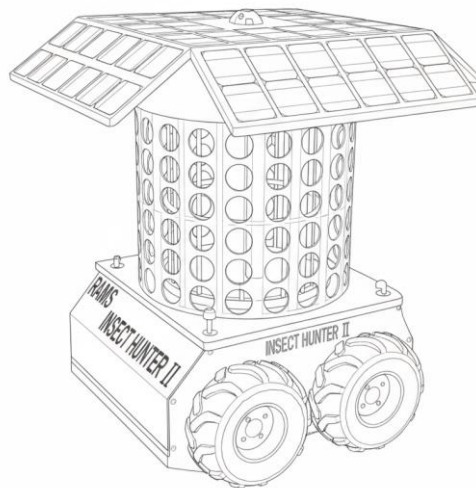# Ramis Insect Hunter User Manual

Nature Protected by Innovation

RAMISTECH

Introduction

The **RamisTech Insect Hunter** is an autonomous, solar-powered agricultural robot designed to provide *chemical-free pest control* for farms of all sizes. Using **UV-based phototaxis**, dual high-velocity suction fans, and an **internal zapper**, the robot attracts, captures, and eliminates harmful insect pests throughout the night, without pesticides, fuel, or manual labor.

Powered by a **solar system**, equipped with **LIDAR + SLAM navigation**, and supported by a robust mobile app, the Insect Hunter protects crops sustainably while reducing operational costs and environmental impact.

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1. Intended Use of the Insect Hunter Robot

The RamisTech Insect Hunter is an autonomous, chemical-free pest control robot designed for outdoor agricultural environments. Its primary function is to reduce insect populations in crop fields through targeted, non-chemical extermination using UV attraction, suction airflow, and a high-voltage internal grid. It is engineered to operate in farms of various sizes, including row crops, open fields, orchards, and mixed-vegetation agricultural areas, provided that navigation conditions are suitable.

The robot is intended to perform the following functions:

1. Autonomous Field Navigation

The Insect Hunter navigates farmland independently using LIDAR, SLAM algorithms, and GPS systems. Once deployed, it maps and follows predefined routes or zones uploaded through the RamisTech mobile application.

2. Chemical-Free Pest Reduction

Using UV-based phototaxis attraction, dual fans, and an internal high-voltage grid, the robot continuously captures and neutralizes harmful flying insects. This process reduces reliance on pesticides, supports organic production, and minimizes environmental impact.

3. Night-Time Pest Control Operations

The system is optimized for dusk-to-dawn operation, when pest activity is highest and UV attraction is most effective. Users can schedule daily operation cycles through the mobile app.

4. Remote Monitoring and Reporting

The robot connects to the RamisTech mobile application, allowing users to track real-time location, coverage area, battery status, pest-chamber capacity, and alerts (including animal-intrusion notifications).

5. Safe, Hands-Free Operation

Once deployed, the robot functions without requiring manual intervention. Integrated safety sensors, including motion detectors, LIDAR, and a protective shut-off switch, ensure that the device disables high-voltage components when humans or large animals are detected nearby.

Important Usage Limitations

To ensure proper and responsible use:

- The robot **must not be operated in fields containing active beehives**, pollinator zones, or areas where beneficial insects are intentionally maintained.
- The device is **designed exclusively for outdoor agricultural fields** and should not be used indoors, in greenhouses, or in confined environments.
- Operation in heavy rain, flooding, or extreme mud is not recommended.

2. <u>Safety Instructions</u>

Before operating the RamisTech Insect Hunter, carefully read and understand all safety instructions in this manual. The Insect Hunter is a fully autonomous robotic unit that integrates navigation, sensing, power, and control systems within a single device. It does not require external controllers, teach pendants, or additional cabling. Each unit includes a secondary rechargeable battery to support extended field operation.

To ensure safe and reliable use, operators must follow all instructions related to handling, charging, storage, maintenance, transportation, and field deployment. Failure to comply may result in reduced performance, equipment damage, safety hazards, or loss of warranty.

RamisTech Co., Ltd. is not liable for damages resulting from misuse, improper handling, unauthorized repairs or modifications, or operation under unsuitable environmental conditions. Misuse includes, but is not limited to, tampering with safety systems, exposing the device to hazardous environments, ignoring maintenance guidance, or using unapproved accessories.

Before activating the Insect Hunter, evaluate field conditions such as weather, terrain, soil moisture, crop height, and any previous pesticide applications.

