AlphaBot, Basic robot building kit for Arduino

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Part Number: AlphaBot-Ar-Basic (EN)
Brand: Waveshare

Basic robot building kit for Arduino: UNO PLUS + AlphaBot + Ultrasonic Sensor

This product is developed, manufactured, and tech supported by Waveshare.

Package Content

AlphaBot Standard

Note: this product requires two 18650 batteries to work, which are NOT included and should be purchased separately.

1. AlphaBot mainboard x1
2. Tracker Sensor x1
3. Photo Interrupter Sensor x2
4. Infrared Proximity Sensor x2
5. Motor with gearbox 2PCS x1
6. AlphaBot wheel 2PCS x1
7. AlphaBot acrylic chassis x1
8. Motor mounting plate 4PCS x1
9. omni-direction wheel x1
10. 20-slots encoder disk 2PCS x1
11. IR remote controller x1

12. XH2.54 4cm 4Pin 2PCS x1
13. XH2.54 4cm 3Pin 2PCS x1
14. XH2.54 4cm 7Pin x1
15. AlphaBot screws x1


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Additional Parts in the Kit

1. UNO PLUS x1
2. Ultrasonic sensor x1
3. SG90 servo x1
4. Ultrasonic sensor adapter x1
5. Servo mounting plate x1
6. XH2.54 20cm 4PIN x1
7. USB type A plug to micro B plug cable x1


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Overview

This kit comes with controller board UNO PLUS, AlphaBot robotic platform (line tracking, obstacle avoidance, speed measuring, IR control), and ultrasonic sensor.

While utilizing UNO PLUS as controller board, this kit is based on the Arduino software/hardware open source platform. Combined with the modular design, it's an ideal platform to get started with Arduino robot.

UNO PLUS Features

UNO PLUS is a development board compatible with the Arduino UNO R3, an improved & enhanced alternative solution for Arduino UNO R3.

UNO PLUS Vs UNO R3：

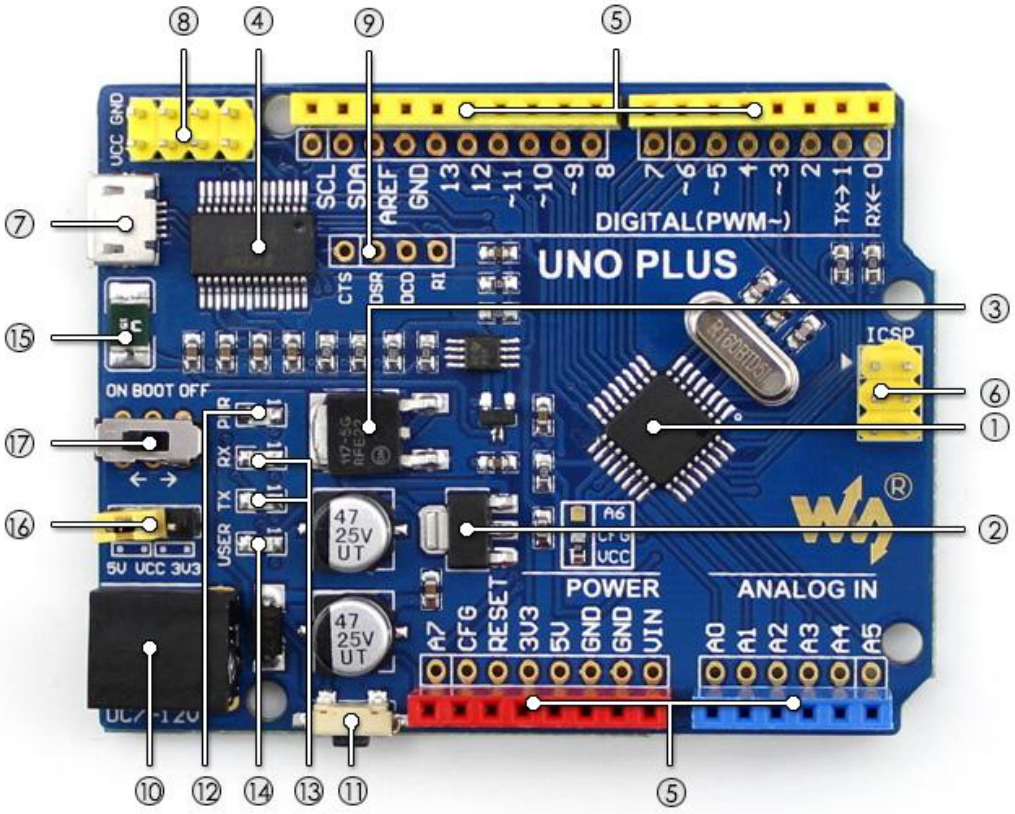
	UNO PLUS	UNO R3	Remarks
Operating voltage	5V/3.3V	5V	Dual voltage level to support more shields
Reset	Lateral	Vertical	Lateral button is easier to use when connecting with shield
Bootloader switch	Yes	None	The board can be configured to run program immediately when power-up by the switch
USB connector	Micro USB	USB Type B	Micro connector is more commonly used, and shields won't be blocked anymore while connecting
DC jack	Low profile	Normal height	Shields won't be blocked anymore while connecting
Power output header	Yes	None	Providing 5V/3.3V power output OR common-grounding with other boards
3.3V power output	800mA Max	150mA Max	UNO PLUS features higher driving capability
Oscillator	Crystal oscillator	Ceramic resonator	Crystal oscillator is suit for applications where accurate clock reference is required
ADC channel	8	6	CFG used as ADC6 by configuration, and ADC7 from the Reserved PIN
Connecting with prototype breadboard	Supported	Not supported	Solder pads is provided for DIY interfaces to connecting with prototype breadboard
USB driver	Compatible with all main systems	Doesn't compatible with WIN7/WIN8 Express Edition	Driver will never failed to install thanks to the onboard FT232

