



Scout

Security Home Robot



Owners Manual

Index



Safety Instructions.....	4
What’s in the box?.....	5
What can Scout do?.....	6
Getting Started.....	7
Place the charging station.....	7
Charge the Battery.....	8
Powering Scout On & Off.....	8
Reset.....	8
Recovery.....	9
Connecting Scout.....	9
Download Scout App.....	9
Connect to Scout.....	10
Scout App Illustrated.....	11
Overview of Scout App.....	11
Sign up your Moorebot Account.....	11
Connecting to Scout via Wi-Fi Direct.....	12
Connecting Scout to your Home Wi-Fi Network.....	14
Over-The-Air (OTA) update.....	14
Controlling Scout with live video.....	15
Set up a Patrol.....	17
Setup Detect for Motion, Human Body, Dogs, and Cats.....	18
Track and Follow a human or a pet.....	18
Scratch Programming.....	19
Work with Alexa and Google.....	20
Alexa Voice Commands.....	21
Google Home Voice Commands.....	23
SiRi Voice Commands.....	25
BIST (Built-In-Self-Test).....	26
Add-on tools.....	27
Contact us.....	27
Warranty.....	27
Disposal of the Device.....	27
FCC and IC regulations.....	28
DISCLAIMER OF WARRANTY.....	29
LIMITATION OF LIABILITY.....	30
Technical Specifications.....	31
Appendix I Custom Scratch API for Scout.....	33
1. System.....	33

2. Media.....	34
3. Motion Control.....	34
4. AI Functions.....	36

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. Age of 12+ is recommended.
- 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.
- The unit's outer surface may become hot during use.
- Scout contains small parts that could become a choking hazard.
- Charge the robot only with the charging station provided with your device. Keep the exposed charging pins on the charging station and the robot away from water and other conductive material. Using an improper charging method or shorting the charging pins may result in fire or explosion.
- Always choose adapters with circuit breaker, fuse, or other short circuit protection.
- Do not disassemble, crush, open, puncture, shred the robot.
- Do not use your robot near heat sources, food, chemicals, or in strong sunlight.

What's in the box?

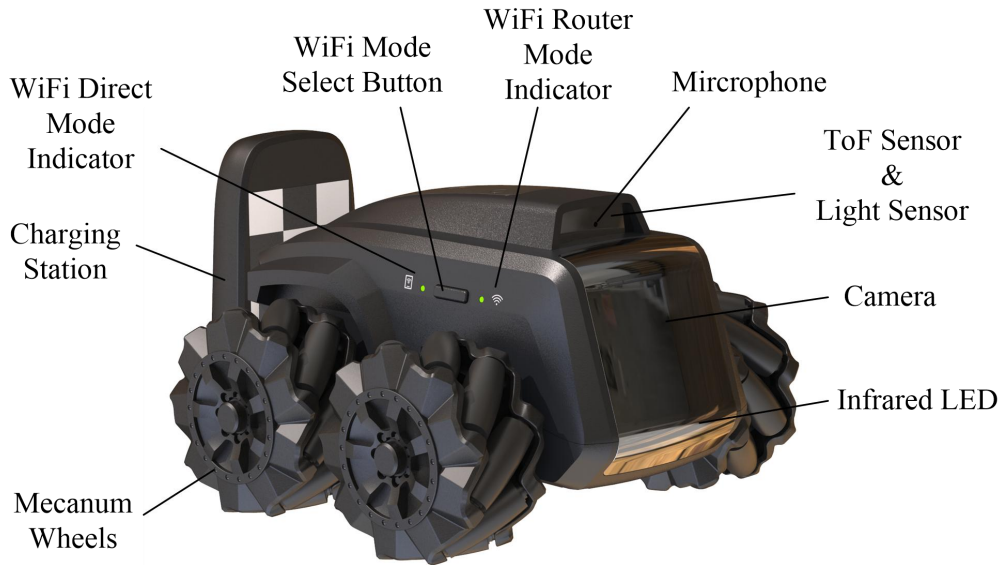
- ✓ Scout Robot
- ✓ Charging Station
- ✓ Adhesive tape (x2)
- ✓ Type-C USB cable
- ✓ Quick Start Guide
- ✓ Lubricant for Mecanum wheels

Important note:

Scout doesn't provide a power adapter. It is recommended to use a USB 2.0 Type A adapter with 5V and >2A output. **Some fast chargers with Type C output are NOT suitable for Scout.**

Place the charging station in an area with good lighting conditions to the floor or wall with the supplied adhesive tape. Not recommended to stick the charging station to painted wood flooring. Scout's Mecanum wheels and docking to the charging station are optimized for hard floor. **Scout will not operate well on Hi-Pile or Shag carpeting.**

Don't remove the sticker underneath the charging station. If the charging station is too low, it may not have good contact to the charging pins on the bot.



What can Scout do?

- **Monitoring.** Scout is a smart robot with an FHD camera on wheels. Once connected, the App can control Scout 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 from the smart home system, etc. During the 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.

Getting Started

Place the charging station

Affix the charging station to the floor or against the wall using the supplied adhesive tape.

To support patrol, it is important to make sure that the charging station does NOT move around. If placing on carpeting it is recommended to affix to the wall or baseboard using the adhesive tape supplied.

