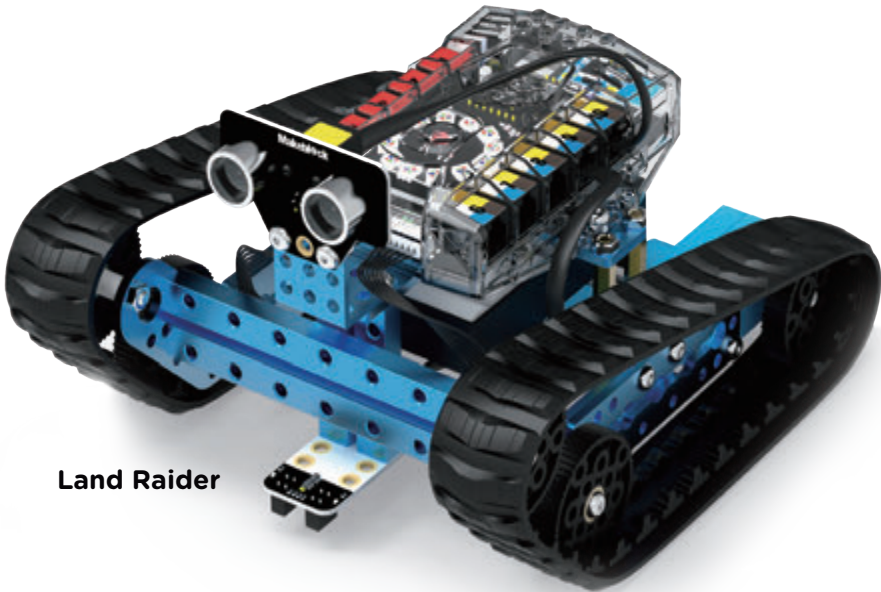


MakeBlock Ranger

Land Raider Building Instruction

This document extracts only the building instruction of this Land Raider from the full manual here : <http://learn.makeblock.com/en/ranger/>. In that full manual, you will find the building instructions for another two models



Land Raider



Parts List

2 x Beam0824-112



1 x Beam0824-48



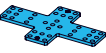
2 x Plate 0324-88



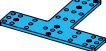
2 x Plate 135°



1 x Plate for Battery Holder



1 x Plate T-type



1 x Bracket 3x3



1 x Bracket U1



1 x Mini Caster Wheel



4 x 62T Wheel Without Step



2 x 62T Wheel



2 x 90T Wheel



2 x 90T Tyre



2 x Track



4 x Plastic Spacer 4x7x10mm



2 x 180 Encoder Motor



8 x Copper Bush 4x8x4mm



4 x Bruss Stud M4*30+6



1 x Battery Holder



1 x Me Auriga



1 x Ultrasonic Sensor



1 x Line Follower Sensor



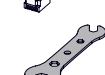
1 x USB Cable



2 x RJ25 Cable-20cm



1 x Wrench



1 x Hex & Cross Screwdriver



22 x Screw M4*8mm



4 x Screw M4*10mm



6 x Screw M4*14mm
(for standoffs)



4 x Screw M4*25mm
(for gears)



2 x Screw M2.5*12mm
(for motor gears)



