Makeblock
Construct Your Dreams

Makeblock Co., Ltd.
Technical Support: tec-support@makeblock.com
www.makeblock.com

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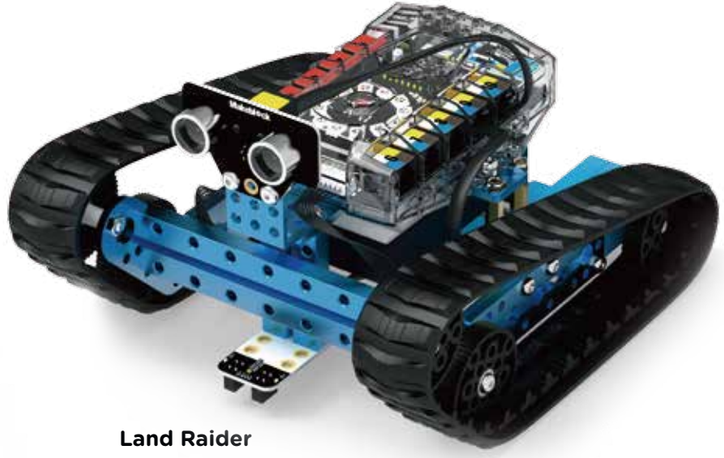
Construct Your Dreams

mBot Ranger

3-in-1 Educational Robot Kit



Land Raider

Nervous Bird

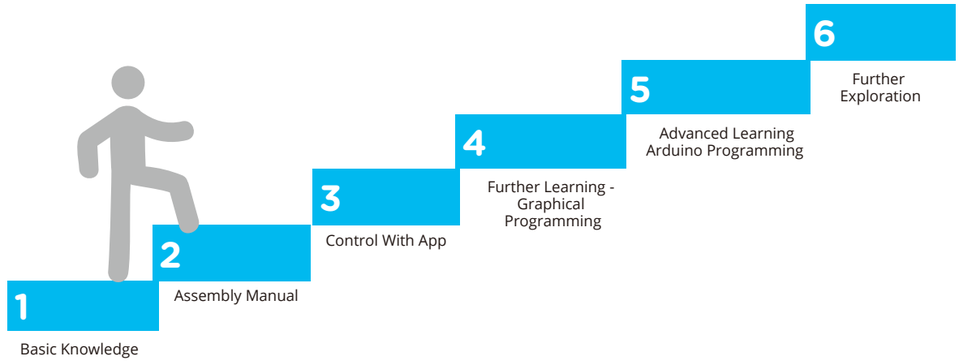
Dashing Raptor

Index

Quick Guide

WARNING:CHOKING HAZARD - Small parts. Children should be accompanied by adults.

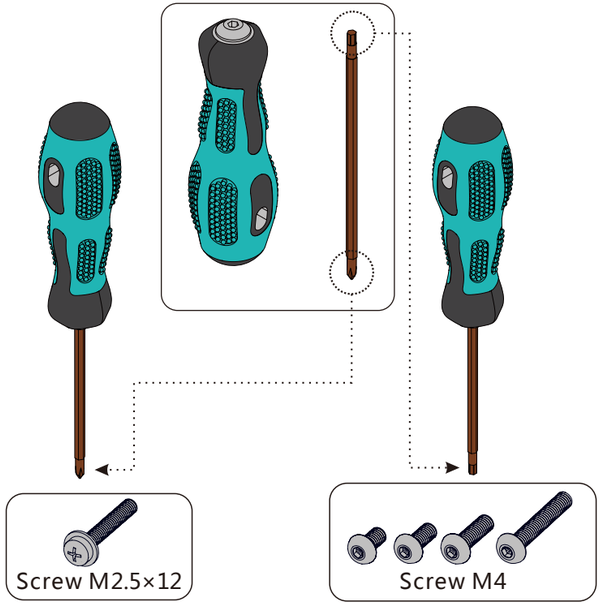
mBot Ranger is a three-in-one STEM educational robot kit which supports three building forms: a robot tank, a three-wheeled racing car, and a self-balance car. Program and control mBot Ranger via smartphone, tablets, or computer to start your exploration in the world of robotics.