It is also recommended to have at least 3 ft open space on each side of the charging station, so that it is easier for the bot to navigate back to its charging station with running into too many obstacles.

Plug the Type C USB cable into the charging station and into a 5V > 2A USB adapter (not supplied).

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.

Charge the Battery

Place the rear of Scout in the Charging Station making sure it's in contact with the charging pins.

You will see 4 blue flashing LEDs on the top of Scout and hear a tone confirming Scout has connected and is charging.

All 4 LED lights will remain lit when Scout is fully charged. This may take up to 3 hours to complete.

Powering Scout On & Off

Press the "On & OFF" button for 2 seconds until the Power LED lights up. The system boots up. The power up process could take up to one minute. There is a sound alert when the system is fully on.

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.

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.

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. (Recommend to press the REST button first.) 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.

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)

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.

Scout can be controlled using the IOS or Android App only not from a PC or MAC.

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 Network**" of the Scout App is granted. Otherwise, the OS doesn't allow Wi-Fi Direct connection. Some iPhones need to disable mobile data, and put the phone in "**Airplane**" mode.

Scout App Illustrated

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 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.

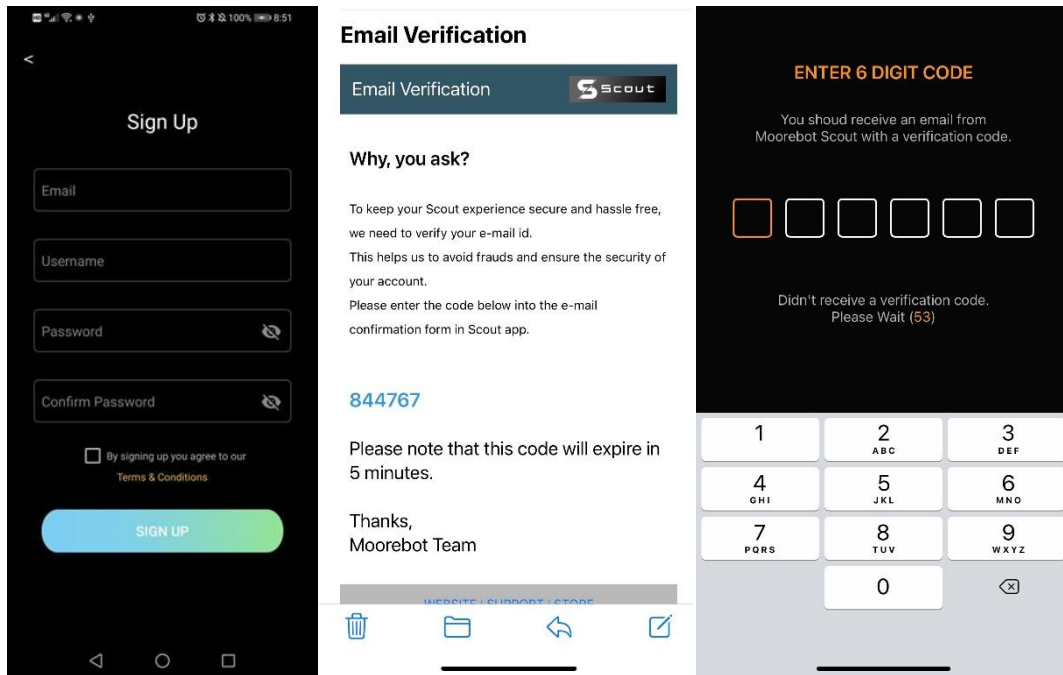
Moorebot Scout App also supports Scratch Programming. Users can program and control the robot with this graphical programming interface.

Sign up your Moorebot Account

Open the Moorebot Scout App and follow the instructions to set up your Moorebot account to register and control your Scout.

You will be receiving a confirmation code to the email address you use so be sure to check your spam folder or whitelist emails from

Moorebot-noreply@mail.moorebot.com



Once sign up, a free trial of the cloud service is granted. Users can enjoy benefits such as notifications to the mobile phone, video storage on the cloud, and more. Monthly or annual payment to extend the cloud service is accepted. The transaction is based on a secure platform by **Stripe**.

Scout's cloud server is Amazon AWS. The root server is based in the east coast of the United States. We keep high standards regarding privacy and data security.