10 x Nut M4



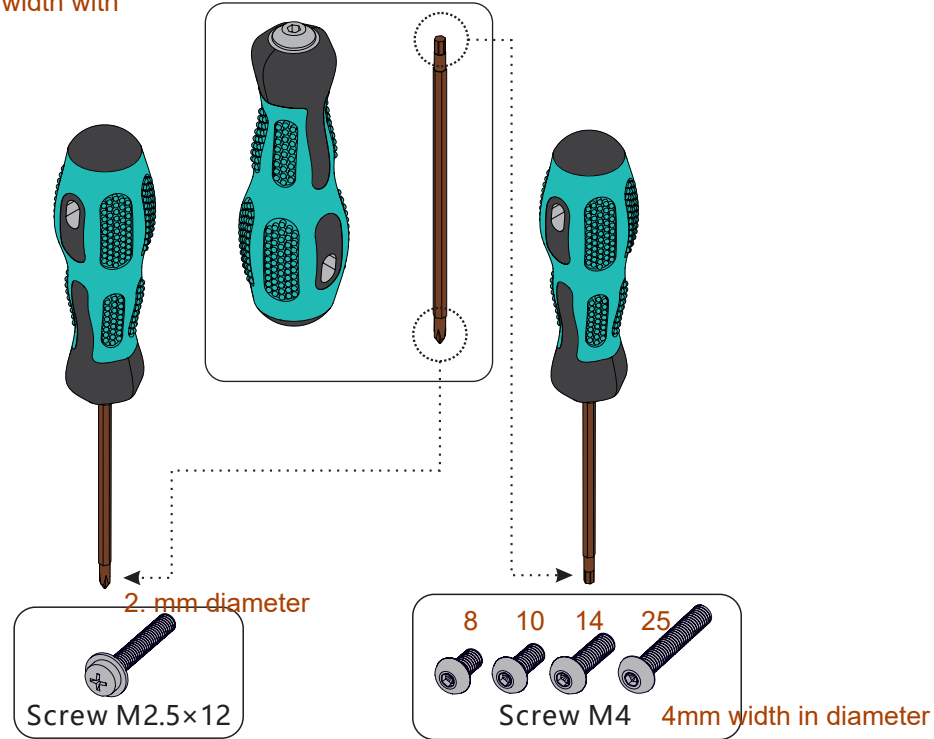
2 x Encoder Motor Wire



About the Tools

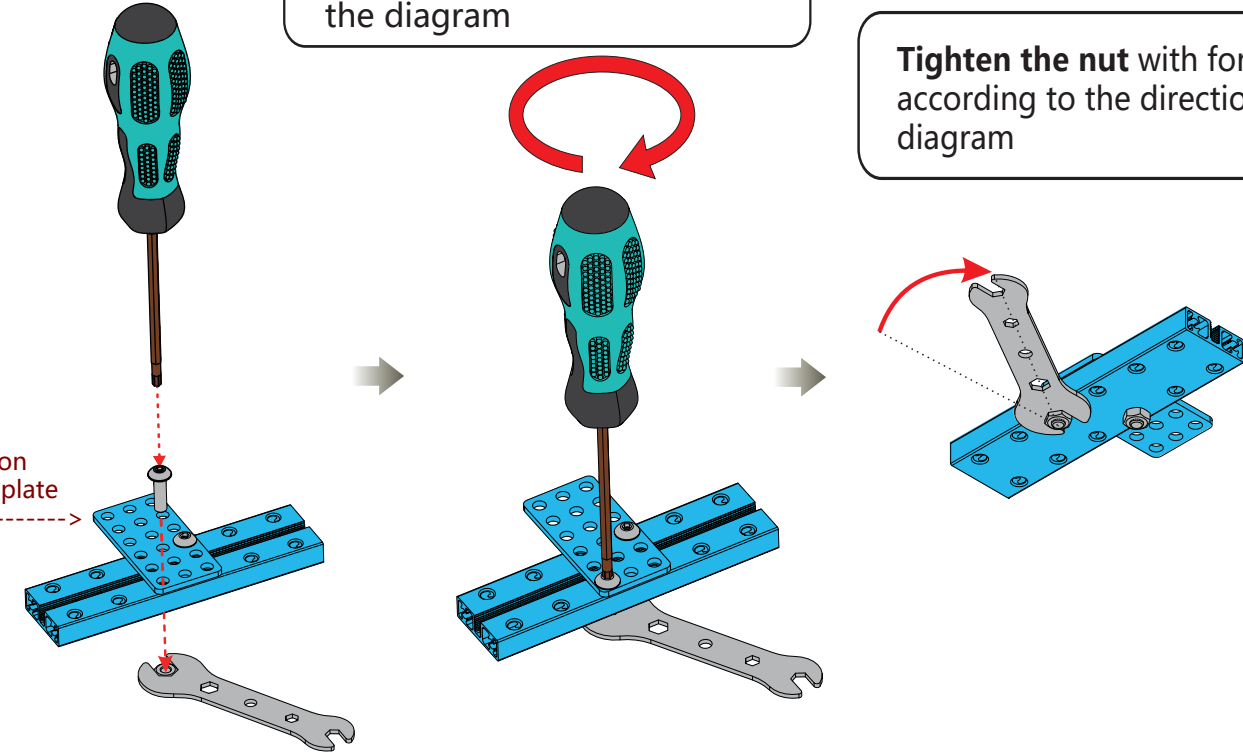
About the measurement of the screws:

- "M" denotes millimeters (mm)
- e.g. M4x8 = 4mm diameter width with 8mm length.