General Safety

- Operate **outdoors only**; keep the robot away from children and pets.
- Ensure power is disconnected before cleaning, servicing, or storage.
- Do not disassemble, alter, or modify the robot without written authorization from RamisTech.
- Only trained and authorized personnel should perform operation or maintenance.
- Verify that all panels, covers, and protective components are securely installed before use.
- Remove any debris from wheels or vents before starting operation.

Electrical Safety

The Insect Hunter contains high-voltage components. Handle with extreme care.

- Never open or touch internal electrical components while the robot is powered or charging.
- Do not bypass, disable, or alter built-in safety switches, sensors, or protective circuits.
- A safety shut-off system automatically disables the electric grid when a large object (human or animal) is detected. Never attempt to circumvent this system.
- Ensure the fiberglass/plexiglass chamber is intact at all times to prevent accidental contact with internal electrified components.
- Use only **RamisTech-approved** chargers, adapters, and power cables. Third-party equipment may cause malfunction or fire.

Failure to observe electrical safety precautions may result in electric shock, fire, or device failure.

Battery Safety

- Fully charge the backup battery before deployment to avoid interruptions.
- Do not expose batteries to direct sunlight, excessive heat, water, or open flame.
- Never puncture, crush, disassemble, or incinerate the battery.
- If a battery swells, leaks, or emits an unusual odor, discontinue use immediately and contact RamisTech Support.
- Charge and store the battery in a cool, dry, well-ventilated area away from flammable materials.
- Do not short-circuit terminals or allow metal objects to contact them.
- Charge batteries only on stable, non-flammable surfaces using approved chargers.
- In case of smoke or fire, use a **Class D** or **lithium-ion-rated** fire extinguisher. Never use water.
- Dispose of used batteries at certified electronic recycling centers.

UV Light Safety

The device uses ultraviolet light to attract insects.

- Avoid direct eye or skin exposure to the active UV bulbs.
- Never operate the robot with the protective fiberglass cover removed.
- If a UV bulb breaks, disconnect power immediately. Use gloves when handling glass fragments.
- Replace damaged or expired bulbs only with **RamisTech-certified** components.
- Do not look directly at UV light within close range during operation or maintenance.

Operational Safety

- Inspect the robot thoroughly before each use. Do not operate if any component appears damaged, loose, or malfunctioning.
- Keep hands, clothing, tools, and other objects away from moving parts.

- Avoid operation in extreme weather conditions such as heavy rain, strong winds, flooding, or storms.
- Do not operate the robot in deep mud, standing water, or unstable terrain.
- Turn off the robot completely before transporting, lifting, or storing it.
- When transporting, secure the robot to prevent movement or impact.
- Do not attempt to manually intervene while the robot is running; always power down first.

Warnings

Failure to follow safety instructions may result in electric shock, fire, injury, or equipment damage. Operate the RamisTech Insect Hunter only as directed. If uncertain about any aspect of operation or safety, contact RamisTech Technical Support before proceeding.

3. Product Overview

Component Descriptions

1. Base Frame

A strong, lightweight structural platform that supports the entire robot. Designed to withstand vibration, uneven terrain, and exposure to outdoor farm conditions.

2. Wheel Assembly

A four-wheel all-terrain system that provides stability and mobility across soil, fields, and uneven farming surfaces. Includes the axle mounts and suspension rods.

3. Power & Control Housing Tray (Electronics Compartment)

This flat mounting tray provides a secure base for the robot's electronic control boards, connectors, and wiring harnesses. It protects sensitive electronics from vibration, dust, and moisture, while ensuring safe and organized cable routing inside the robot.

4. Motor Mounting Bracket / Internal Drive Frame

This structural frame supports the motors, drive shafts, and mechanical linkages. It ensures proper alignment and stability of the drivetrain, allowing the robot to move smoothly across farm terrain. It also provides mounting points for torque support and internal mechanical integration.

5. Battery Pack

A rechargeable high-capacity battery that powers the robot. It works alongside the solar panel system to extend daily runtime and reduce charging frequency.

6. Sensor & Control Module

The circuit board that controls the robot's navigation, pest-detection functions, and automation features. Includes LIDAR inputs, GPS module connection, motor control, and safety systems.

7. Cooling Fans

Dual cooling fans that regulate airflow inside the electronic housing. They prevent overheating and ensure the robot operates safely in hot outdoor environments.

8. Main Encasement (Upper Body Housing)

A durable shell that protects internal components from dust, water, and impacts. Features ventilation perforations for airflow and displays the **RAMIS** branding.

9. UV Light Tube

A high-efficiency UV lamp that attracts insects using phototaxis. It is positioned centrally to maximize attraction radius and guide pests into the trapping chamber.

