



# **User's Manual**

**Autonomous Mobile Robot**

**Model: Scout**

# 1. Safety Instructions

**READ AND SAVE THESE INSTRUCTIONS. This product is fully compliant with all relevant electromagnetic field standards and is when handled as described in this manual, safe to use. Therefore, always read the instructions in this manual carefully before using the device, and save it for later use.**

- Scout is not a toy. Do not allow children to play with it without parental care.
- Scout is for indoor usage only.
- Keep this manual for future reference.
- Use of other 2.4GHz and 5GHz products, such as other wireless networks, Bluetooth systems, or microwave ovens may cause interference with this product. Keep Scout away from these types of products, or turn them off if they appear to be causing interference.
- Always ensure that you have a good Wi-Fi connection available.

## 2. What's in the box?

- ✓ Scout Robot
- ✓ Charging Station (recommend to tape to ground)
- ✓ Type-C USB cable
- ✓ Quick Start Guide
- ✓ Lubricant for Mecanum wheels

### **Important note:**

- ◆ **Scout package doesn't provide a power adapter. It is recommended to use a USB adapter with 5V and >2A output. Some fast charging adapters with Type C output require a handshake. Those are not suitable for Scout.**
- ◆ **Place the Charging Station in good lighting condition. Not recommended to affix the Charging Station to the wood floor with paint.**

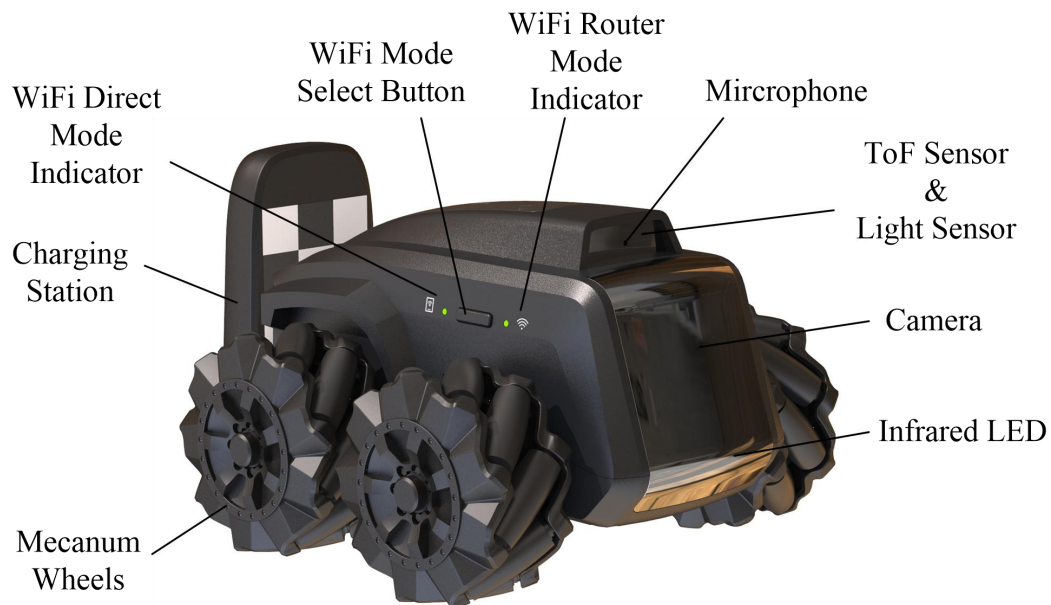
## 3. What can Scout do?

- **Monitoring.** Scout is a smart robot with an FHD camera on wheels. Once connected, the App can control Scout to move around. Night vision is supported. Scout by default recognizes many objects including human bodies and pets.
- **Record videos and take pictures on demand.** Use the "Moorebot Scout" App or send commands

from Amazon Alexa or Google Home, videos and pictures can be recorded. Cloud service is also available.

- **Patrol.** Scout is capable of patrolling the house on its own. Set up the patrol path in the App as well as the triggers such as the timer, sound, sensors, and events from the smart home system, etc. During the autonomous patrols, Scout can avoid obstacles on the way, calculate its path and go back to its Charging Station once done. Scout may have difficulties navigating in a narrow and/or crowded environment with many obstacles.
- **Programming and add-on tools.** Scratch language is supported in the App. Learning programming becomes easy. Users can also design new extension tools for Scout and add on to the extension port. Explore the endless possibilities. For more details, please refer to information on [www.moorebot.com](http://www.moorebot.com).