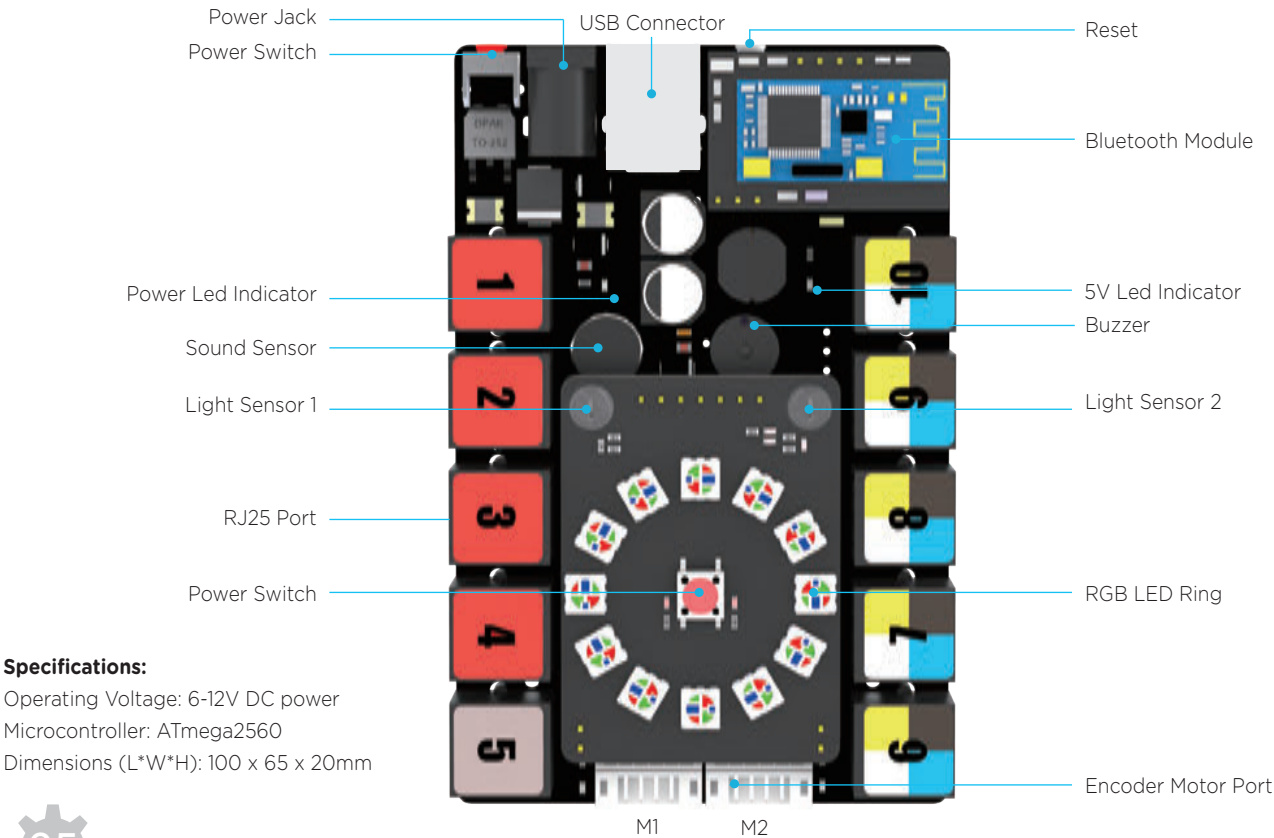


Recommendation: Identify screws by types before you proceed.

Do note: this is for illustration pupose only. This thin 3x6 plate is not in the RangerBot set.



Me Auriga



Specifications:
Operating Voltage: 6-12V DC power
Microcontroller: ATmega2560
Dimensions (L*W*H): 100 x 65 x 20mm



Introduction to Interfaces of Me Auriga

Tag Color	Compatible Module Types	Typical Me Modules
<div>1234</div>	(6-12V DC) Driven modules	Me Motor Driver Me Servo Driver Me Stepper Driver
<div>5</div>	Hardware serial port	Me Bluetooth Me Bluetooth Module (Dual-Mode)
<div>678910</div>	One way digital interface Dual digital interface I ² C port Dual & one way analog interface	Me Ultrasonic Sensor Me RGB LED Me Limit Switch Me 7 Segment Serial Display Me PIR Motion Sensor Me Shutter Me Line Finder Me Infrared Receiver Decode Me 3 Axis Accelerometer and Gyro Sensor Me Potentiometer Me Joystick Me 4Button Me Sound Sensor ...

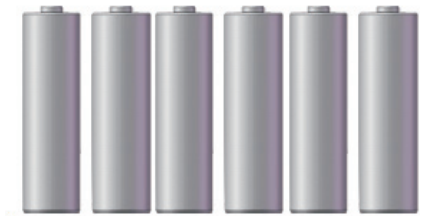


Battery Information

Battery for Ranger:
Option 1. 1.2V (6) AA rechargeable batteries. (Not included in this kit).
Option 2. 1.5V (6) AA alkaline battery (Not included in this kit). Energizer and DURACELL are recommended.
We recommend that you'd better use rechargeable batteries.

IMPORTANT BATTERY INFORMATION:

- Use only fresh batteries of the required size and recommended type.
- Do not mix old and new batteries, different types of batteries.
- Replace all batteries of the same type/brand at the same time.
- The supply terminals are not to be short-circuited.
- Remove exhausted batteries from the robot.
- Remove batteries if the robot is not going to be played with for some time.



LOW BATTERY INDICATORS:

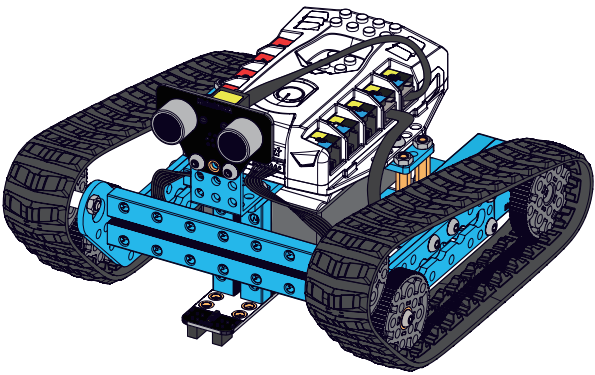
When the following phenomenon occurs, it means the Ranger batteries grow weak.

Land Raider & Dashing Raptor	If the robot moves very slowly, automatically restarts while turning, bumps into thing or doesn't move at all despite the motor speed being set to full power, the batteries are low.
Nervous Bird	If the robot easily loses its balance while moving or turning, the batteries are low.



Under these circumstances, you should power off the robot and replace or charge the batteries.