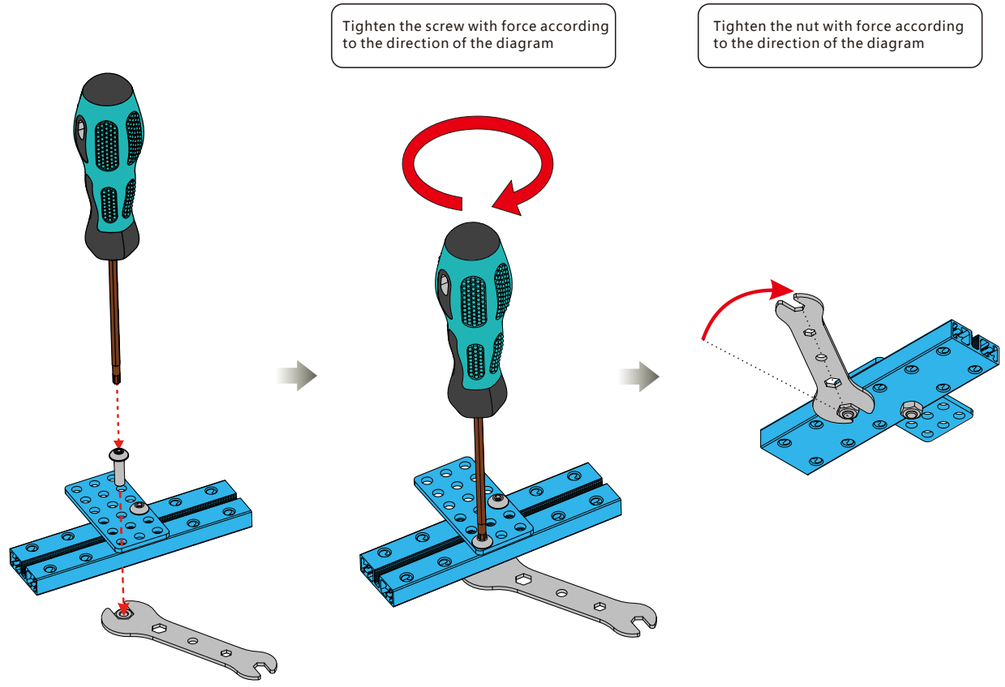


Parts List

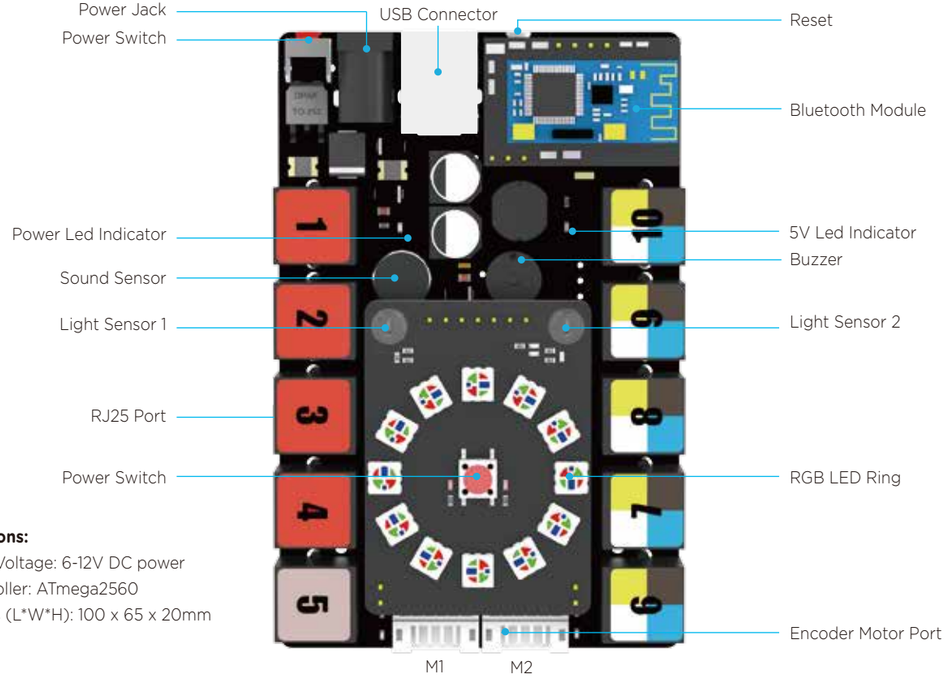
2 x Beam0824-112	2 x 90T Wheel	1 x USB Cable
1 x Beam0824-48	2 x 90T Tyre	2 x RJ25 Cable-20cm
2 x Plate 0324-88	2 x Track	1 x Wrench
2 x Plate 135°	4 x Plastic Spacer 4x7x10mm	1 x Hex & Cross Screwdriver
1 x Plate for Battery Holder	2 x 180 Encoder Motor	22 x Screw M4*8mm
1 x Plate T-type	8 x Copper Bush 4x8x4mm	4 x Screw M4*10mm
1 x Bracket 3x3	4 x Bruss Stud M4*30+6	6 x Screw M4*14mm
1 x Bracket U1	1 x Battery Holder	4 x Screw M4*25mm
1 x Mini Caster Wheel	1 x Me Auriga	2 x Screw M2.5*12mm
4 x 62T Wheel Without Step	1 x Ultrasonic Sensor	10 x Nut M4
2 x 62T Wheel	1 x Line Follower Sensor	2 x Encoder Motor Wire