10. Zapper Chamber (High-Voltage Extermination Grid)

An electrically charged cylindrical zapper that instantly kills insects attracted by the UV light. Designed for chemical-free, eco-friendly pest control, powered by the robot's solar-battery hybrid system.

11. Cylindrical Fiberglass Cover

A strong and lightweight fiberglass enclosure that surrounds the zapper and UV assembly. It protects internal parts from dust, water, and impact.

12. GPS Antenna Plate

A mounting plate that holds the GPS antenna, ensuring clear satellite visibility for accurate navigation and path planning.

13. Solar Panel Assembly

A fold-roof-shaped solar panel system that provides renewable power to recharge the battery, extend runtime, and reduce dependency on external charging.

14. LIDAR Sensor Dome

A protective dome that houses the LIDAR sensor unit. This sensor maps the environment, detects obstacles, and guides autonomous navigation across farmland.
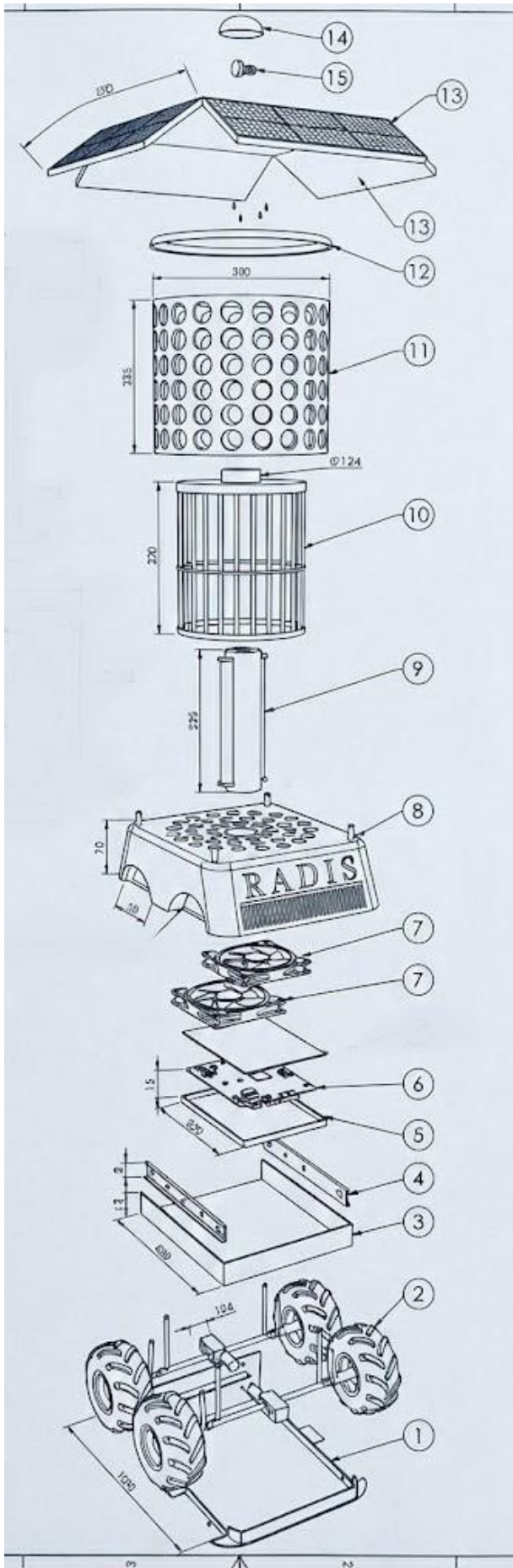
15. Fastening Bolt / Sensor Mount Connector

Used to secure the LIDAR dome or GPS module to the solar housing, ensuring stability during robot movement.