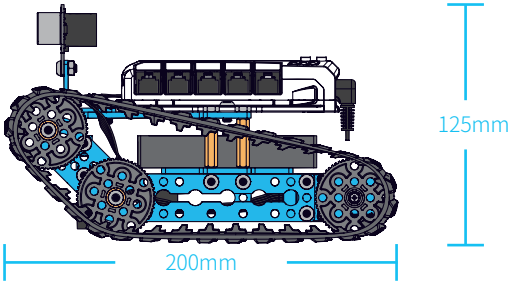
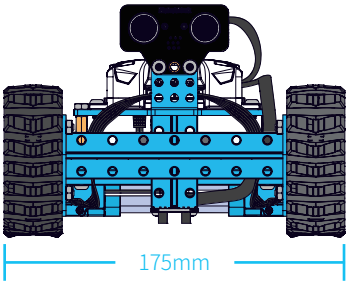
Land Raider



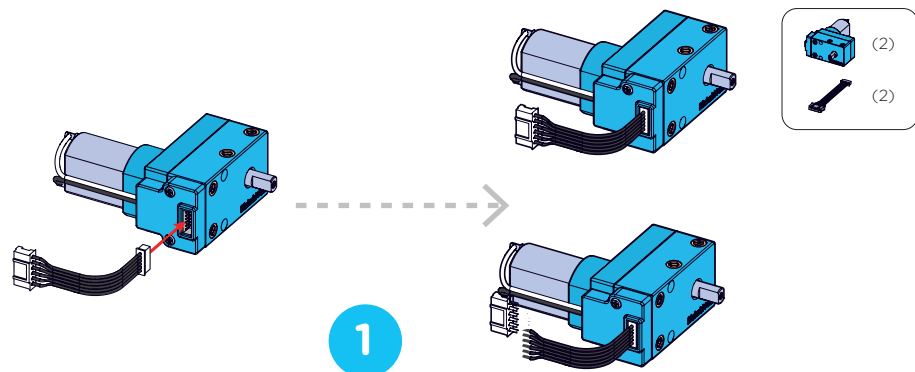
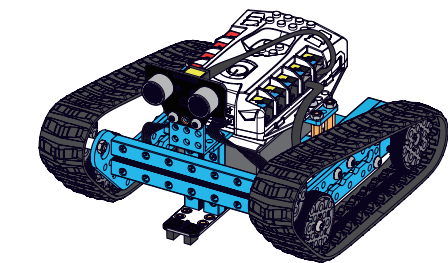
Product description

Land Raider is an all-terrain off-road tank robot which may realize climbing obstacle, obstacle avoidance, intelligent tracking and colorful light and let you feel the excitement of controlling tank to surmount obstacle. What is praiseworthy is that the app can be used to customize the way of playing robot and by simple drag of the graphical programming block, then you can use the self-contained sound sensor, gyroscope, line-follower sensor, light sensor, ultrasonic sensor, LED light and encoder motor and create your own way to play Land Raider!

Product size

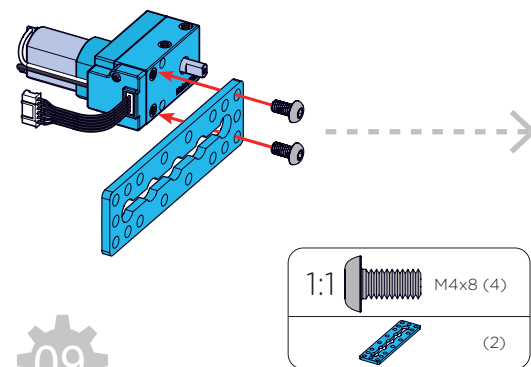


Assemble Land Raider

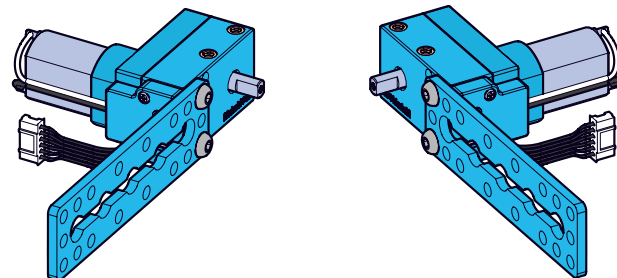


1

2

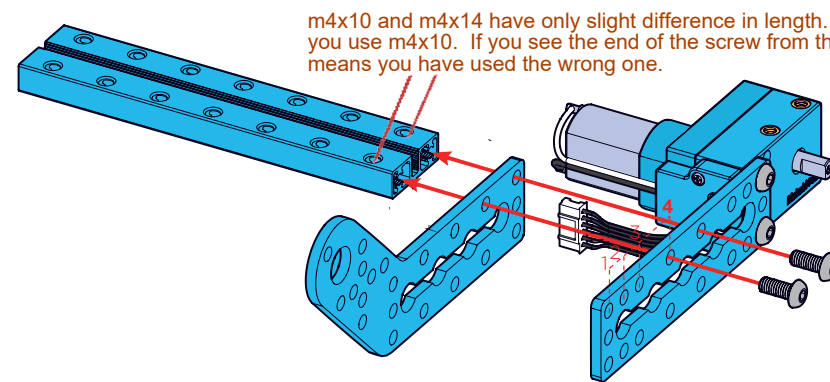


1:1 M4x8 (4)
(2)

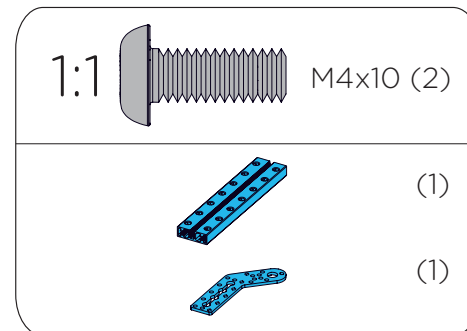


3 !