Connecting to Scout via Wi-Fi Direct

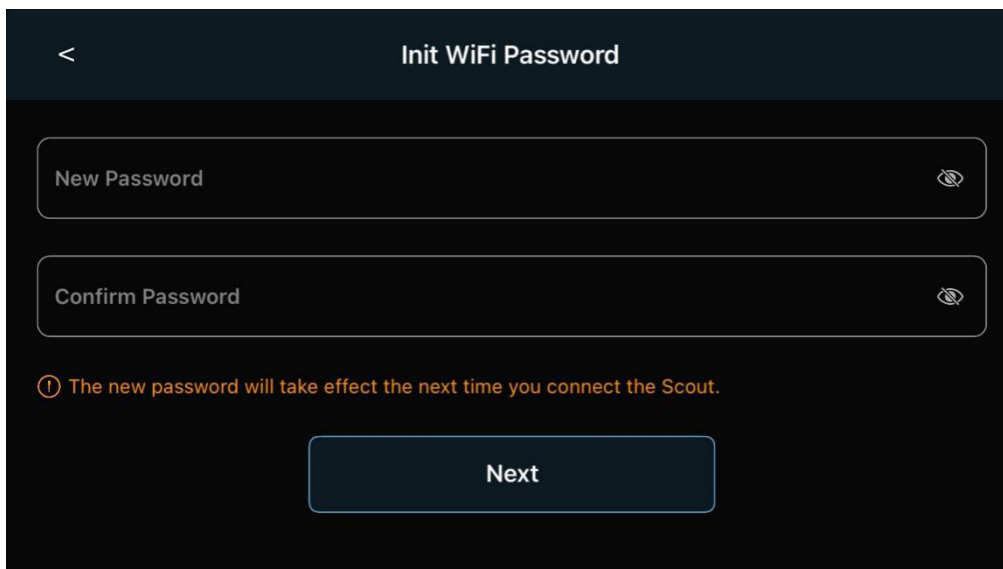
Turn on the robot. Make sure your Scout is in the Charging Station and follow the instruction in the App.



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.

Next, choose a new password for your Scout.

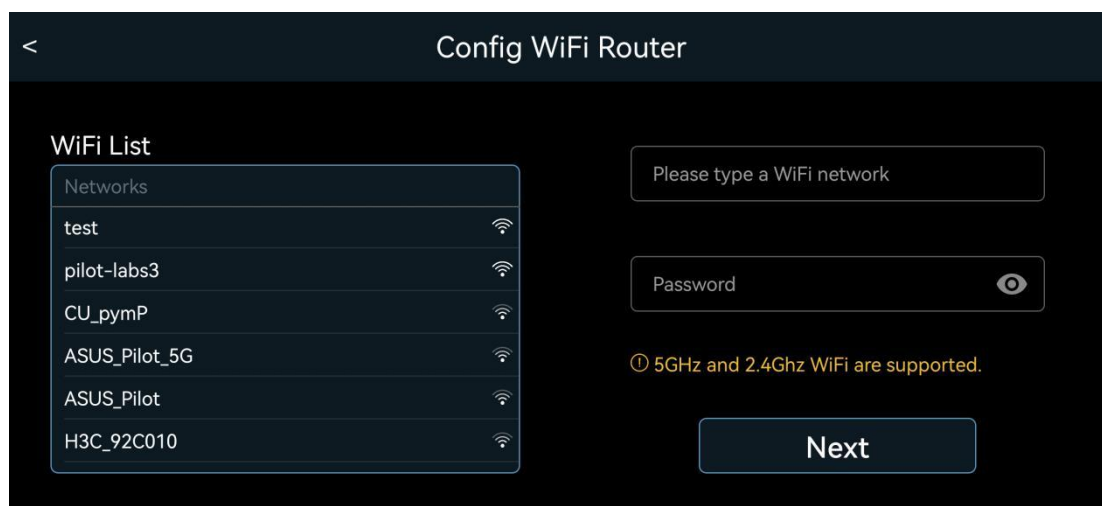


Now, you can play with the robot already. Scout supports WPA2 protocol only.

Connecting Scout to your Home Wi-Fi Network

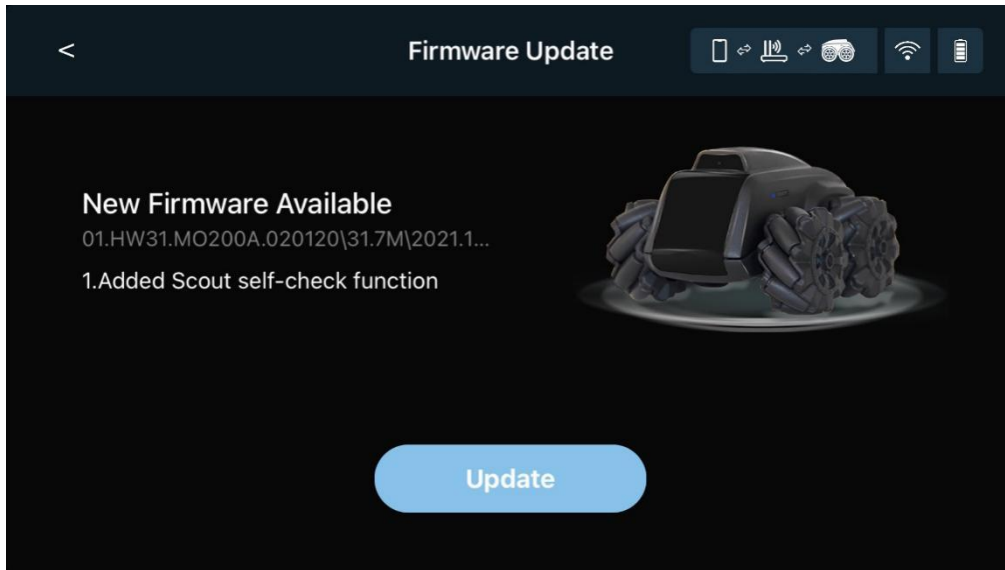
If you want to set up the robot as an IoT device, follow the App, choose or type in your home Wi-Fi SSID and provide the password. This must be done in the “Wi-Fi Direct” mode when the mobile phone connects to Scout.