Introduction to Tools





Me Auriga



Specifications:

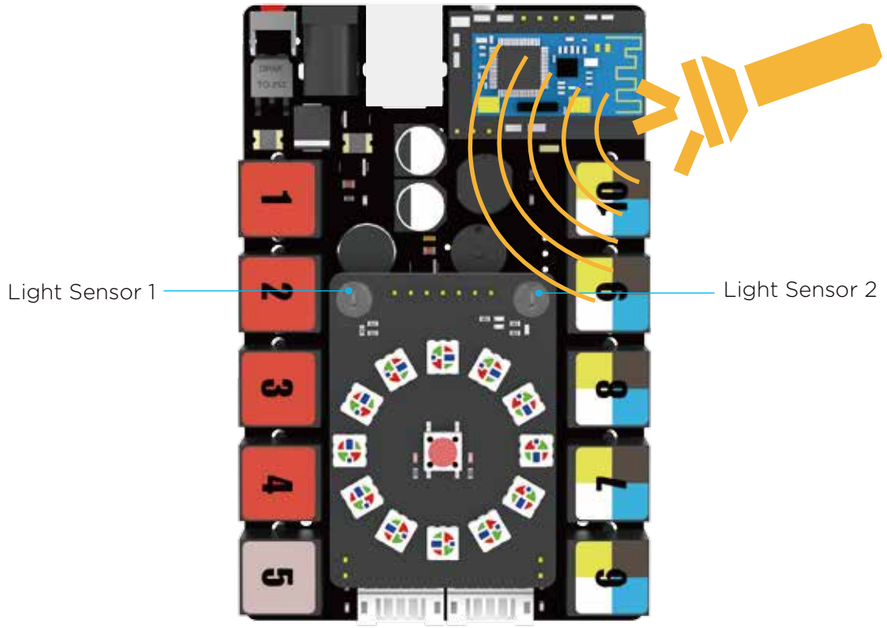
Operating Voltage: 6-12V DC power
Microcontroller: ATmega2560
Dimensions (L*W*H): 100 x 65 x 20mm

Introduction to Interfaces of Me Auriga

Tag Color	Compatible Module Types	Typical Me Modules
1 2 3 4	(6-12V DC) Driven modules	Me Motor Driver Me Servo Driver Me Stepper Driver
5	Hardware serial port	Me Bluetooth Me Bluetooth Module (Dual-Mode)
6 7 8 9 10	One way digital interface Dual digital interface I²C 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 ...