Take extra caution when you are securing the motors. Should NEVER pull or push the wires. Should NEVER use the motors as a handler .



m4x10 and m4x14 have only slight difference in length. Make sure you use m4x10. If you see the end of the screw from the holes here, it means you have used the wrong one.



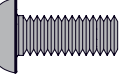
1:1 M4x10 (2)


(1)
(1)

Recommendation:

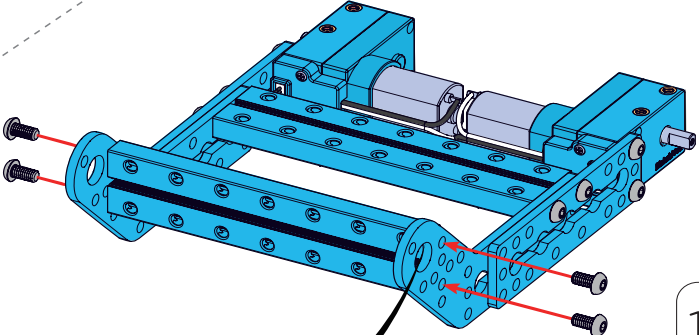
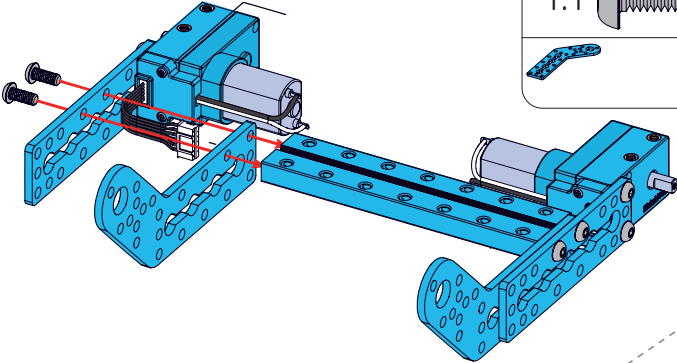
- When you first put the screws into the correct holds, turn just enough allowing the screws to stay in place without falling out. It is not necessary to secure them tight yet.
- After that, compare the image here with what you have put together. After you have confirmed that all screws are in the right holes, you then further secure them tight.

Assemble Land Raider

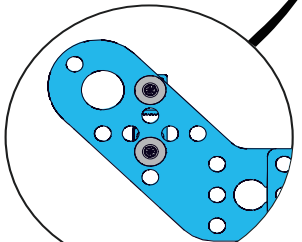
1:1  M4X10 (2)

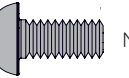
 (1)


4 !



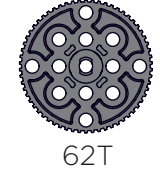
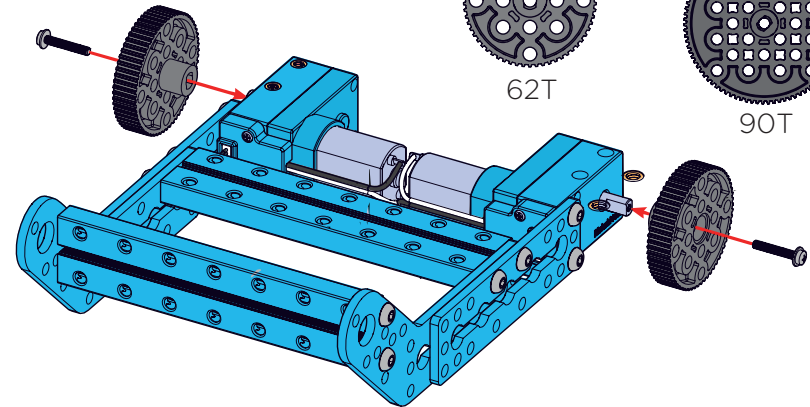
5 !



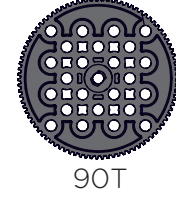
1:1  M4x8 (4)

 (1)


6 !





62T







90T

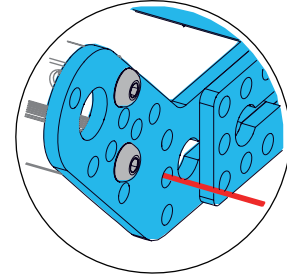
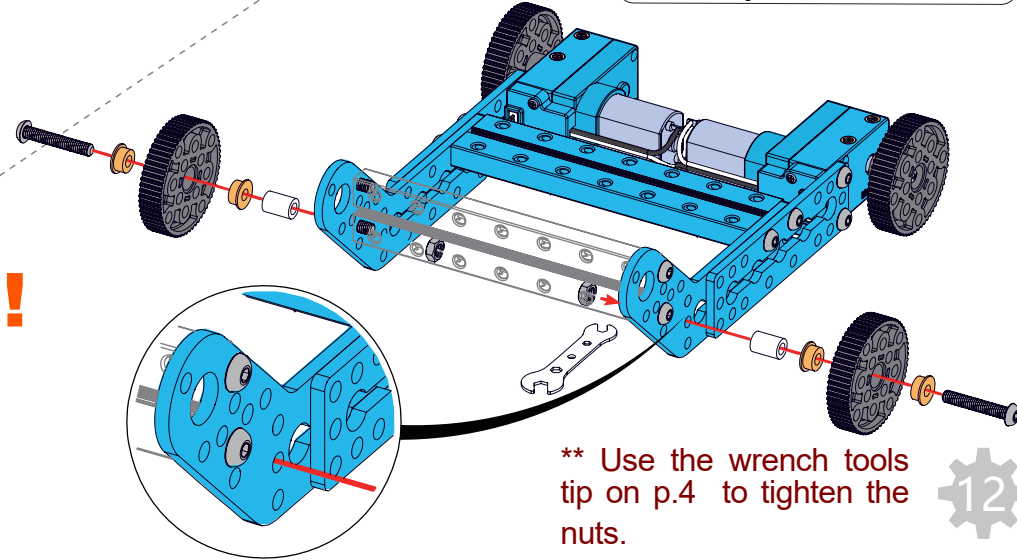
1:1  M2.5X12 (2)