1. Base Frame

2. Wheel Assembly

3. Power & Control Housing Tray

Electronics Housing Tray

4. Motor Mounting Bracket / Internal Drive

Frame

5. Battery Pack

6. Sensor & Control Module

7. Cooling Fans

8. Main Encasement (Upper Body)

9. UV Light Tube

10. Zapper

11. Outer Fiberglass Capture Chamber

12. GPS Antenna Plate

13. Solar Panel Assembly

14. LIDAR Sensor Dome
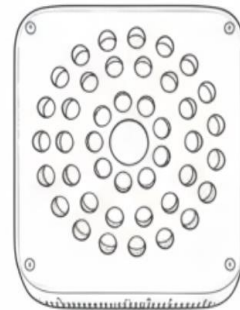
15. LIDAR / Sensor Mount Connector
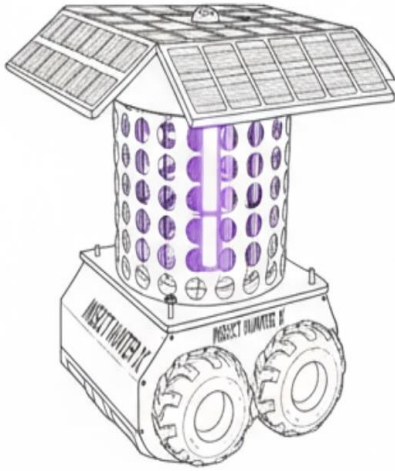
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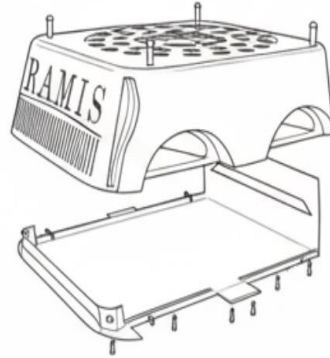
Base Frame
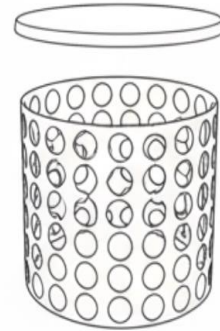
cylindrical fiber glass cover
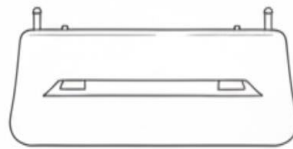
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4. <u>Product Specification</u>

Product Specifications	
Speed	50 rpm
Torque	140 kg.cm
Motor type	Gear motor
Navigation System	Lidar and SLAM system
Field of View (horizontal)	360 degree
Lidar Distance Range	25 Meters
Lidar Sample Rate	16000 times/ second
Alerting System Protocol	GSM/GPRS
Motion Detection Range	7 meters
Motion Detection Field of View	360 degree
Power Supply	Solar System
Power Generation Capacity	480 w
Encloser Cleaning System	Manual and automatic
Wheels type	Special designed agriculture wheels
Wheels diameter	40 cm
Total weight	40 kg
Robot Dimensions	140cm height*60 weight*100 length

5. How to Use the Insect Hunter (Step-by-Step Guide)

Step 1: Initial Setup

1. Unbox the robot carefully and verify that all components are included (wheels, UV light module, zapper assembly, cylindrical chamber, solar roof, battery, sensor module, and accessories).
2. If your unit was shipped partially assembled, follow the included Assembly Guide to attach the upper structure, chamber, and solar roof.
3. Ensure all connectors are firmly seated, including the UV bulb connection, zapper terminals, and fan wiring.
4. Fully charge the battery before first use. This can be done via:
   - The solar panel (place under direct sunlight), or
   - An approved RamisTech external charger.
     Note: Do not operate the robot until the initial charge is complete.

Step 2: Connect to the Mobile App

1. Download the official **RamisTech App** from www.ramistech.com or your device's app store or Google Play.
2. Create a farm profile, entering details such as farm size, crop type, and location.
3. Turn on the robot and enable Bluetooth/Wi-Fi from the control menu.
4. In the app, select "Add New Device" to pair with your robot.
   - Follow the on-screen instructions for wireless connection.
   - Once paired, the robot's live status and settings will become visible on the dashboard.

Step 3: Configure Robot Settings

Using the app, configure the operational parameters:

- Name your robot and assign its designated working areas (zones).
- Set operation schedules, choosing the preferred days and nighttime hours (recommended for maximum UV attraction efficiency).
- Select Emptying Mode:
  - *Automatic*: The robot empties the chamber when full or after each work cycle.
  - *Manual*: You choose when to empty the chamber.
- If using multiple units, enable Auto-Sync Mode for optimized collective coverage and collision avoidance.

Step 4: Deploy in the Field

1. Inspect the field for major obstacles, deep water, or highly uneven terrain.
2. Position the robot at the starting point of the designated zone.
3. Activate the robot from the app or by using the onboard power switch.
4. The robot will automatically begin operation, using:
   - Navigation sensors for route guidance

- o UV attractant light to draw insects
- o Suction and high-voltage grid to collect and exterminate insects
5. Allow the robot to complete its cycle undisturbed for optimal performance.