## 4. Product Overview



## 5. Place the Charging Station

Scout is charged by its own Charging Station. Affix the Charging Station to the floor or against the wall using the supplied adhesive tape. To support autonomous patrol, it is important to make sure that the Charging Station does NOT move around. Provide power via USB port. Scout is capable of identifying its Charging Station within 6 ft range and backing into it. Make sure that the Charging Station is placed under good lighting

conditions. During the night, Scout relies on its own IR light source. The Battery Indicator reflects the charging status.

Several tasks can only be performed when Scout is in the Charging Station. These include software OTA (over-the-air) update, BIST (built-in-self-test), the start of patrol, monitoring with motion detect, and reboot.

Avoid heat sources or other battery-unfriendly conditions to place the Charging Station.

## 6. Powering Scout On & Off

Press the "On & OFF" button for 2 seconds until the Power LED lights up. The system boots up. Press and hold the button for 3 seconds to turn it off.

When Scout is turned off and is placed in the Charging Station, the bot automatically boots up.

### **Important note:**

- ◆ **Features that require Scout to boot up, such as OTA (Over-the-Air) update are better to have the bot in the Charging Station. Otherwise, users must manually power up the bot again.**

## 7. Reset

To reset the robot, long-press the “RESET” at the rear of the robot for >8 seconds. The robot restores the factory condition and turns it off. This resets the password and unbinds the robot from the previous user account.

## 8. Recovery

Recovery restores the factory settings including the operating systems. Once recovery is performed, users need to OTA update the firmware to the latest version again. To perform recovery, press both “RESET” and the “POWER” buttons simultaneously for >3 seconds. The LED indicators blink for several minutes until the robot shuts down. Manually power up the robot again. The LED indicators blink for several minutes again. When the blink stops, the recovery is complete.

## 9. Connecting Scout

What you need:

- Smartphone or tablet with Android OS 6.0 and later or iOS 11.0 and later. The smartphone shall support the 5GHz band of the Wi-Fi.
- Wireless network (for Wi-Fi Router mode)

## **9.1 Download Scout App**

### **For Android devices**

Go to Google Play Store, search for “Moorebot Scout”, then download and install the App on your Android device.

### **For iOS devices**

Go to App Store, search for “Moorebot Scout”, then download and install the App on your iOS device.

## **9.2 Connect to Scout**

There are two ways that a mobile phone can connect to Scout, Wi-Fi Direct Mode (or AP mode) and Wi-Fi Router Mode. Out of the factory, the Wi-Fi on Scout is set to the Wi-Fi Direct Mode. Only after home Wi-Fi router information is set, users can press the Wi-Fi button to select between the Wi-Fi direct mode and the Wi-Fi router mode.



*It is recommended to do a reset first before setting up the Wi-Fi connection.*

In the Wi-Fi Direct Mode, mobile phones link to Scout directly. Users can see in the mobile phone a Wi-Fi named "**robot\_scout\_XXXXXX**". Follow the App and use the default password (e.g. "**r0123456**") to connect. Once connected to Scout, users shall control the robot and view the video.

The second mode is Wi-Fi Router mode. Follow the App, select your home Wi-Fi router SSID, and enter the password. If the robot connects to your home Wi-Fi router successfully, it produces a sound alert and switches to the Wi-Fi router mode automatically, and goes online. In this mode, the robot becomes an Internet-of-Things (IoT) device and can be accessed from the internet via a secured Peer-to-Peer connection. In the Wi-Fi router mode, when the Wi-Fi LED indicator blinks, it indicates that the robot is not connected. When the LED indicator stays on, it indicates that the robot is connected.

Press the "Wi-Fi mode select button" to change between the two Wi-Fi modes.

**Important note:**

**Scout is optimized to rely on the 5GHz band of the Wi-Fi. 5GHz has higher bandwidth but it is more line-in-sight. 2.4GHz band may have better area coverage. For iOS users, make sure the "local access" of the Scout App is granted. Otherwise, the OS doesn't allow Wi-Fi Direct connection.**

## 10. Get started with Scout

### 10.1 Overview of Scout App

Moorebot Scout App allows users to connect the robot to mobile phones either directly or through the internet. Users can control the robot's movement and view its video with different resolutions (e.g. 720P/1080P). Scout, when it is in its Charging Station, can become a standard IP camera or monitor. It supports motion detect, and many other IP cameras features.