Firmware fixing	Supported	Not supported	Firmware can be fixed by using the onboard FT232, no extra programmer is needed

AlphaBot Features

- Raspberry Pi/Arduino interfaces, works with either one separately, or both
- Arduino extend header, supports Arduino shields
- Modular design, plug-and-play modules like line tracking, obstacle avoidance, speed measuring, etc. eliminating the trouble of connecting mess wires.
- LM298P motor driver with diode protection circuit, more safety
- LM2596 voltage regular, provides stable 5V power to the Raspberry Pi/Arduino
- TLC1543 AD acquisition chip, allows the Pi to use analog sensors

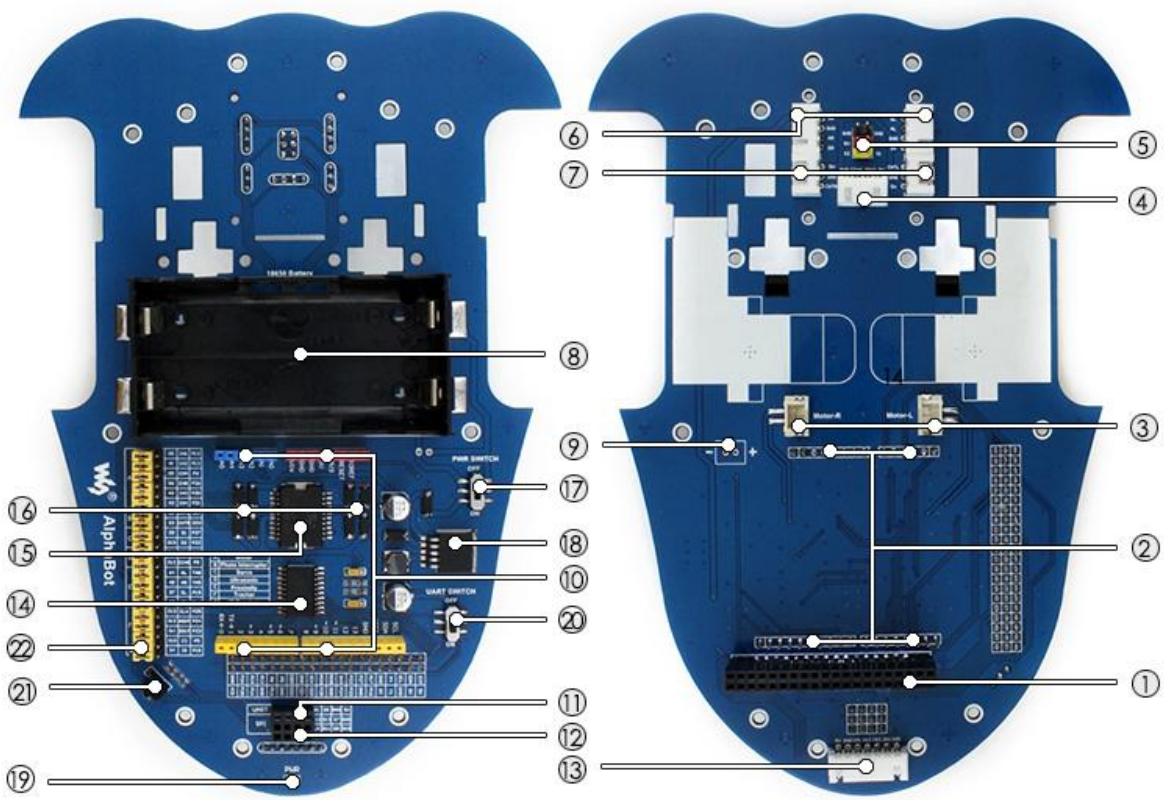
What's on the UNO PLUS



1. ATMEGA328P-AU
2. AMS1117-3.3 : 3.3V voltage regulator
3. NCP1117ST50T3G : 5V voltage regulator
4. FT232RL : USB to UART convertor
5. Arduino interface
    - compatible with standard Arduino interface with two additional analog inputs A6 (config the CFG), A7
    - solder pads provided, supports prototype breadboard
6. ICSP interface
7. MICRO USB connector : for uploading program OR serial port debugging