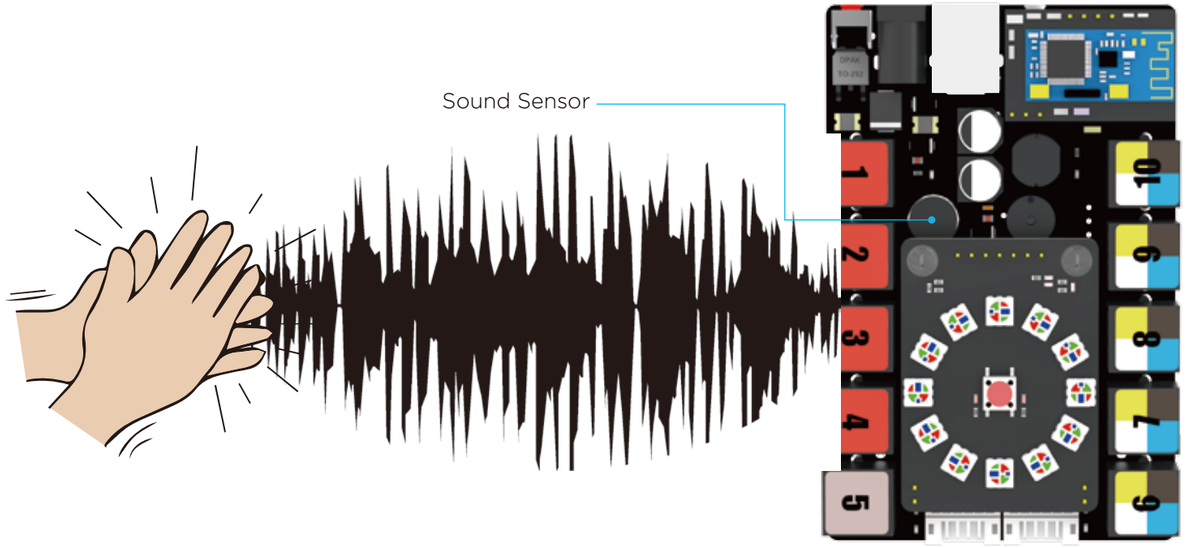
Light Sensor

Me Auriga has two on-board light sensors. Each of Ranger's light sensors can measure how much light is shinning on it. The more light shines on the sensors, the higher the signal it feeds back. Light sensors can be used to make an intelligent dimming lamp, a light-avoiding robot and a light-following robot.



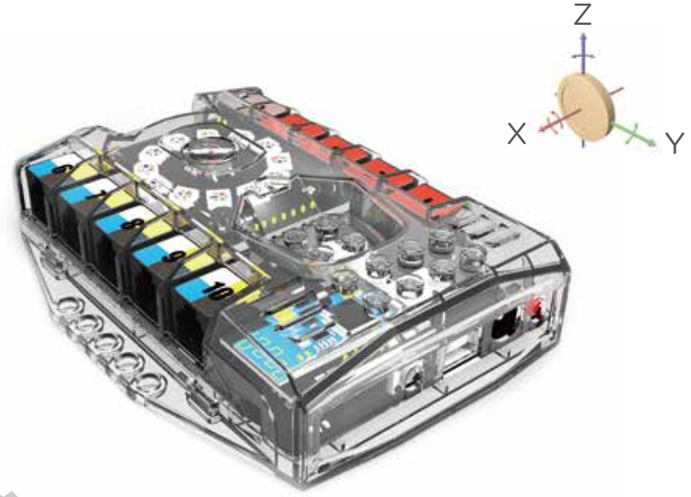
Sound Sensor

The sound sensor on Me Auriga is designed to detect the intensity of sound in the surrounding environment. Based on the LM386 power amplifier and the electret microphone, the sound sensor can output analog values ranging from 0 to 1023. It can be used in sound interactive projects, such as a voice operated switch.



Gyroscope Sensor

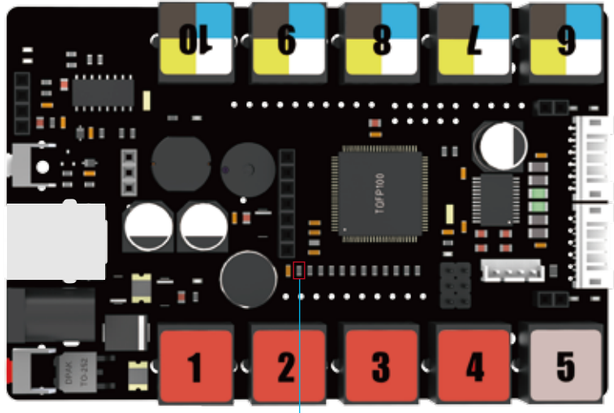
Ranger's on-board gyro sensor is a motion processing module. It measures the angular rate and the acceleration information of your robot. Based on MPU-6050, this gyro sensor combines a 3-axis gyroscope, 3-axis accelerometer, and a Digital Motion Processor™ (DMP) capable of processing complex 9-axis Motion Fusion algorithms. It can be used together with encoder motor to build a self-balance car.