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.



Over-The-Air (OTA) update

Once Scout connects to the internet, check the setting Tab and see if there is a new Firmware Update available. The Over-The-Air (OTA) update could take several minutes and may require manual reboot.













Controlling Scout with live video

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
------	---------------------

	<p>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.</p>
	<p>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.</p>
	<p>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.</p>
	<p>Indicate that the robot is outside the charging station. Press to return to the charging station.</p>
	<p>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.</p>
	<p>"Track and Follow" a human or a pet. The robot tends to track and follow the subject in the middle of the camera image.</p>
	<p>Setup motion detect. Motion detect only works when Scout is in the charging station.</p>
	<p>Take a photo and store in local memory.</p>
	<p>Record video clip and store in local memory.</p>
	<p>Enable and Disable speaker.</p>

Set up a 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).

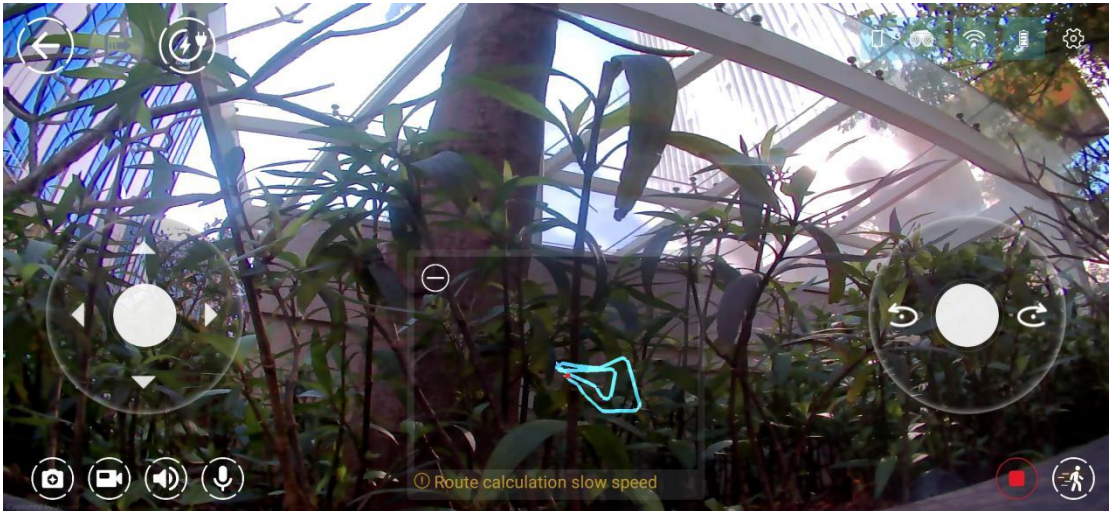
To complete the path set up, users can either drive the robot to the far side and hit the "return home" button, or drive the robot back to the Charger Station, then press the "stop" button to save. Only when the robot can find its charging station at the end of the patrol path, the new path can be saved. 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.