8. Power output header : 3.3V OR 5V, voltage level configured by the onboard power configuration switch, used as power output OR common-grounding with other boards
9. FT232 pins : for burning Bootloader into the microcontroller
10. DC input : 7V ~ 12V
11. Reset button
12. Power indicator
13. Serial port Rx/Tx indicator
14. User LED
15. Power configuration switch : for configuring the operating voltage
16. Bootloader selection switch
    - turn ON : the board will reset when power-up OR other USB devices were detected connecting to the PC
    - turn OFF : the onboard program runs immediately when power-up, and the board will not reset when other USB devices were detected connecting to the PC

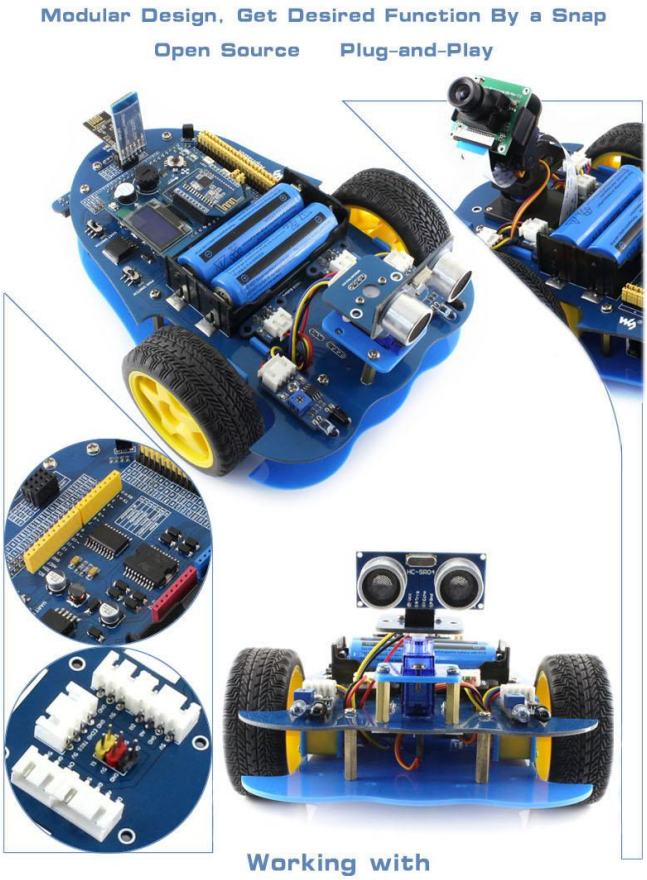
What's on the AlphaBot Mainboard



1. **Raspberry Pi interface:** for connecting Raspberry Pi
2. **Arduino interface:** for connecting Arduino
3. **Motor interface**
4. **Ultrasonic module interface**
5. **Servo module interface**
6. **Obstacle avoidance module interface**
7. **Speed measuring interface**
8. **Battery holder:** supports 18650 batteries
9. **Reserved power input (not soldered):** for connecting other external power supply
10. **Arduino expansion header:** for connecting Arduino shields