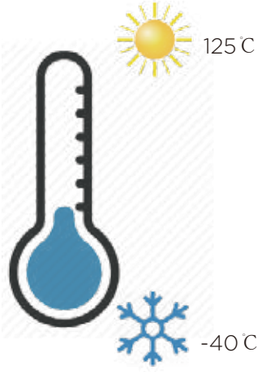
Gyroscope Sensor

Temperature Sensor

The Ranger's on-board temperature sensor contains a tiny thermometer (a NTC thermistor) that detects the temperature of the surroundings.

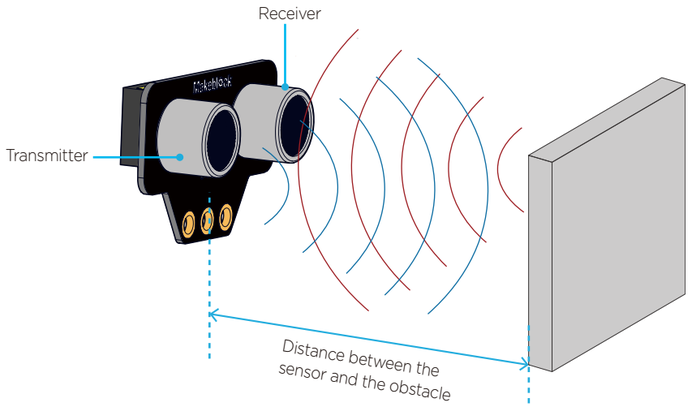


NTC thermistor



Me Ultrasonic Sensor

Me Ultrasonic Sensor is an electronic module that emits an ultrasonic wave and determines the distance between the sensor and an object based on the time it takes to send the signal and receive the echo. Ultrasonic sensors have numerous applications, such as parking assistance sensors in cars and proximity alarms. This Me Ultrasonic Sensor can be attached to the port with yellow tags on Me Auriga.



Specifications:

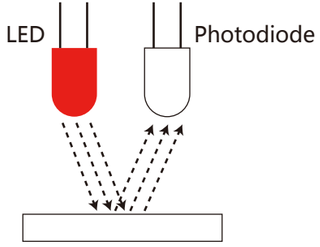
Operating Voltage: 5V DC
Detecting Range: 3cm-400cm
Detecting Angle: Prefer at 30 degree angle
Dimension (L*W*H): 56 x 36 x 31mm

Me Line Follower Sensor

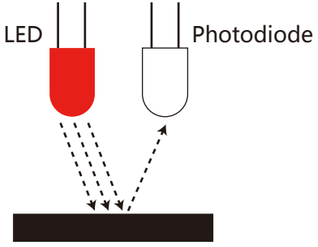
Me Line Follower module is designed for giving the robot the ability to detect lines or nearby objects. It has two sensors on the module and each sensor contains two parts - an IR emitting LED and an IR sensitive phototransistor. By measuring the amount of reflected infrared light, it can detect transitions from light to dark (lines) or even objects directly in front of it. This module can be connected to the port with blue tags on Me Auriga.

Specifications:

Operating Voltage: 5V DC
Detecting Range: 1-2cm
Dimension (L*W*H): 48 x 24 x 24mm



White surfaces reflect lots of infrared light back to the sensor.



But not much light reflects from black surfaces to the 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 recommanded.
We recommand 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.