Patrol paths can be set up for Scout to autonomously conduct patrol with different triggers, such as the timer, voice control through Alexa or Google Home, even sensors in your smart home system. Scout can generate a report and send a notice after each patrol. If human bodies or pets are detected, a 13-second video

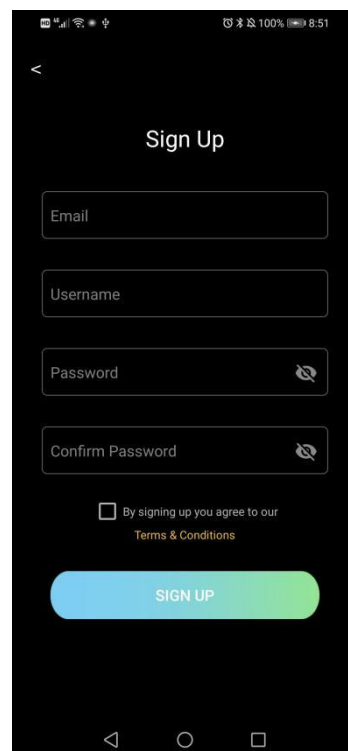
clip can be uploaded to the cloud server. The cloud server can be disabled on the setup page.

Moorebot Scout App also supports Scratch Programming. Users can program and control the robot with this graphical programming interface.

### **10.1.1 Register and Set up Wi-Fi**

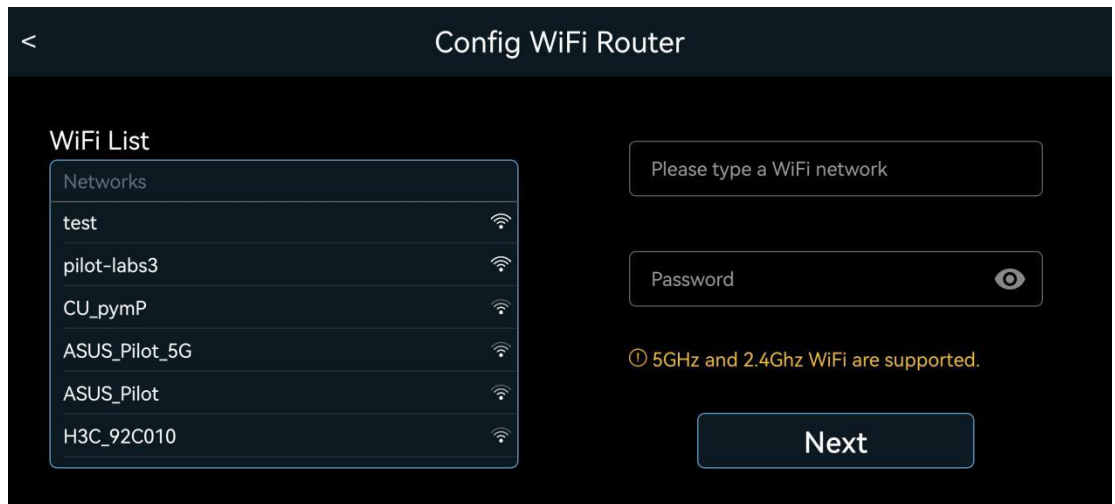
Users need to register an account with the correct email. Depending on your email security setting, sometimes the confirmation email may go to your spam folder. You can whitelist emails from:

**Moorebot-noreply@mail.moorebot.com**

A screenshot of the Moorebot Scout App's 'Sign Up' screen. The screen has a black background with white text. At the top, there's a back arrow icon and the title 'Sign Up'. Below the title are four input fields: 'Email', 'Username', 'Password', and 'Confirm Password'. Each field has a small icon on the right side, likely for toggling visibility. Below the input fields is a checkbox with the text 'By signing up you agree to our Terms & Conditions'. At the bottom, there is a large, rounded rectangular button with a blue-to-green gradient and the text 'SIGN UP' in white. The bottom of the screen shows the Android navigation bar with back, home, and recent apps icons.

Once registered, the next step is to set up Wi-Fi.