 (2)

1:1  M4X25 (2)

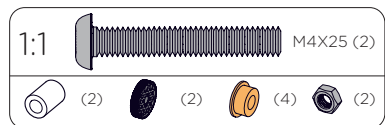
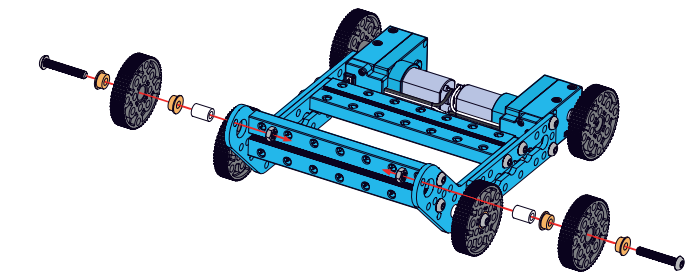
 (2)  (2)  (4)  (2)

7 !



** Use the wrench tools tip on p.4 to tighten the nuts.

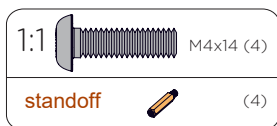
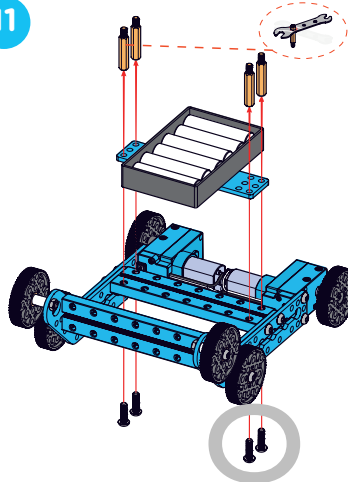
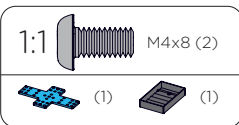
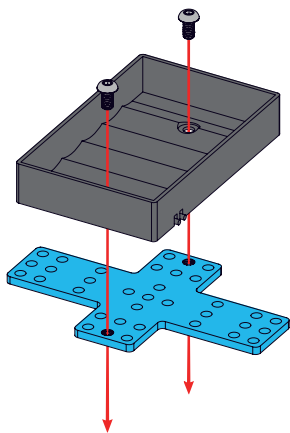




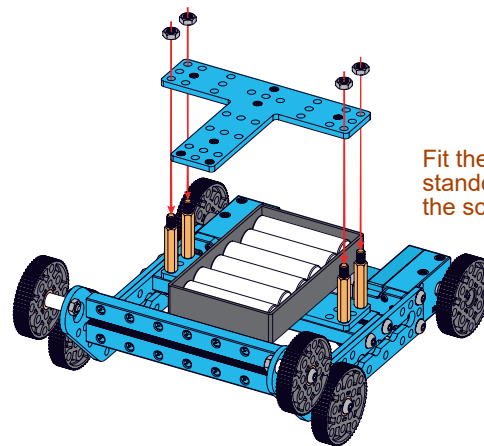
8 9
10 11



*Note: AA batteries are not included in this kit.

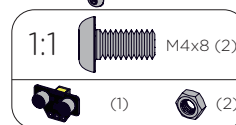
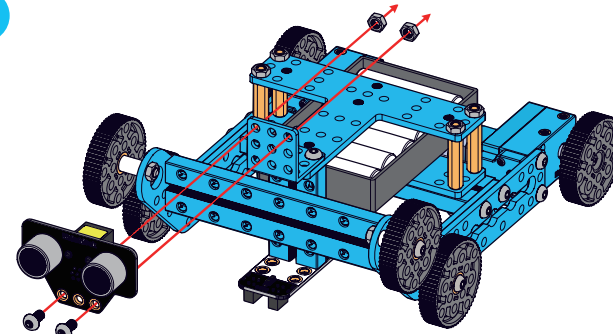
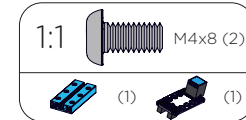
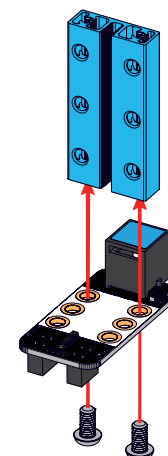
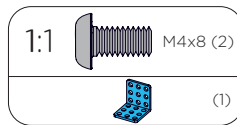
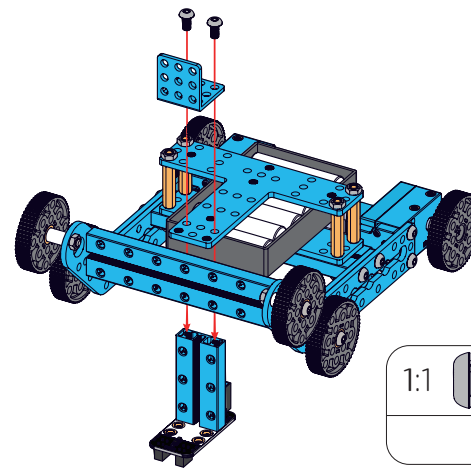