Setup Detect for Motion, Human Body, Dogs, and Cats

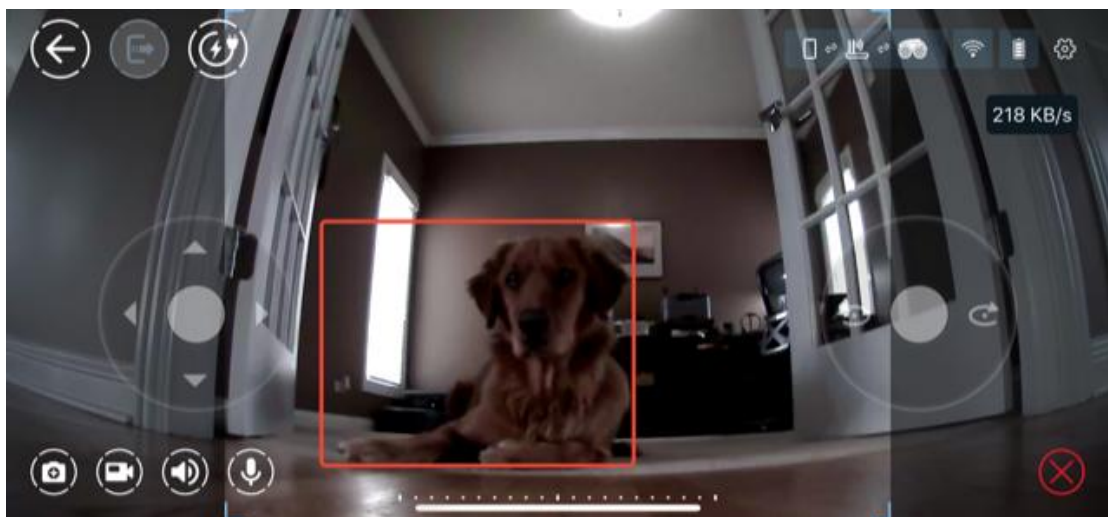
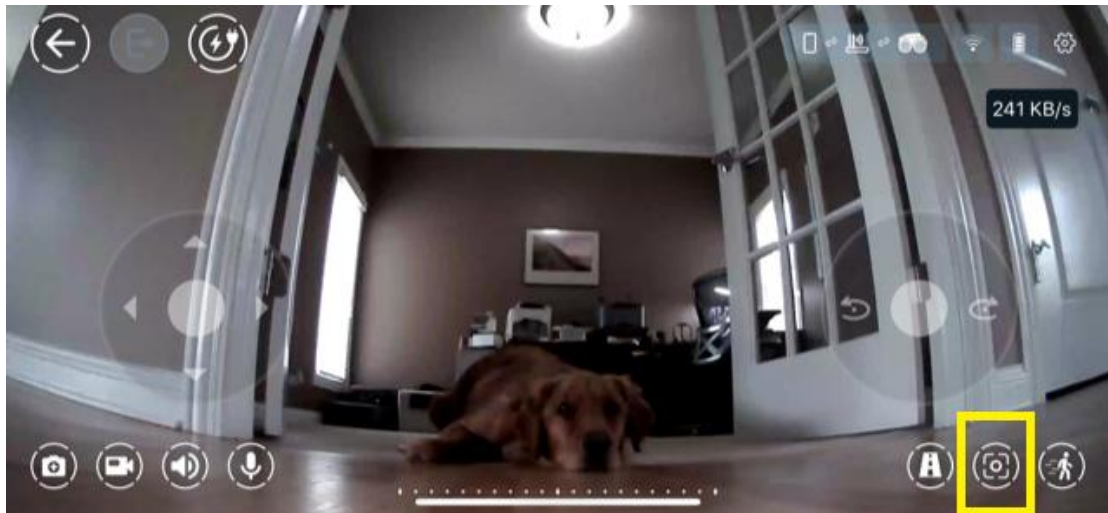
Automatic detect of motion, human body, dogs and cats can be enabled in the App set up section. Motion detect in the entire camera view or selected zone works only when Scout is in the charging station as stationary camera.

Scout also supports recognition of human body, dogs and cats. These detect features work when the bot is in the charging station or during patrol. They are not available when users drive the bot manually.

When users enable the cloud service, push messages can be sent to user's mobile phone with a 13-second video after the detects are triggered.

Track and Follow a human or a pet

The robot is capable of identifying a human body or a pet and following the subject. This is a fun feature. The launch button is at the lower-right corner of the main video and control page, with square in the icon. When a subject is identified, the red box appears and the robot follows the subject around. If there are multiple subjects in the camera, the robot tends to track the one in the middle. That may change in the future software release. The scanning and the tracking App screen shots are in below:

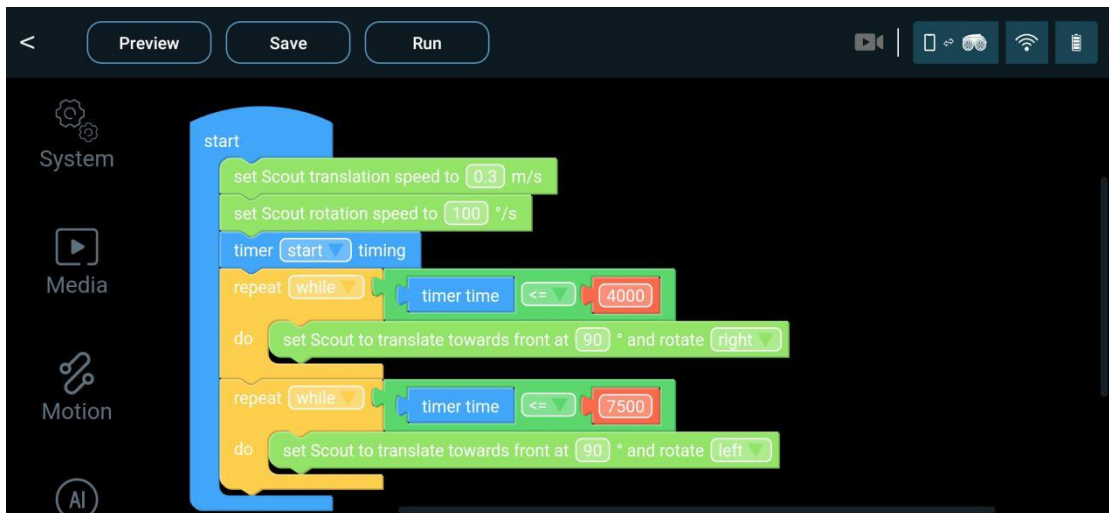


Scratch Programming

Scout supports standard Scratch programming. There are a lot of tutorials out there to learn this type of graphic programming. The site by MIT is a good reference.

<https://scratch.mit.edu/>

The following is the UI for Scratch Programming. Several samples are provided in the App.



This graphical program generates Python codes and runs on Scout's ROS system. The Scout Scratch modules are divided into several categories, System, Media, Motion Control, Ai functions, Logic, Math, Loops, Lists, and Variables. Among them, Logic, Math, Loops, Lists, and Variables are standard modules by Blockly.

The APIs for System, Media, Motion Control and Ai functions are listed in the Appendix I of this user manual. Please refer to the latest App as more functions are constantly added to this program.