Step 5: Monitor and Control
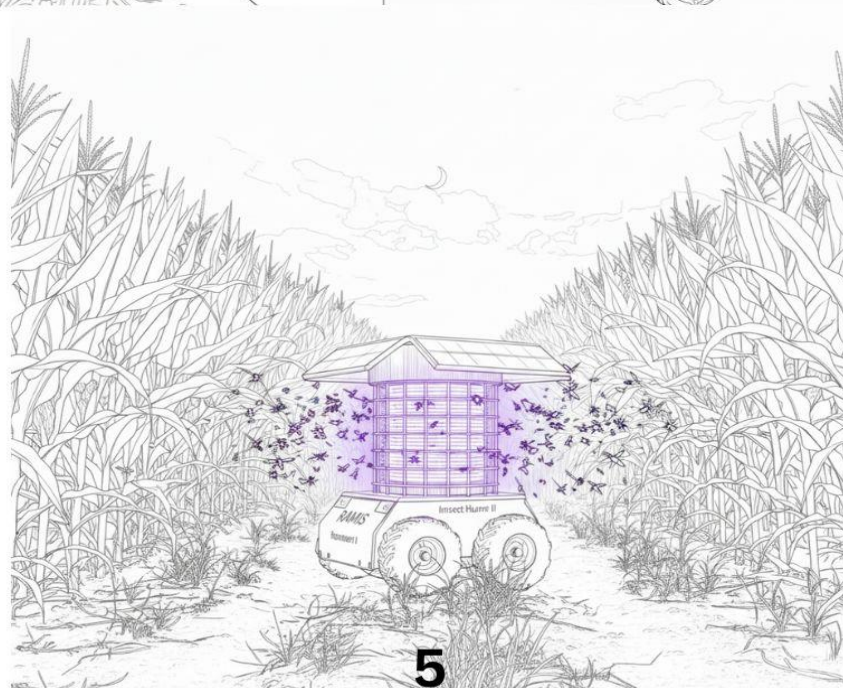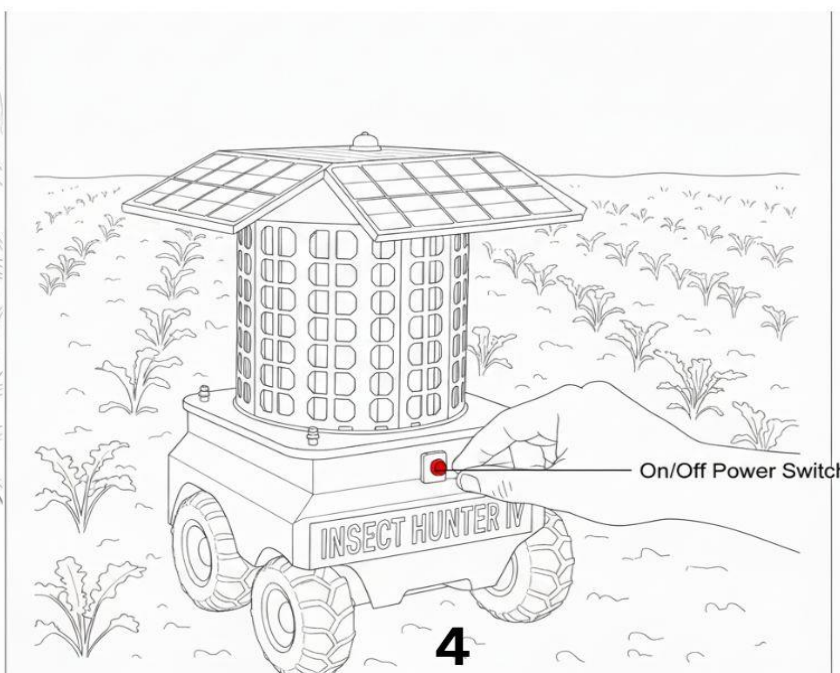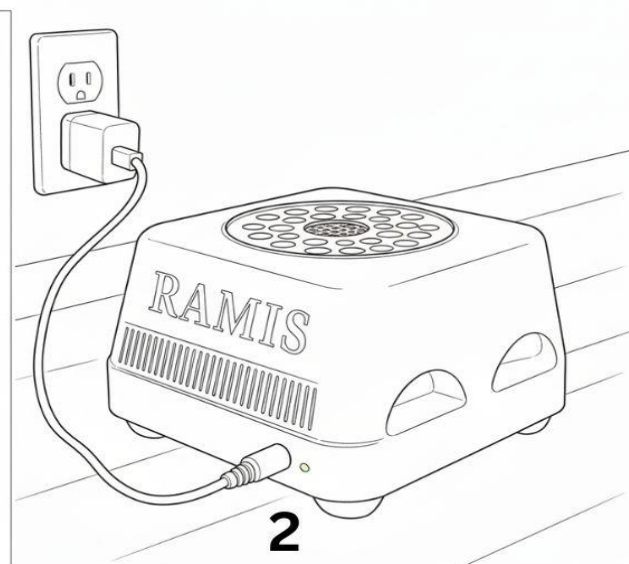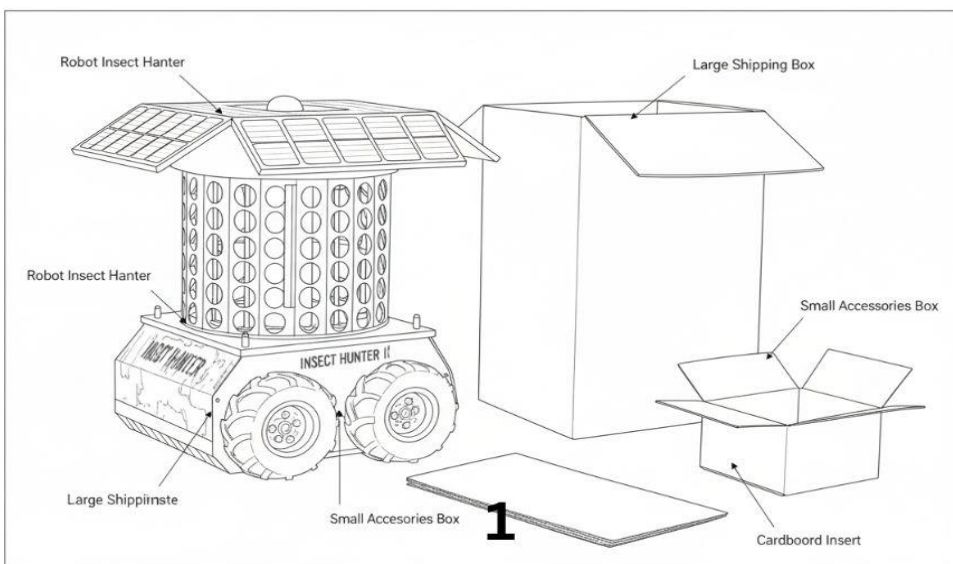
Using the app, you can monitor real-time performance:

