Makeblock
Construct Your Dreams

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!

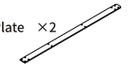
APP control

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/

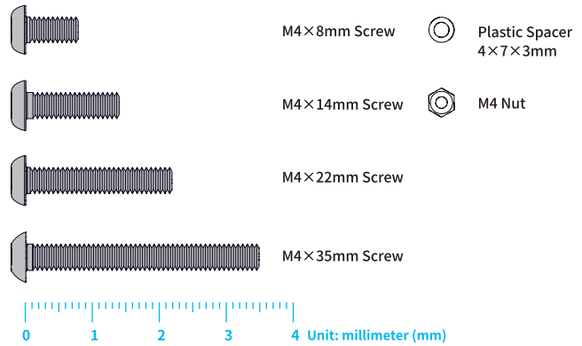
2.Bluetooth connection. Connect the power and click on the switch to turn on Laser Sword, and turn on the MakeBlock APP and close Laser Sword. (If you have a program written on the mainboard, first use the mBlock connection → Restore Factory → mBot Ranger command to restore the factory program, and then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



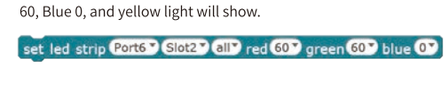
Any unknown parts can be checked here.

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.

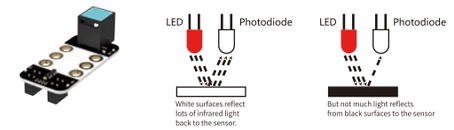
For example, red + green = yellow; in mBlock, set the light strip colors to: Red 60, Green 60, Blue 0, and yellow light will show.



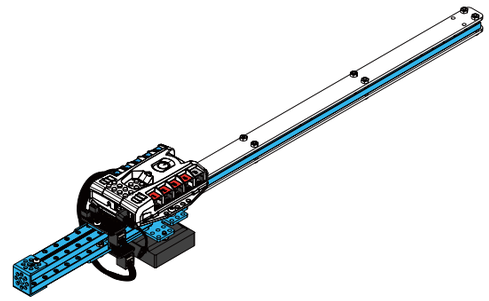
Line Follower Sensor Principle

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.

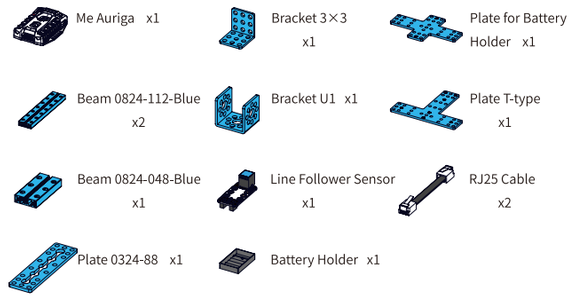


Laser Sword



Laser Sword Building Process

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

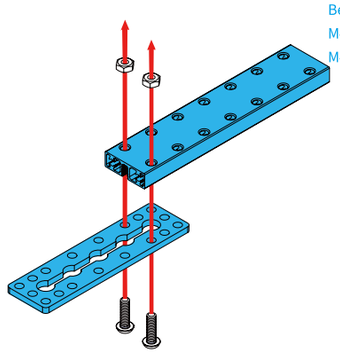


Use the above parts with the parts in this add-on pack for later construction.

Building Steps

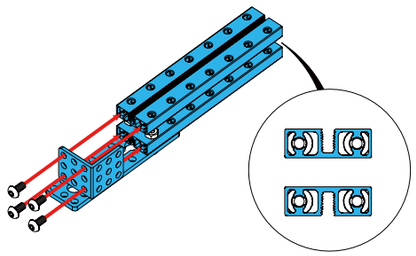
1

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



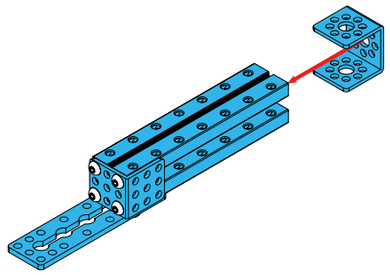
2

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



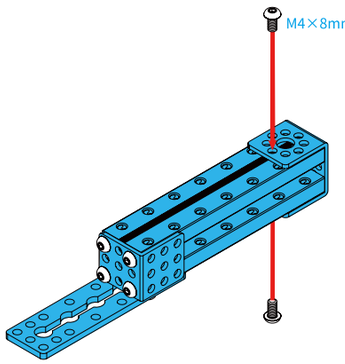
3

Bracket U1 ×1



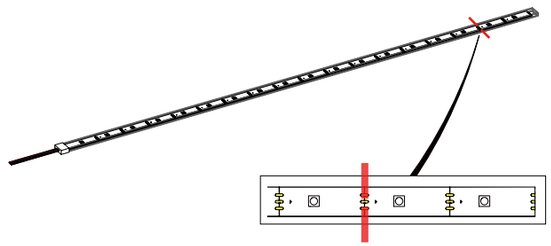
4

M4×8mm Screw ×2



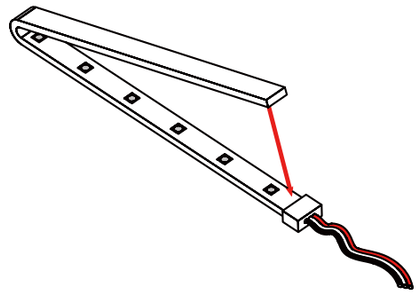
5

LED RGB Strip (1m) ×1



Use the scissors to cut off the last 2 lights from light strip.