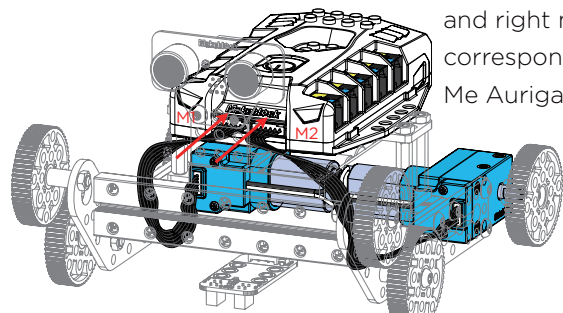
Standoffs should be screwed in, but not completely tightened yet.



Fit the T-plate onto the standoffs, then tighten the screws.

12 13
14 15

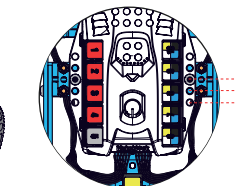
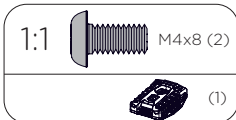
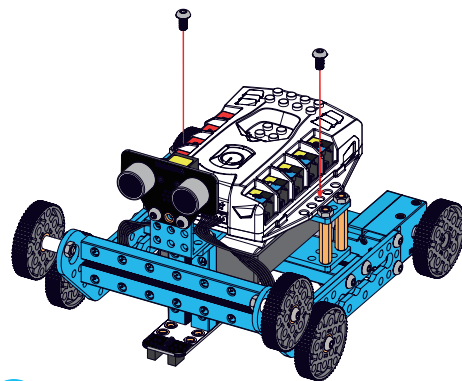




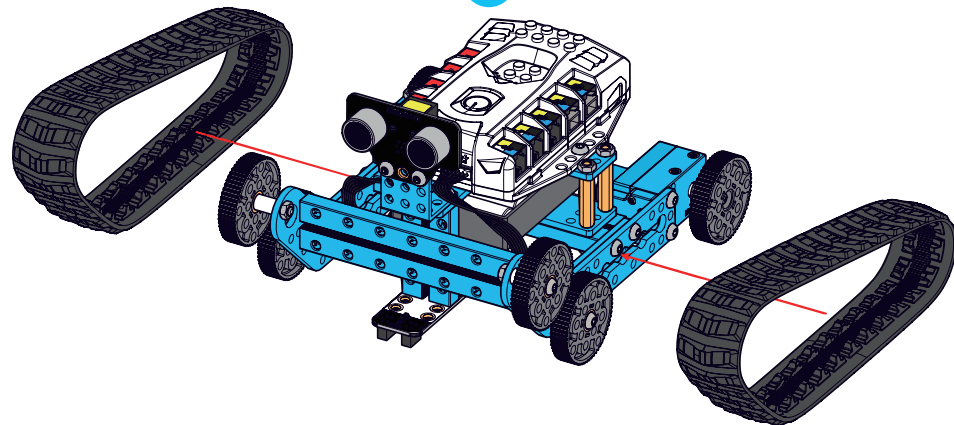
Right motor (M1)

Left motor (M2)

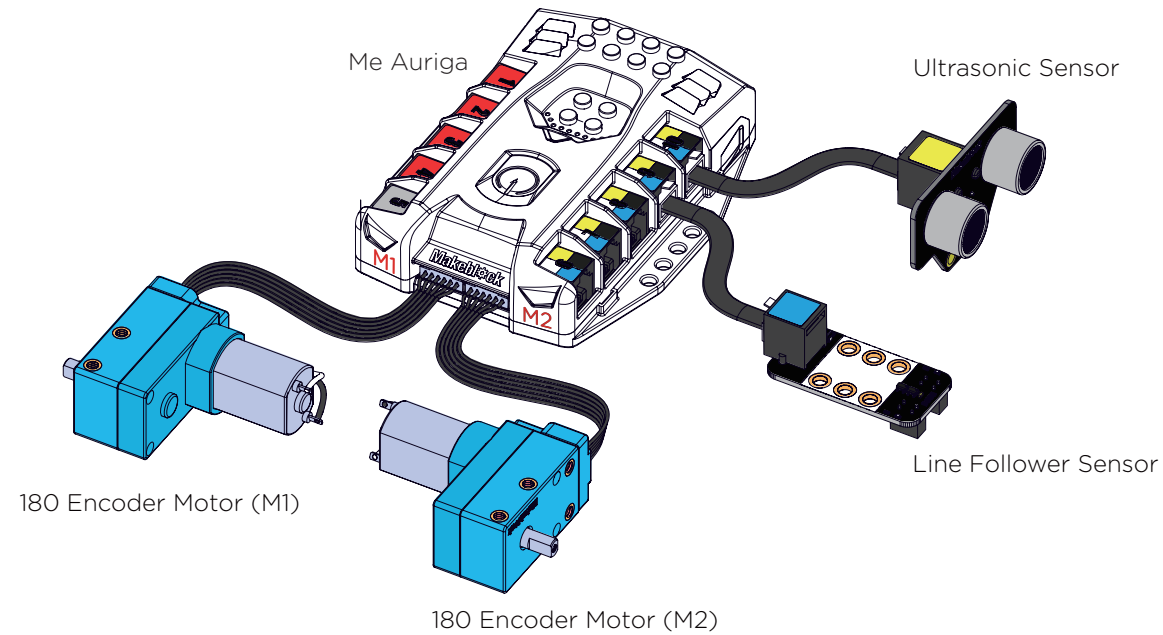
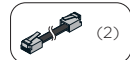
Connect the left motor and right motor to the corresponding port of Me Auriga.