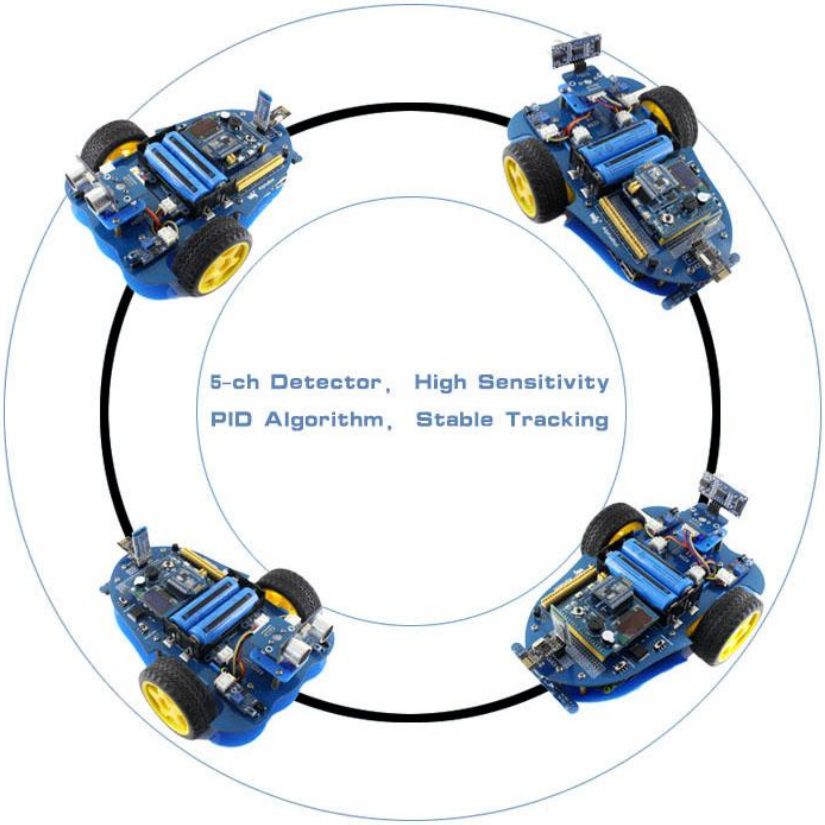
11. **UART interface:** for connecting Bluetooth module, to control the robot remotely via Bluetooth
12. **SPI interface:** for connecting NRF24L01 wireless module
13. **Line tracking module interface**
14. **TLC1543:** 10-bit AD acquisition chip, allows the Pi to use analog sensors
15. **LM298P:** dual H bridge motor driver chip, up to 2A current
16. **Anti-reverse diode**
17. **Power switch**
18. **LM2596:** 5V regulator
19. **Power indicator**
20. **UART switch:** turn on to enable serial communication between Raspberry Pi and Arduino
21. **IR receiver:** control the robot remotely via infrared
22. **Raspberry Pi/Arduino selection:** select the Raspberry Pi or Arduino to control the robot peripherals

Photos


Modular Design, Get Desired Function By a Snap
Open Source Plug-and-Play
Working with
Raspberry Pi/Arduino Separately
or Both