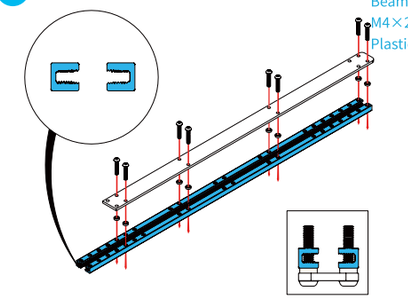
6



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

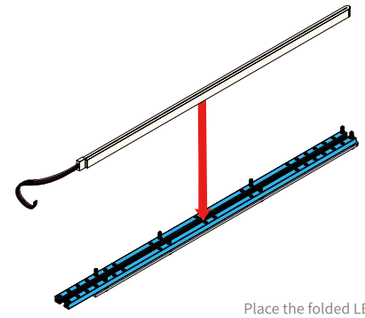
7

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.

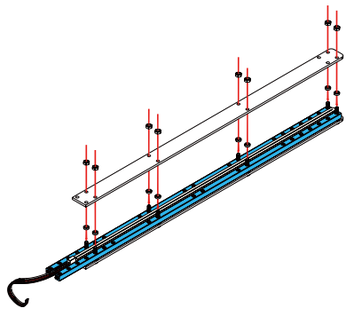
8



Place the folded LED strip between beams.

9

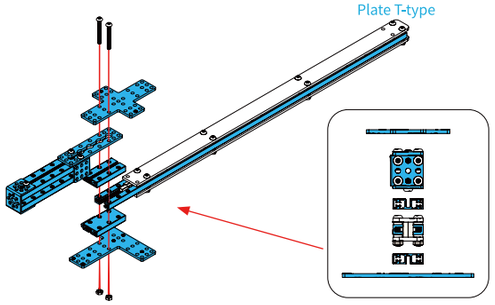
Laser Sword Acrylic Plate ×1
Plastic Spacer 4×7×3mm ×8
M4 Nut ×8



10

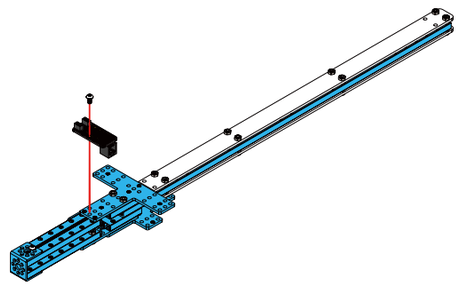
Note: The detail diagram is side view here. Please pay attention to the upper and lower positions of the parts and the direction of the thread groove of the beam during building process.

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



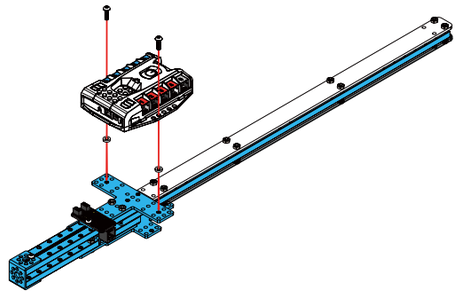
11

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



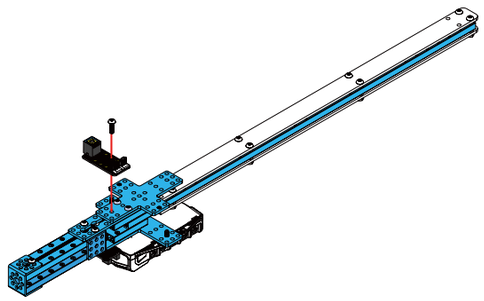
12

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



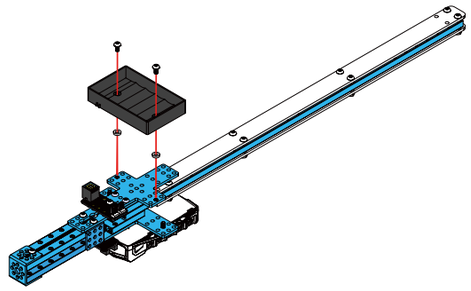
13

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

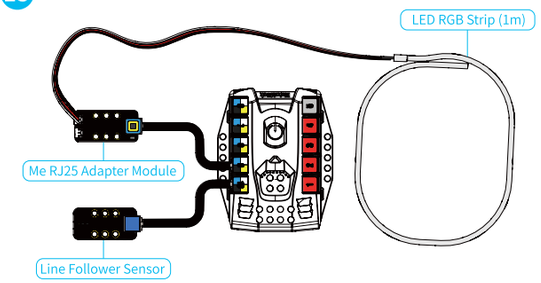


14

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



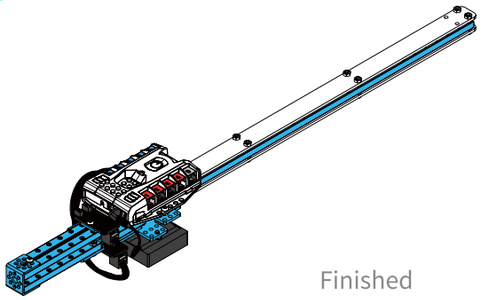
15



Wire connections

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

16



Finished

Good job!
You have finished the construction.