- Track robot location and movement path on the farm map.
- View battery status, charger health, and solar-charging activity.
- Check insect chamber fill level and receive alerts when emptying is required.
- Review coverage reports, including completed and pending zones.
- Receive safety alerts, including large-animal detection or system warnings.
- Pause, resume, or stop the robot at any time through the app.

Step 6: Unpack and Inspect

Carefully remove the Insect Hunter robot from its packaging. The total weight is approximately **40 kg**, so use proper lifting techniques or assistance to avoid injury. Once unboxed, inspect all components to ensure nothing was damaged during transport. Verify that the following parts are present and in good condition:

- Chassis base and frame
- All-terrain agricultural wheels (40 cm diameter)
- Monocrystalline solar panels (480 W total output)
- UV attractant bulbs (effective illumination radius: 30 m)
- Dual cooling/suction fans
- Rechargeable 40Ah lithium-ion battery pack

If any components appear damaged, loose, or missing, do not operate the robot. Contact **RamisTech Support** immediately for replacement or assistance.

1

- Robot Insect Hanter
- Robot Insect Hanter
- Large Shippiirnste
- Small Accesories Box
- Large Shipping Box
- Small Accessories Box
- Cardboord Insert

RAMIS

2

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3

On/Off Power Switch

4

5

6. Deployment

Farm Mapping

Use the RamisTech mobile app to upload the GPS-coordinated map of your farm. Select the navigation mode that best matches your field layout:

- **W-pattern** for general pest concentration in open-field, non-row crops.
- **Rectangular perimeter pattern** for treating field borders where insects often accumulate.
- **Row-based navigation** (e.g., for corn, wheat, or orchard rows) to ensure precise movement between crop lines.

The robot will automatically calculate its optimal route based on the selected pattern.

Positioning and Start-Up

Place the Insect Hunter at the designated starting point, typically the field entrance or the first row. Power on the robot and initiate operation using the mobile app. The robot will autonomously navigate the assigned zones, eliminating pests using UV attraction, suction, and the internal high-voltage grid.

Once the mission is complete, the robot will automatically return to its starting position. If the main battery becomes low during operation, the system will automatically switch to the backup battery to ensure uninterrupted performance.

Activate Protection Systems

Enable the built-in safety and security features through the app:

- **Ultrasonic Animal Repeller:** Emits frequencies above or below 20 kHz to deter small animals.
- **Motion & Large-Animal Alerts:** Uses a 360° motion-detection system (7 m radius) to identify approaching animals or movement. Alerts are sent to the user via GSM/GPRS, including location data.

These features help protect both the robot and surrounding wildlife while maintaining safe operation in open farm environments.