Turn on the robot. After it powers up, the Wi-Fi shall stay in the "Wi-Fi Direct" Mode, which is the out-of-factory condition. Scan Wi-Fi around you. There should be Wi-Fi with the SSID name "**robot\_scout\_XXXXXX**". This is Scout. Connect to it with the default password "**r0123456**". For iOS users, you need to grant "local access" to Scout App. Now, you can play with the robot already. If you want to set up the robot as an IoT device, follow the App, select or type in your home Wi-Fi SSID and provide the password. This must be done in the "Wi-Fi Direct" mode when the mobile phone connects to Scout. If successful, the robot can switch to the "Wi-Fi Router" mode automatically and connect to the internet. You can control the robot and view the video worldwide in "Wi-Fi Router" mode.



### 10.1.2 Live video with movement control

The main control panel is shown below. The controller is overlaid with the camera view from Scout.



The following table illustrates the icons in the App.

Icon	Functions or Status
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Status showing Scout is Wi-Fi direct mode, where Scout connects to the mobile phone directly. Green indicates that the mobile phone is connected with Scout. Red indicates unconnected.



Status showing Scout is Wi-Fi router mode, where Scout connects to home Wi-Fi router and goes online. Green indicates that the mobile phone is connected with Scout. Red indicates unconnected.



Indicate that the robot is in the Charging Station. Press to get out of the Charging Station. Only when the robot is outside the Charging Station, it can be controlled to move around.  
**User must press this button to release the robot first.**



Indicate that the robot is outside the Charging Station. Press to return to the Charging Station autonomously.



Patrol paths. Press the “+” to create and name new path. Long press the existing path to delete. To create new patrol path, users control Scout to navigate. A path is drawn. When Scout returns to its Charging Station, it saves the path and follows path for future patrol.



Setup motion detect. Motion detect only works when Scout is in the Charging Station.



Take a photo and store in local memory.



Record video clip and store in local memory.



Enable and Disable speaker.

### 10.1.3 Set up patrol

Multiple patrol paths can be set up with different names. To set up the patrol path, users must tap the

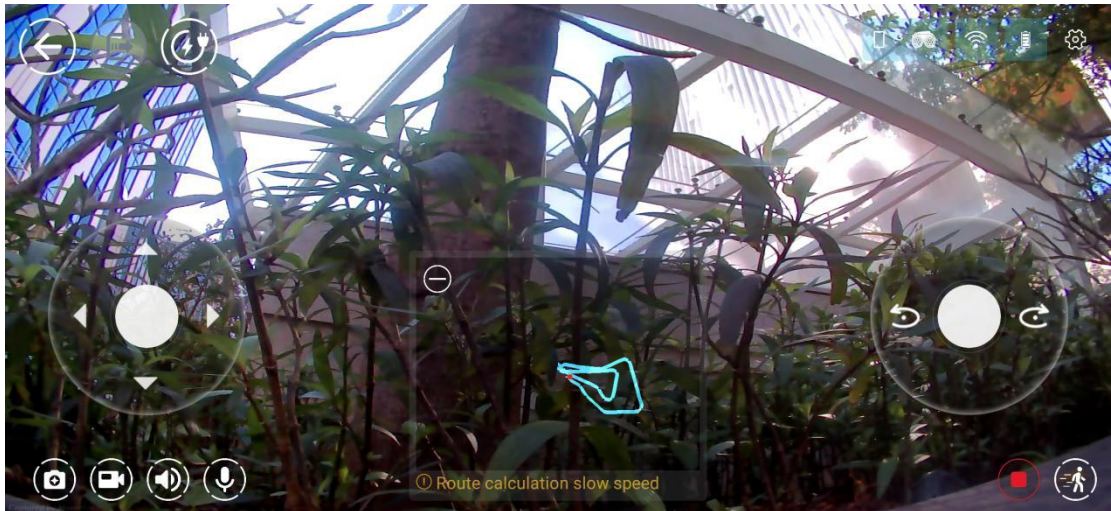
“path” symbol in the App, provide a new pathname and manually control the robot to create the desired path. The patrol path setup must start with Scout in its Charging Station. The Charging Station is the coordinates (0,0). To complete the path set up, users can either drive the robot to the far side and hit the “return home” button, or drive the robot back to the Charger Station, then press the “stop” button to save. Only when the robot can find its Charging Station at the end of the patrol path, the new path can be saved. Scout will remember it, follow the path to patrol whenever needed, and go back to its Charging Station once the job is complete. The video of each patrol can be stored locally onto the flash memory inside Scout. When enabled in the setup and human bodies and/or pets are detected, Scout would upload 13-second video clips to the cloud server.

To delete the paths, long-press the pathname, an “x” sign pops up. Tap the “x”, the path is deleted.