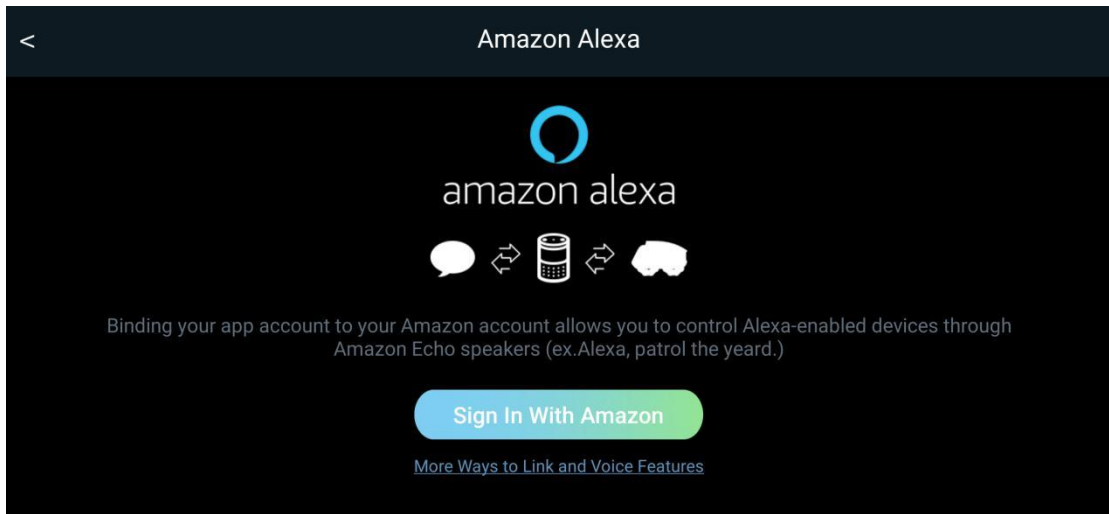
Work with Alexa and Google

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 robot Scout to start patrol."	Voice command to start patrol. Only default patrol path can be activated by voice.
3	Stop patrol	"Alexa, ask robot Scout to stop patrol."	Voice command to stop patrol. Scout is expected to go back to its charging station.
4	Leave the charging station	"Alexa, ask robot Scout to leave the charging"	Scout will come out of its charging station.

		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 recording."	Start video recording and store in local on-board flash.
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 XYZ degree(s)."	Make Scout rotate clockwise. XYZ is a number. The default is 45 degrees.
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."

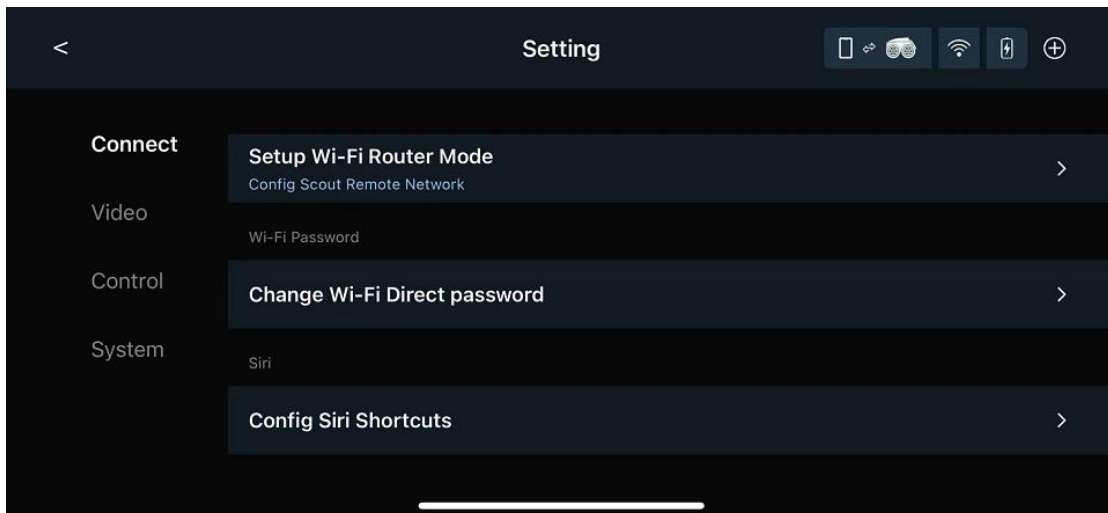
	Skills	Launch Phrase	Description
1	Video skill	"Hey Google, show my camera."	Stream video to Echo Show and Spot. Camera name can be customized.
2	Start patrol	"Hey Google, ask robot Scout to start patrol."	Voice command to start patrol. Only default patrol path can be activated by voice.
3	Stop patrol	"Hey Google, ask robot Scout to stop patrol."	Voice command to stop patrol. Scout is expected to go back to its charging

			station.
4	Leave the charging station	"Hey Google, ask robot Scout to leave the charging station."	Scout will come out of its charging station.
5	Return to the charging station	"Hey Google, 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	"Hey Google, ask robot Scout to start recording."	Start video recording and store in local on-board flash.
7	Stop recording	"Hey Google, ask robot Scout to stop recording."	Stop video recording.
8	Take photo	"Hey Google, ask robot Scout to take a photo."	Take a photo and store in local on-board flash.
9	Turn left	"Hey Google, ask robot Scout to turn left."	Make Scout turn left.
10	Turn right	"Hey Google, ask robot Scout to turn right."	Make Scout turn right.
11	Move to the left	"Hey Google, 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	"Hey Google, ask robot Scout to move to the	Move to the right. XYZ is a number. The default is 1 inch.