16 17
18

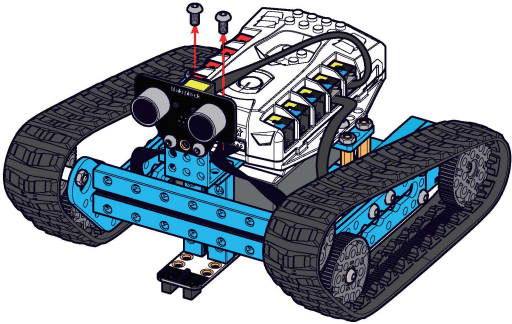


Wiring of Land Raider

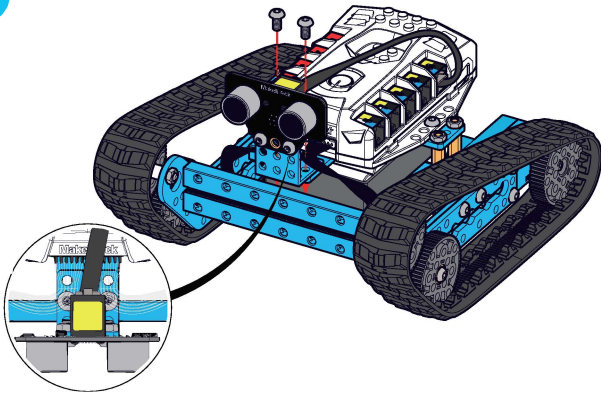
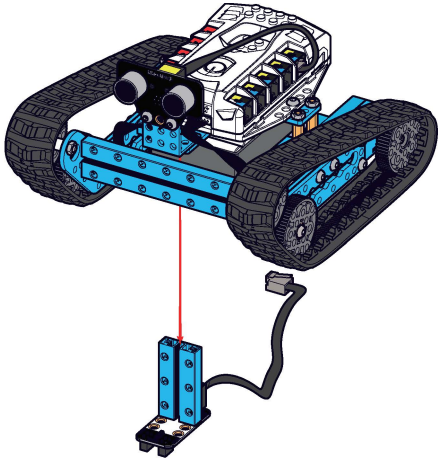


Playing Tips

When you want to play Land Raider on rough terrain, please follow the instruction below to remove the line follower sensor. If not removed, may result in a malfunction or damage to the sensor.



- 1
- 2
- 3

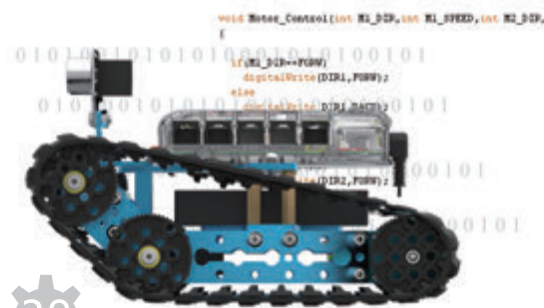


Advanced Learning - Arduino Programming (C Language)

Introduction to Arduino

Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. The Arduino software consists of a development environment (IDE) and the core libraries. The IDE is written in Java and based on the processing development environment.

Know More: <https://www.arduino.cc>
Required System: Windows/Mac/Linux




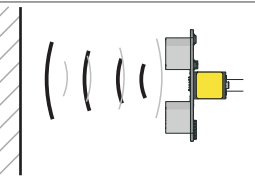




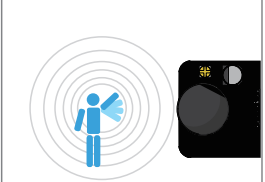
Online Tutorials

This online tutorial is great for beginners who want to learn the basics of writing code while having fun playing with Ranger.

Online Tutorials:

<http://learn.makeblock.com/ranger-arduino-programming/>

Further Exploration - Electronic Modules on Makeblock Platform

	Ultrasonic Sensor measures distances from 3cm to 4m.			Me Sound Sensor measures volume. It could be used in a project that uses a voice operated switch.	
	Me 7-segment Serial Display allows information such as time, speed or scores to be displayed.			Me Temperature Sensor Module measures temperature, ranging from -55C to 125C.	
	Me RGB LED contains 4 programmable lights which can display lots of different colors.			Me Passive IR Detector Module detects infrared signals from humans or animals within 6 meters.	
	Me Joystick can control the movement of a robot or a part of a robot.		See more on Makeblock platform http://www.makeblock.com		