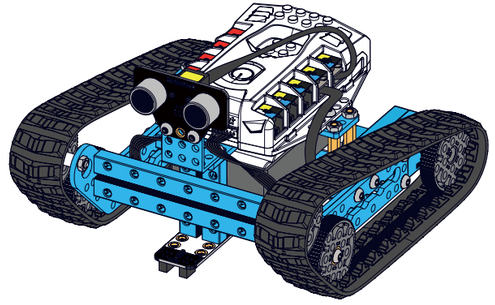
LOW BATTERY INDICATORS:

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.

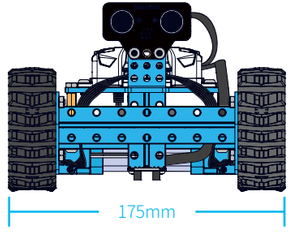
Land Raider

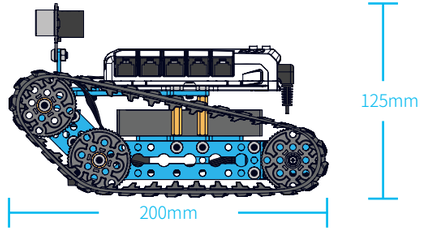


Product description

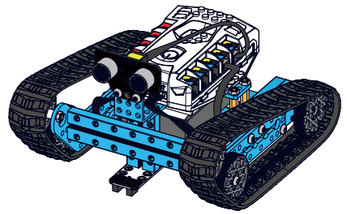
Land Raider is an all-terrain off-road tank robot which may realize climbing obstacle, obstacle avoidance, intelligent tracking and colorful light and let you feel the excitement of controlling tank to surmount obstacle. What is praiseworthy is that the app can be used to customize the way of playing 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!

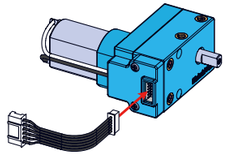
Product size

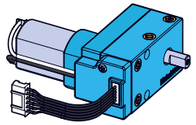


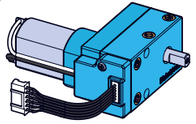


Assemble Land Raider









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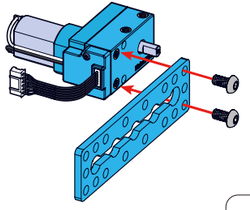

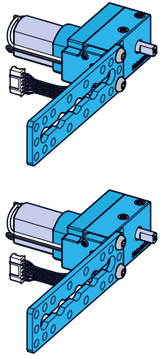

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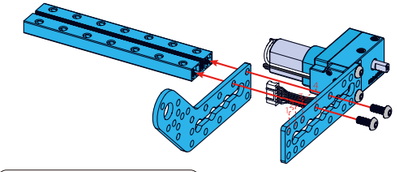

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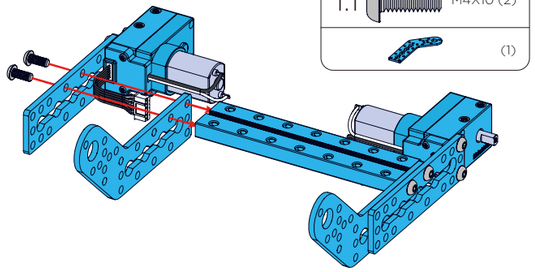
(1)



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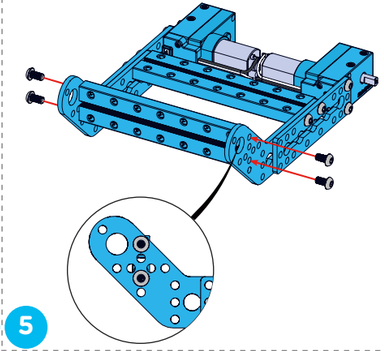

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(1)

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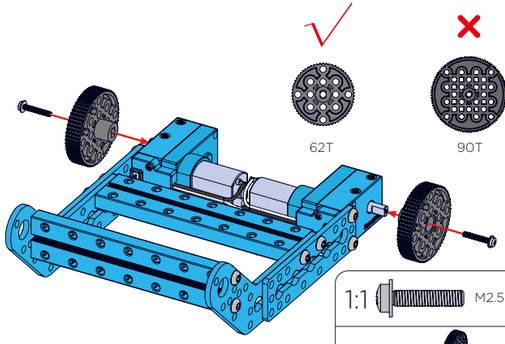