7. Operation

- **Scheduling:**
  Use the mobile app to schedule **nighttime operation** for best performance. UV light attracts most insects in low-light and dark conditions, so evening and nighttime hours are recommended.
- **Activation:**
  Start the robot from the mobile app. When activated, the UV lamps attract insects, and the dual-fan system draws them into the main chamber, where an electric grid eliminates them. Any insects that survive the initial cycle are neutralized by a secondary zapper located in the collection tray. Always ensure the protective safety switch is enabled; this system

automatically shuts off the electric grid if a human or large animal is detected near the device.

- **Monitoring:**
Use the app to monitor real-time robot location**,** battery status (approx. 3A consumption during operation), and coverage progress for each farm zone. The system sends instant alerts, along with thermal images, whenever significant motion, large animals, or other warning conditions are detected.

8. RamisTech Mobile Application

The RamisTech mobile app serves as the central control hub for your Insect Hunter robot. It allows you to manage operations, customize settings, monitor performance, and respond to alerts directly from your smartphone.

Main Functions

● **Robot Status & Device Management**
Access an overview of all connected Insect Hunter units, including active/inactive status, battery levels, and current operating zones. From this dashboard, you can add or remove robots, power devices on or off, and schedule operation times and days based on your farm's needs.

● **Farm Zone Management**
View the predefined farm zones uploaded during installation. Select which zones the robot should cover during each cycle and track progress as areas are completed. This feature allows precise, targeted pest-control planning across large or segmented fields.

● **Tray Emptying Options**
Choose your preferred insect-chamber emptying mode.

- **Automatic Mode:** The robot empties the chamber when full or at the end of its scheduled work period.
- **Manual Mode:** You trigger emptying directly through the app whenever needed. This ensures efficient operation during peak pest-activity periods.

● **Alert Notifications & Activity History**
Enable real-time notifications for motion detection, large-animal intrusion, or any unusual activity around the robot. Each alert includes the time, GPS location, and a thermal image snapshot for verification. A full history log is available for reviewing past alerts and operational events.

1.Download application

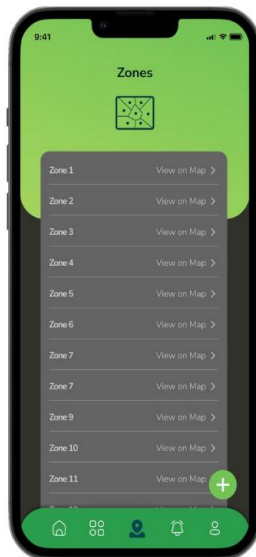**2. Sign in using the user and password.**

3.Select the Robot
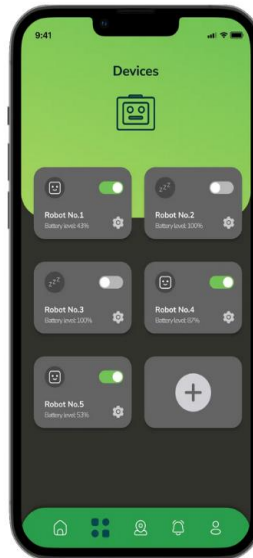
4.Check Robot Status

5.Set Auto Start Time

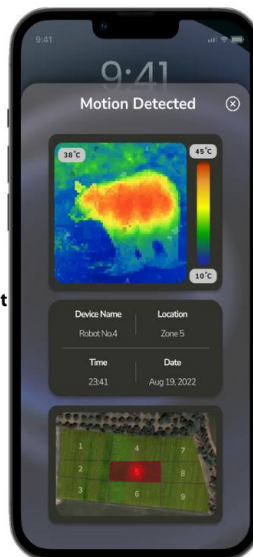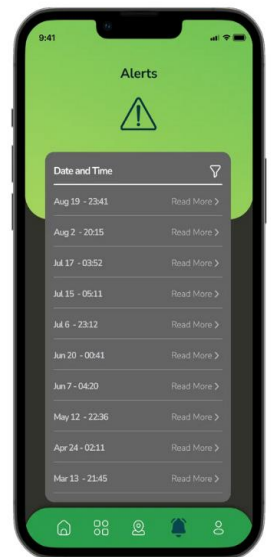**6.Upload zones**

7.Set Zones & Directions

8.Motion Detected Alert

9.Check Alert History

9.   <u>Maintenance</u>

Daily / After Each Use

● **Visual Inspection**

Examine the robot's exterior, wheels, suspension system, and underside for any mud, debris, or visible damage. Remove dirt buildup using a soft brush or compressed air. Do not use high-pressure water or abrasive tools.