		right by XYZ inch(es)."	
13	Move forward	"Hey Google, 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	"Hey Google, 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	"Hey Google, ask robot Scout to rotate clockwise by XYZ degree(s)."	Make Scout rotate clockwise. XYZ is a number. The default is 45 degrees.
16	Counter-clockwise rotate	"Hey Google, 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.

SiRi Voice Commands

To use SiRi voice control, go to the setup section of Scout iOS App. Tap "Config Siri Shortcuts".



Users can pair any SiRi phases to the following robot control comments. More controls will be available in the future through software update.



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.

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 for more information.

Contact us

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

Warranty

To review your warranty coverage, please visit www.Moorebot.com/pages/warranty.

Disposal of the Device

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.

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.

DISCLAIMER OF WARRANTY

DUE TO THE NATURE OF THE SOFTWARE AS FREWARE, THERE IS NO WARRANTY FOR THE SOFTWARE, TO THE EXTENT PERMITTED BY APPLICABLE LAW. THE SOFTWARE IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE SOFTWARE IS WITH THE LICENSEE. COMPANY AND ITS AFFILIATES, PARTNERS, SUPPLIERS AND LICENSORS HEREBY DISCLAIM ANY AND ALL REPRESENTATIONS, WARRANTIES AND GUARANTIES REGARDING THE APPLICATION AND THIRD PARTY CONTENT AND SERVICES. FURTHERMORE, COMPANY AND ITS AFFILIATES, PARTNERS, SUPPLIERS AND LICENSORS MAKE NO WARRANTY THAT (I) THE APPLICATION OR THIRD PARTY CONTENT AND SERVICES WILL MEET YOUR REQUIREMENTS; (II) THE APPLICATION OR THIRD PARTY CONTENT AND SERVICES WILL BE UNINTERRUPTED, ACCURATE, RELIABLE, TIMELY, SECURE OR ERROR-FREE; (III) THE QUALITY OF ANY PRODUCTS, SERVICES, INFORMATION OR OTHER MATERIAL ACCESSED OR OBTAINED BY YOU THROUGH THE APPLICATION WILL BE AS REPRESENTED OR MEET YOUR EXPECTATIONS; OR (IV) ANY ERRORS IN THE APPLICATION OR THIRD PARTY CONTENT AND SERVICES WILL BE CORRECTED. SHOULD THE SOFTWARE PROVE TO BE DEFECTIVE, THE LICENSEE HAS TO ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

LIMITATION OF LIABILITY

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THE CUMULATIVE LIABILITY OF PILOT LABS, AND PILOT LABS AFFILIATES, LICENSORS, AND SUPPLIERS FOR ALL MATTERS ARISING FROM OR RELATING TO THIS AGREEMENT SHALL BE LIMITED TO THE AMOUNT PAID BY CUSTOMER OR END USER FOR THE SOFTWARE, PRODUCT OR SERVICES, AS APPLICABLE, IN THE SIX (6) MONTHS PRIOR TO THE DATE THE LIABILITY AROSE. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW WILL PILOT LABS BE LIABLE TO THE LICENSEE FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES ARISING OUT OF THE USE OR INABILITY TO USE THE SOFTWARE (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY THE LICENSEE OR THIRD PARTIES OR A FAILURE OF THE SOFTWARE TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

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

0C to 40C

Appendix I Custom Scratch API for Scout

1. System

Module Name	start
Blckly Function	System_start
Python code	rollereye.start()
Function info	Start program

Module Name	timer (start / stop / pause) timing
Blckly Function	Timer_control
Python code	rollereye.timerStart() / rollereye.timerPause() / rollereye.timerStop()
Function info	Start / Stop / Pause the timer

Module Name	timer time
Blckly Function	Timer_time
Python code	rollereye.getTimerTime()
Function info	Get the total time elapsed from when the timer was started in milliseconds

Module Name	program runtime
Blckly Function	runtime
Python code	rollereye.getRunTime()
Function info	Get the total time elapsed from when the robot began running up to the current time in milliseconds

Module Name	current timestamp
Blckly Function	System_ctime
Python code	rollereye.getCurrentTime()
Function info	Get the system timestamp from 01/01/1970 00:00:00 in milliseconds

Module Name	program stop
Blckly Function	System_stop

Python code	rollereye.stop()
Function info	Stop the program

2. Media

Module Name	set media value (0:100)
Blckly Function	Media_soundvolume
Python code	rollereye.set_soundVolume(int value)
Function info	set media volume

Module Name	play sound effect
Blckly Function	Media_soundeffect
Python code	rollereye.play_sound(int effectID, boolean isFinished)
Function info	The robot emits a sound and executes the next command