Once the patrol path is set, users can trigger patrol using a timer, triggering events in smart home system (e.g. door sensor), and Alexa/Google Home/Siri voice.

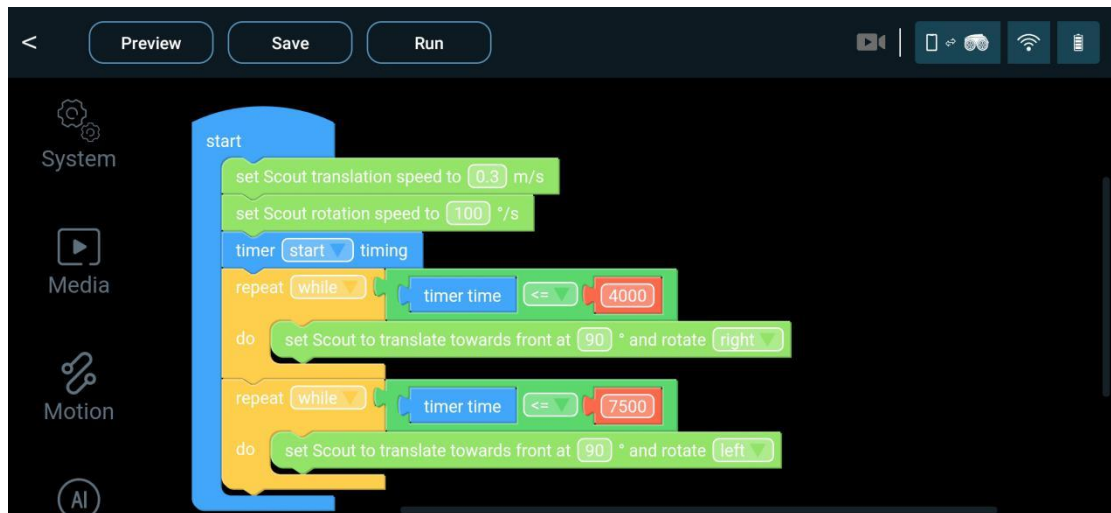


Due to certain limitations, only one path can be triggered by Alexa or Google Home at the moment. If not specified, that is the last executed patrol path.



#### **10.1.4 Scratch Programming**

Scout supports standard Scratch programming. There are a lot of tutorials out there to learn this type of graphic programming. The following is the UI for Scratch Programming. Several samples are provided in the App.



### 10.1.5 Work with Alexa and Google

Scout is a “work with Alexa and Google Home” device. Users can pair the robot with Alexa and/or Google Home account. Video can be streamed to Echo Show or other screen devices. Voice commands can control the movement of the robot.

At the moment, only one patrol path is triggered by Alexa or Google Home.

To pair with an Alexa account, follow Scout App, log in to your Alexa account. Your Scout is paired with your Alexa.

To pair with an Google Home account, use Google Assistant App, type “ask **robot scout** ...”, follow the App to login, and pair Scout with your Google account.



## Alexa Voice Commands

The following table contains the voice commands to control the robot.

	Skills	Launch Phrase	Description
1	Video skill	"Alexa, show my camera."	Stream video to Echo Show and Spot. Camera name can be customized.
2	Start patrol	"Alexa, ask	Voice command to start

		robot Scout to start patrol."	autonomous patrol. Only default patrol path can be activated by voice.
3	Stop patrol	"Alexa, ask robot Scout to stop patrol."	Voice command to stop autonomous patrol. Scout is expected to go back to its Charging Station autonomously.
4	Leave the Charging Station	"Alexa, ask robot Scout to leave the Charging Station."	Scout will come out of its Charging Station.
5	Return to the Charging Station	"Alexa, ask robot Scout to return to the Charging Station."	Scout will go back to its Charging Station, if it can identify a right path.
6	Start recording	"Alexa, ask robot Scout to start	Start video recording and store in local on-board flash.

		recording.”	
7	Stop recording	“Alexa, ask robot Scout to stop recording.”	Stop video recording.
8	Take photo	“Alexa, ask robot Scout to take a photo.”	Take a photo and store in local on-board flash.
9	Turn left	“Alexa, ask robot Scout to turn left.”	Make Scout turn left.
10	Turn right	“Alexa, ask robot Scout to turn right.”	Make Scout turn right.
11	Move to the left	“Alexa, ask robot Scout to move to the left by XYZ inch(es).”	Move to the left. XYZ is a number. The default is 1 inch.