Infrared Line Tracking

= Raspberry Pi | Arduino + AlphaBot Chassis + Tracker Sensor

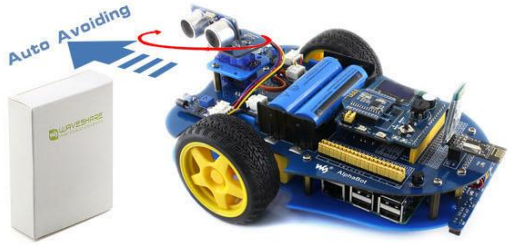


Infrared Obstacle Avoidance

= Raspberry Pi | Arduino + AlphaBot Chassis + Infrared Proximity Sensor x 2

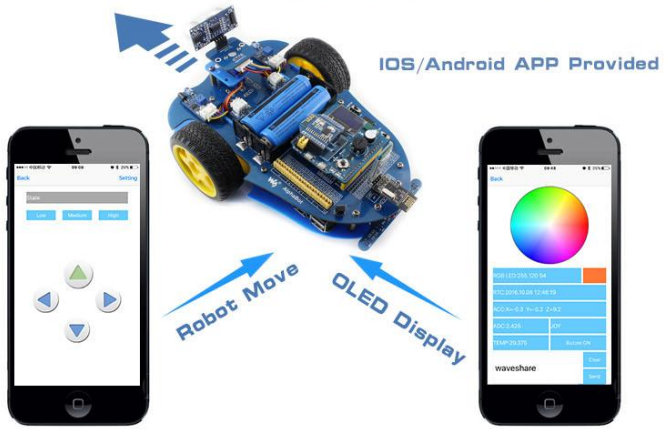
Ultrasonic Obstacle Avoidance

= Raspberry Pi | Arduino + AlphaBot Chassis + Ultrasonic Sensor + Servo



Bluetooth Remote Control

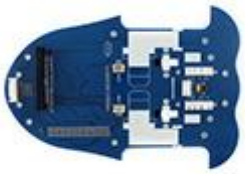
= Arduino + AlphaBot Chassis + Arduino Shield + Dual-mode Bluetooth



Video Monitoring Robot

= Raspberry Pi + AlphaBot Chassis + Servo+Pan Head + Camera

AlphaBot mainboard



AlphaBot mainboard back view

AlphaBot mainboard

AlphaBot mainboard back view

AlphaBot mobile robot

AlphaBot mobile robot back view

AlphaBot mobile robot

AlphaBot mobile robot

AlphaBot multi-function robot

AlphaBot multi-function robot

AlphaBot multi-function robot

AlphaBot multi-function robot

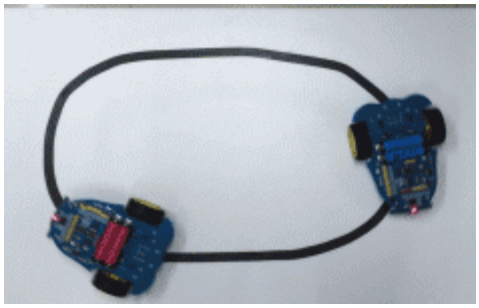
AlphaBot + Raspberry Pi

AlphaBot-Pi Raspberry Pi robot

AlphaBot-Pi Raspberry Pi robot

AlphaBot-Pi Raspberry Pi robot

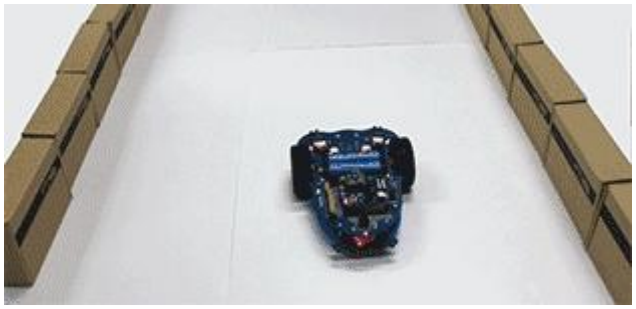
Examples



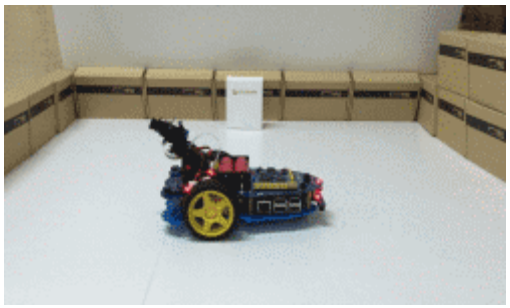
Infrared line tracking robot

Infrared obstacle avoidance robot

Ultrasonic obstacle avoidance robot



Infrared/Bluetooth remote control robot



Video monitoring robot

Note: photos are FOR REFERENCE ONLY, the other boards/modules/accessories are NOT included in the price.

Development Resources

Wiki : www.waveshare.com/wiki/AlphaBot

Wiki : www.waveshare.com/wiki/UNO_PLUS