● **Empty the Insect Chamber**

Clear the insect collection chamber after each operating cycle. You may use the automatic emptying feature in the mobile app or manually discharge the tray. Once emptied, clean the internal electrified grids with a damp, non-metallic cloth, only when the robot is fully powered off and disconnected from any charger.

● **Battery Status Check**

Confirm that the battery level remains above 20% before each deployment. Avoid deep discharge, as running the battery to 0% can shorten its lifespan. Recharge the robot and the backup battery as needed to ensure continuous field readiness.

10. Troubleshooting Guide

Problem	Possible Cause	Solution
Robot won't power on	- Battery fully discharged - Loose connection - Faulty power switch	1. Check battery level in app (must be >20%). 2. Place in direct sunlight for 2–4 hours (solar panels). 3. Inspect power switch and wiring. Press firmly. 4. Do NOT open battery compartment – contact support.
Low battery / won't charge	- Dirty solar panels - Shaded location - Damaged solar cells - Battery too hot/cold	1. Clean all 5 solar panels (see Maintenance). 2. Move to full sunlight, avoid shadows. 3. Check for cracks on panels. 4. Ensure ambient temp is 0–45°C. 5. Run app diagnostics → "Power System". 6. If battery swells or smells, evacuate area and call support.
Robot moves slowly or stops	- Low battery - Wheel stuck/debris - Motor overload - Uneven terrain	1. Charge via solar (4–6 hrs for 50%). 2. Clear mud, vines, or stones from wheels/axles. 3. Reduce payload (max 50kg per wheel). 4. Use on slopes <15° only. 5. Restart via app: Settings → Reboot.
Not attracting insects	- UV lights off/dirty - Blocked suction vents - Low insect activity	1. Clean UV bulbs with dry cloth. 2. Ensure vents are clear (top & side). 3. Operate at dusk/dawn (peak insect time). 4. Check app: UV Mode = ON.
Zappers not working (no	- Power issue - Grid dirty/clogged - Faulty high-voltage	1. Confirm battery >50%. 2. Clean grids only when OFF (damp cloth).

sound/spark)	module	3. Run app test: Zapper Diagnostic. 4. High voltage (7000V) – DO NOT touch grids when on
App won't connect (Bluetooth/Wi-Fi)	- Robot off - Out of range - App outdated - Phone issue	1. Ensure robot is ON (LED indicator). 2. Stay within 10m (Bluetooth) or same Wi-Fi. 3. Update app (iOS/Android store). 4. Restart phone & robot. 5. Re-pair: App → Settings → Forget Device → Reconnect.
Robot veers off path / gets stuck	- Dirty sensors - Uneven ground - Low GPS signal - Software glitch	1. Clean front/rear sensors. 2. Avoid muddy/wet fields after rain. 3. Operate in open areas (GPS needs sky view). 4. Update firmware via app. 5. Use Manual Mode to guide out.
Insect chamber won't empty	- Tray full/jammed - Suction blocked - Motor failure	1. Manually open tray (side latch), remove debris. 2. Clear suction tube with compressed air. 3. Run Empty Cycle in app 2–3 times. 4. If motor silent → contact support.
Unusual noise (grinding, clicking)	- Debris in gears - Loose parts - Motor bearing wear	1. Power off. Inspect wheels & suspension. 2. Remove foreign objects. 3. Tighten visible screws (do not over-tighten). 4. Do not disassemble motors – send for service.
Overheating warning (app alert)	- High ambient temp - Blocked airflow - Battery issue	1. Move to shade, let cool 30 mins. 2. Clear vents and fan intake (bottom). 3. Stop use if battery >60°C – risk of fire. 4. Contact support with error code.

11. Warranty & Support

For repairs, replacements, or technical assistance:

📞 **+1 (778) 851 0271**
✉ **info@ramistech.com**

12. Symbols on Packaging

Symbols on packaging indicate:

This Side Up
Two vertical arrows indicate the proper upright position for the carton. The package should never be stored or shipped sideways or upside down.

Handle with Care

Two hands holding a box mean the item is complex or easily damaged. Avoid stacking or rough handling.

Keep Dry

The umbrella icon means the box must be protected from rain or damp storage conditions.

Fragile

A cracked wine glass or the word *Fragile* signals delicate contents such as glass, electronics, or ceramics. Handle with extra care.

Flammable Materials

The flame symbol means the package contains flammable or combustible materials. Keep away from sparks, fire, and heat sources.

Temperature Sensitive

A thermometer symbol indicates that the product must be kept within a specific temperature range.

This side up	Handle with care	Keep dry
Fragile	Flammable materials	Temperature sensitive