62T

90T

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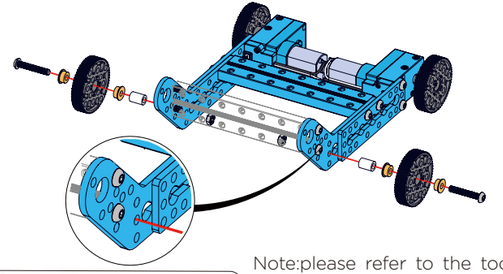
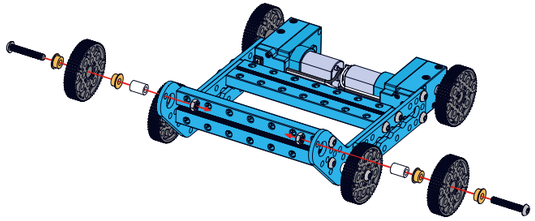
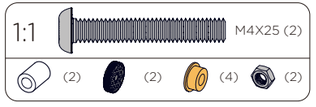


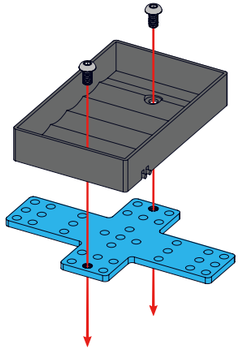
1:1 M4X25 (2)

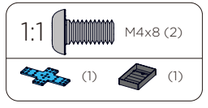
(2) (2) (4) (2)

Note:please refer to the tool tips in page 5 and use wrench to tighten the nuts.









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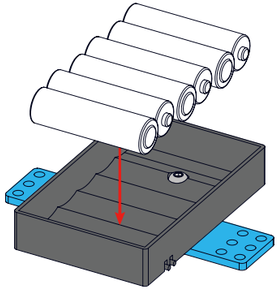
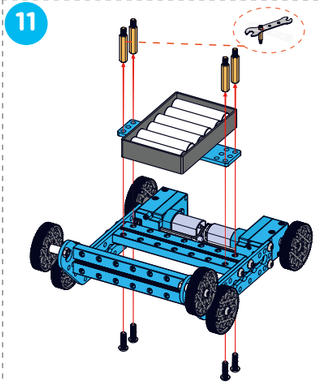
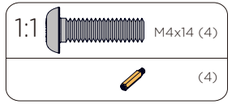
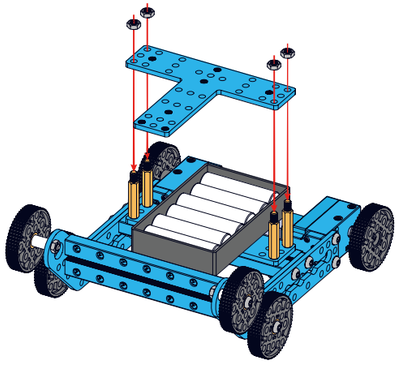
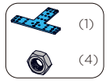






*Note: AA batteries are not included in this kit.





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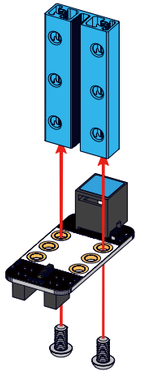
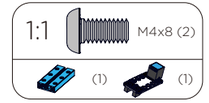
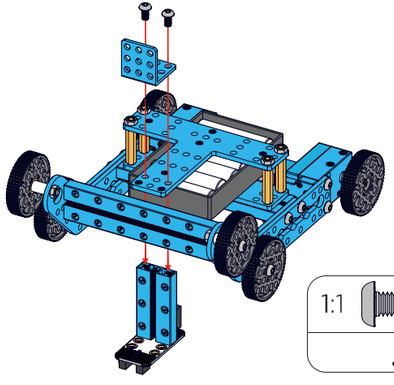
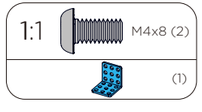
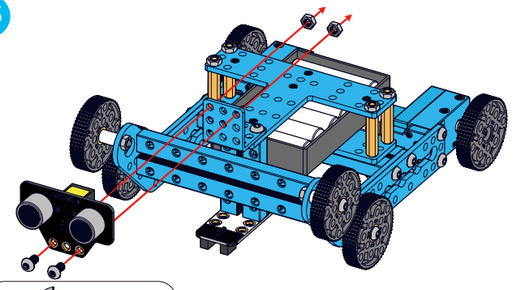
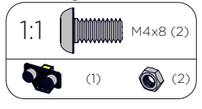