Module Name	play sound effect until finished
Blckly Function	Media_soundeffect_1
Python code	rollereye.play_sound(int effectID, boolean isFinished)
Function info	The next command is not executed until a specific sound is emitted

Module Name	take photo
Blckly Function	Media_takephoto
Python code	rollereye.capture()
Function info	take photo

Module Name	start / stop video recording
Blckly Function	Media_soundeffect_1
Python code	rollereye.reocrd_start() / rollereye.record_stop()
Function info	start / stop recording

3. Motion Control

Module Name	set Scout translation speed to (0:1) m/s
Blckly Function	Motion_set_translation_speed
Python code	rollereye.set_translationSpeed(float speed)
Function info	set translation speed

Module Name	set Scout rotation speed to (0:1) m/s
Bckly Function	Motion_set_rotation_speed
Python code	rollereye.set_rotationSpeed(float speed)
Function info	set translation speed

Module Name	set wheel rotation speed(rpm) to front-left/front-right/rear-left/rear-right(-1000:1000)
Bckly Function	Motion_set_Mecanum_wheel(TBD)
Python code	rollereye.set_wheel(int front-left, int front-right,int rear-left,int rear-right)
Function info	The rotation speed of each wheel can be set independently

Module Name	set Scout to translate at (0:360) °
Bckly Function	Motion_set_translate
Python code	rollereye.set_translate(int degree)
Function info	set the Scout to translate in a specified direction

Module Name	set Scout to translate at (0:360) °for (0:20) s
Bckly Function	Motion_set_translate_2
Python code	rollereye.set_translate_2(int degree,int seconds)
Function info	set the duration the Scout to translate in a specified direction

Module Name	set Scout to translate at (0:360) °for (0:5) m
Bckly Function	Motion_set_translate_3
Python code	rollereye.set_translate_3(int degree,int meters)
Function info	set the distance the Scout to translate in a specified direction

Module Name	set Scout to translate at (0:360) °for (0:1) m/s
Bckly Function	Motion_set_translate_4
Python code	rollereye.set_translate_4(int degree,float speed)
Function info	set the Scout to translate in a specified direction and speed

Module Name	set Scout to rotate(left/right)
Bckly Function	Motion_set_rotate
Python code	rollereye.set_rotate(int direction)
Function info	set the Scout to rotate in a specified direction

Module Name	set Scout to rotate(left/right) for (0:20)s
-------------	---------------------------------------------

Bkly Function	Motion_set_rotate_2
Python code	rollereye.set_rotate_2(int direction,int seconds)
Function info	set the duration the Scout to rotate in a specified direction

Module Name	set Scout to rotate(left/right) for (0:360)°
Bkly Function	Motion_set_rotate_3
Python code	rollereye.set_rotate_3(int direction,int degree)
Function info	set the angle and direction of the Scout rotation

Module Name	set Scout to translate towards front at (0:360)° and rotate (left/right)
Bkly Function	Motion_set_translate_rotate
Python code	rollereye.set_translate_rotate(int degree, int direction)
Function info	set the Scout to move in a specific direction while rotating simultaneously

Module Name	stop motion
Bkly Function	Motion_stop
Python code	rollereye.stop_move()
Function info	stop move

4. AI Functions

Module Name	enable/disable person/cat/dog/... Identification
Bkly Function	Smart_sw_reg
Python code	rollereye.enble_reg(reg.person/reg.cat/reg.dog)
Function info	enable or disable the Scout visual identification function for vision person, cat ,dog

Module Name	when person/cat/dog/... identified
Bkly Function	Smart_when_reg
Python code	when (rollereye.recogResult() ==reg.person/reg.dog/reg.cat) pass
Function info	when specific information is identified , the corresponding block runs its internal program

Module Name	when person/cat/dog/... identified
Bkly Function	Smart_when_reg
Python code	when (rollereye.recogResult())

	<code>==reg.person/reg.dog/reg.cat)</code> <code>pass</code>
Function info	when specific information is identified , the corresponding block runs its internal program

Module Name	person/cat/dog/... identified
Blckly Function	Smart_if_reg
Python code	<code>rollereye.recResult(reg.person/reg.cat/reg.dog/...)</code>
Function info	when the specific information(person/cat/dog,etc.)is identified, the condition is return True. Otherwise, it is returned False.

Module Name	wait until person/cat/dog/... identified
Blckly Function	Smart_wait_reg
Python code	<code>rollereye.recWait(reg.person/reg.cat/reg.dog/...)</code>
Function info	when specific information is identified, the Scout continues executing commands. Otherwise, it continues waiting

Module Name	enable/disable motion detect
Blckly Function	Smart_sw_detect
Python code	<code>rollereye.enable_detection()</code> / <code>rollereye.disable_detection()</code>
Function info	enable / disable motion detect

Module Name	when motion detected
Blckly Function	Smart_when_detect
Python code	<code>when (rollereye.motionDetected())</code> <code>pass</code>
Function info	when detected motion,the corresponding block runs its internal program

Module Name	enable / disable motion follow
Blckly Function	Smart_sw_follow
Python code	<code>rollereye.enable_follow()</code> / <code>rollereye.disable_follow()</code>
Function info	enable / disable the Scout follow something moved