×12	
M4 Nut ×16		M4×8mm Screw ×15	
Plastic Spacer 4×7×3mm ×25			

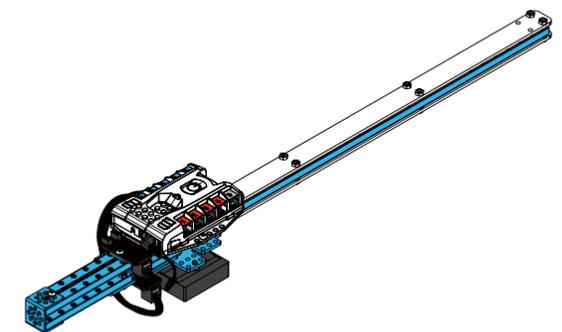
Screws and nuts(1:1 Scale)

	M4×8mm Screw		Plastic Spacer 4×7×3mm
	M4×14mm Screw		M4 Nut
	M4×22mm Screw		
	M4×35mm Screw		

0 1 2 3 4 Unit: millimeter (mm)

Any unknown parts can be checked here.

Laser Sword



Laser Sword Building Process

Preparation of Parts

The following parts of the Ranger kit are required to build the laser sword:

	Me Auriga x1		Bracket 3×3 x1		Plate for Battery Holder x1
	Beam 0824-112-Blue x2		Bracket U1 x1		Plate T-type x1
	Beam 0824-048-Blue x1		Line Follower Sensor x1		RJ25 Cable x2
	Plate 0324-88 x1		Battery Holder x1		

Use the above parts with the parts in this add-on pack for later construction.

Building Steps

1

Plate 0324-88	×1
Beam 0824-112-Blue	×1
M4×14mm Screw	×2
M4 Nut	×2

3

Bracket U1	×1
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5

LED RGB Strip (1m)	×1
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Use the scissors to cut off the last 2 lights from light strip.

7

Laser Sword Acrylic Plat	×1
Beam 0808-504-Blue	×2
M4×22mm Screw	×8
Plastic Spacer 4×7×3mm	×8

Tip: Please tear off the protective film of Acrylic board for later construction.

2

Bracket 3×3	×1
Beam 0824-112-Blue	×1
M4×8mm Screw	×4

4

M4×8mm Screw	×2
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6

Fold the LED strip, making sure the RGB lights face the inside. Used in step 8.

8

Place the folded LED strip between beams.

9

Laser Sword Acrylic Plate	×1
Plastic Spacer 4×7×3mm	×8
M4 Nut	×8

11

Line Follower Sensor	×1
M4×8mm Screw	×1

13

M4×14mm Screw	×1
Me RJ25 Adapter Module	×1

15

LED RGB Strip (1m)	×1
Me RJ25 Adapter Module	×1
Line Follower Sensor	×1

Wire connections
This is the reference picture of wire connections in construction examples. You can also change the ports according to your own program.

10

Note: The detail diagram is side view here. Please pay attention to the upper and lower positions of the parts and the direction of the thread groove of the beam during building process.

M4×35mm Screw	×2
M4 Nut	×2
Beam 0824-048-Blue	×2
Plate for Battery Holder	×1
Plate T-type	×1

12

Me Auriga	×1
M4×14mm Screw	×2
Plastic Spacer 4×7×3mm	×2

14

M4×14mm Screw	×2
Plastic Spacer 4×7×3mm	×2
Battery Holder	×1

16

Finished
Good job!
You have finished the construction.