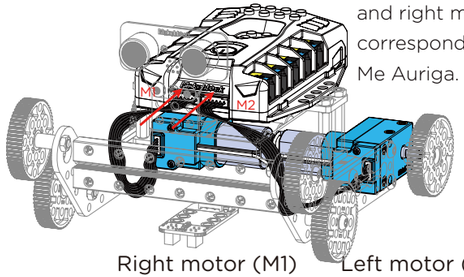






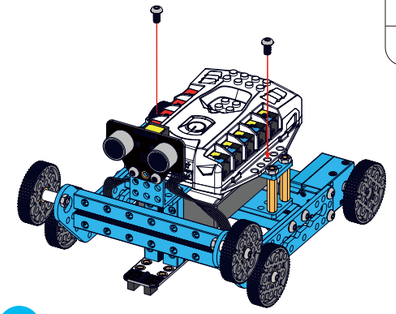


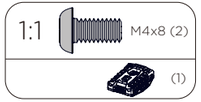


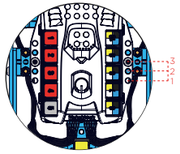


Connect the left motor and right motor to the corresponding port of Me Auriga.

Right motor (M1) Left motor (M2)

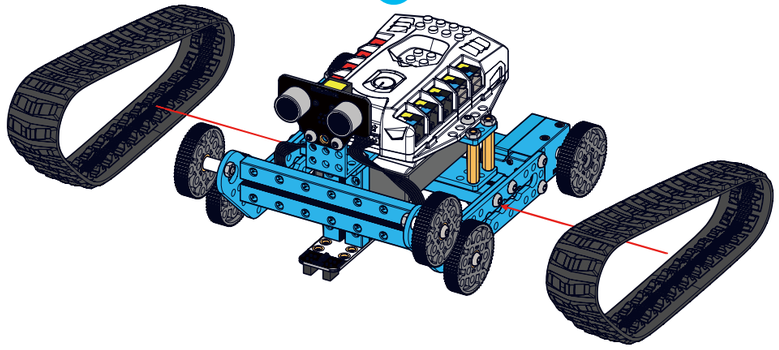




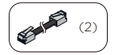


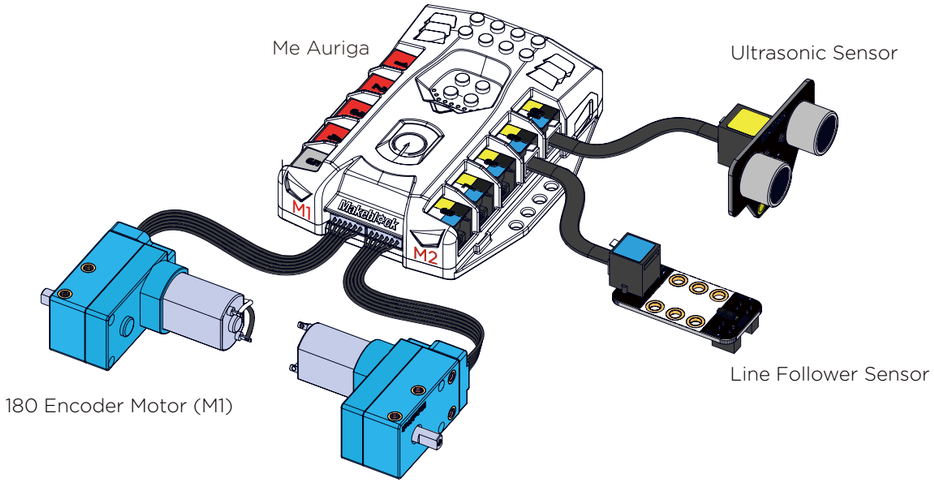
16 17

18



Wiring of Land Raider





Please follow page 36 for controlling with App