12	Move to the right	"Alexa, ask robot Scout to move to the right by XYZ inch(es)."	Move to the right. XYZ is a number. The default is 1 inch.
13	Move forward	"Alexa, ask robot Scout to move forward by XYZ inch(es)."	Make Scout move forward. XYZ is a number. The default is 1 inch.
14	Move backward	"Alexa, ask robot Scout to move backward by XYZ inch(es)."	Make Scout move backward. XYZ is a number. The default is 1 inch.
15	Clockwise rotate	"Alexa, ask robot Scout to rotate clockwise by	Make Scout rotate clockwise. XYZ is a number. The default is 45 degrees.

		XYZ degree(s)."	
16	Counter-clockwise rotate	"Alexa, ask robot Scout to rotate counter clockwise by XYZ degree(s)."	Make Scout rotate counter clockwise. XYZ is a number. The default is 45 degrees.

## Google Home Voice Commands

Google Home voice commands are the same as above, only with the wake word "Hey Google" or "OK Google". For example, "Hey Google, ask **robot Scout** to start patrol."

## 11. BIST (Built-In-Self-Test)

BIST is a built-in automated diagnosis program to cover hardware testing. To perform BIST, the App must connect to the robot in either Wi-Fi direct mode or in Wi-Fi router mode. Place the robot on its Charging Station, start the BIST program in the App setup section. The robot moves out and produces some high-pitched sound. In the end, a report is generated on the App.

## 12. Add-on tools

Scout is also a robotic development platform. A UART port is available on the top of the robot. Remove the metal panel, the UART port is accessible. One can use 3D printing to design new tools for Scout. From LED torch to toy gun, to a robotic arm. Only imagination is the limit. Complex tools may require C/C++ programming. Scout's robotic control layer is open source. For serious developers, please contact us at [contactus@moorebot.com](mailto:contactus@moorebot.com) for more information.



## 13. Contact us

If you need help, please don't hesitate to contact Moorebot Support [customerservice@moorebot.com](mailto:customerservice@moorebot.com) or call +1 (858) 832-2587.

## 14. Warranty

To review your warranty coverage, please visit [www.Moorebot.com/pages/warranty](http://www.Moorebot.com/pages/warranty).

## 15. Disposal of the Device (Environment)

**At the end of the product life cycle, you should not dispose of this product with normal household waste. Take this product to a collection point for the recycling of electrical and electronic equipment.**

**Please contact your local authorities in case you**

**need more information on the collection points in your area.**

## 16. FCC and IC regulations

### **FCC Part 15**

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the Federal Communication Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful interference in the residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the

interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TA technician for help.

Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Caution:** To maintain compliance with the FCC's RF exposure guideline, place the unit at least 20cm away from nearby persons. To ensure the safety of users, the

FCC has established criteria for the amount of radio frequency energy that can be safely absorbed by a user or bystander according to the intended usage of the product. This product has been tested and found to comply with the FCC criteria.

### **Warning**

Changes or modifications, to this equipment not expressively approved by the party responsible for compliance, could void the user's authority to operate the equipment.

The Socket-outlet shall be installed near the equipment and shall be easily accessible.

### **Industry Canada**

This device complies with Industry Canada license-exempt RSS standard(s); Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The term "IC" before the certification/registration

number only signifies that the Industry Canada technical specifications were met. This product meets the applicable Industry Canada Technical specifications.

## 17. Technical Specifications

### Communication

Dual-band 2.4G/5G Wi-Fi 802.11 a/b/g/n

Bluetooth 4.2 (off by default)

### Power Supply

USB 5V, >2A

### Battery

Battery Type: 18650 Rechargeable Li-ion

### Battery

Battery Capacity: 2000mAh (expected to operate for >2 hours, without Night Vision)

### Camera

Sensor: 2M Pixel CMOS (1080P)

Angle: Wide Angle 120 degree

Night Vision: IR Infrared (mechanical IR cut)

### Audio

1W Speaker

1x Microphone

## CPU

Quad-Core ARM A7 @1.2GHz

512MB LPDDR III

4GB eMMC Storage

## OS

Linux + ROS

## Motors & Wheels

4x high-speed DC motors

4x novel Mecanum wheels

## Sensors

6DoF IMU

Light sensor

ToF (Time to Flight)

## Waterproof

Not waterproof

## Maximum Speed

~2km/h or ~1.2miles/h

## Operating Temperature

-10C to 45C