# C4i
## communication

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# ANTI DRONE SOLUTIONS

**CATALOG**

# Handheld UAV Detector

## Model:C4I-U500



C4I-U500 comes with a quick-release clip that can be used to carry on the MOLLE Tactical Vest.

## Introduction:

C4I-U500 is a handheld device equipped with GPS and UAV detection features. It can accurately detect mainstream brand UAVs, DIY UAVs, and FPV UAVs within its effective range through in-depth analysis of UAV signals and feature recognition. The device alerts through vibration and sound. In the premium versions, C4I-U500 can identify mainstream UAVs and retrieve their type, SN code, and the locations of both the UAV and the pilot. It has a compact handheld design, making it easy to carry, and it operates automatically when powered on. The device features a large 4-inch color LCD display, versatile mapping capabilities, connectivity features, and flexible power options, enabling one-handed operation for optimal functionality.

# Specifications:

| | |
|---|---|
| **Working mode** | Radio monitoring and signal analysis (No signal transmission, strong concealment) |
| **Detection frequency** | 12 selectable signal bands by default (Supports opening up other frequency bands in the 70-6000MHz range) |
| **band Detection range** | 1-2km (There are differences depending on the environment and the target transmit power) |
| **Satellite navigation function** | The following navigation systems are supported: BDS B1I, B2a GPS L1C/A, L5 GLONASS G1 Galileo E1, E5a QZSS L1, L5 |
| **Spectrum Active Detection** | Supports active detection of environmental spectrum data Supports real-time spectrogram and spectrum display |
| **Device size** | 225*78*43mm  (Antennas not included) |
| **Device weight** | ≤900g |
| **Endurance time** | ≥4h (Screen lighting mode), ≥6h (Screen off mode) |
| **Operating Temperature** | -20ºC to 50ºC |
| **Storage temperature** | -40ºC to 70ºC |
| **Protection class** | IP55 |

# Key Features:

- Mainstream brand drones signal signature recognition capabilities

- 4-inch LCD screen, the screen display supports outdoor sunlight environment, and adopts key interactive operation.

- Sound and vibration alarms, can be switched on and off through software settings.

- Spectrum display of detected frequency bands, with selectable maximum and minimum hold, to capture suspected signal data.

- Target information list and target number display (including frequency, model and other information)

- Historical alarm information list, model statistics, alarm trend statistics

- Battery power display function, battery with quick removal and installation capability

- Standard map and satellite map switching function

- GNSS positioning capability, while supporting manual setting of current position

- Self-diagnostic test when the device is switched on, displaying the working status (normal or abnormal) through the software, with abnormal status prompts.

- The device automatically starts the detection task when it is switched on, without human intervention.

- Device detection data, work logs and other data can be stored and accessed.

- Compatible with MOLLE tactical clips when equipped with a belt clip.

- Power supply interface, external power supply can be independently powered.

- Language setting function, with Chinese and English supported(additional languages can be added upon request).

- Supports software upgrades and updates via side Type-C port or TF card.
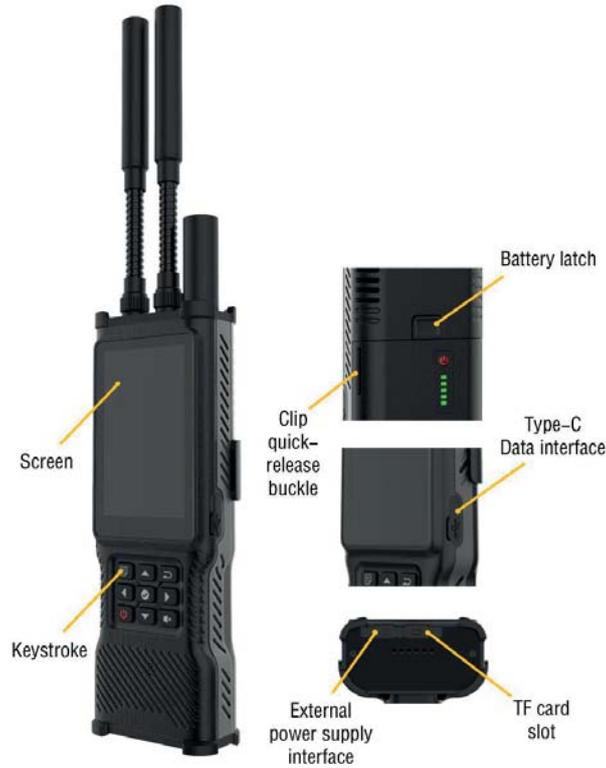
## Composition:

The detachable part of the C4I-U500 handheld UAV detection device is composed of the main unit, battery, detection antenna, GNSS antenna, and quick-release back clip.

The interactive buttons and external interfaces of the C4I-U500 handheld drone detection device are shown below.

# Portable UAV Detection & Jamming system

## Model:C4I-GTUS-IIP

## Description

The system is equipped with a 2.8-inch bright IPS LCD screen, which has the function of detecting the orientation and model of the drone, and has the function of interfering with the frequency band used by the drone, which can drive the drone away or force the drone to land, and completely cut off the contact between the drone and the remote control or the ground station to ensure the safety of the low-altitude airspace in the region. Compared with common portable control equipment, this device adds device positioning and networking functions, and can link the back-end command system to facilitate the background command personnel to make transfers according to the distribution of equipment.

## Technical Specification

| Position Function Parameter | |
|---|---|
| Module type | High-precision L1, 15 dual-frequency GNSS receiving module |
| Position system | Beidou, GPS |
| PPS search accuracy | ±15ns |
| Maximum speed | 515m/s |
| Speed accuracy | 0.1m/s |
| Dynamic heading Angle accuracy | 0.3 |

| Networking function parameters | |
| --- | --- |
| Communication method | UART |
| Communication frequency band | 868MHz |
| Transmission power | 1w |
| Transmission distance | 2km |
| Encryption method | AES dynamic encryption |
| **Detection technical parameters** | |
| Detection frequency | Dual frequency 2400~2485MHz, 5150~5950MHz |
| Detection antenna gain | 2dBi |
| Detection power consumption | ≤5W |
| Detection mode | Omnidirectional detection, directional detection |
| Detection distance | 1-2km |
| Number of detections | Multiple targets |
| Detection and identification | Commonly used UAV types |
| Warning mode | Sound, vibration |
| **Jamming technical parameters** | |
| Operating frequency | 900 ~ 930MHz, 1550 ~ 1620MHz, 2400 ~ 2500MHz, 5715 ~ 5850MHz |
| Output power | 150W |
| Signal style | DSSS(spread spectrum) /FHSS (frequency hopping) |
| Battery capacity | 2 pieces of 7000mah lithium batteries |
| Endurance | ≥30 minutes (continuous launch); ≥120 minutes (30s launch and 90s stop) |
| Product weight | About 4.5kg |
| Product size | Host: 690*300*80mm |
| Working mode | Expel/Forced land mode; Each module can be individually controlled on and off |
| Screen configuration | 2.8-inch high-lighted IPS screen |
| scope magnification | Maximum 4 times |
| Jamming distance | Flight height 100m: control distance ≥1700m, flight height 200m: control distance ≥2000m |

# Portable UAV Jammer

## Model:C4I-GTUS-II



## Description

The system is equipped with a 2.8-inch bright IPS LCD screen, which has the function of interfering with the frequency band used by the drone, which can Expel or forced land the drones, and completely cut off the contact between the drone and the remote control or the ground station to ensure the safety of the low-altitude airspace in the region. Compared with common portable control equipment, this device adds device positioning and networking functions, and can link the back-end command system to facilitate the background command personnel to make transfers according to the distribution of equipment.

## Technical Specification

| Jammer technical parameters | |
|---|---|
| Operating frequency | 900 ~ 930MHz, 1550 ~ 1620MHz, 2400 ~ 2500MHz, 5715 ~ 5850MHz |
| Output power | 80W |
| Signal style | DSSS /FHSS |
| Battery capacity | 2 pieces of 7000mah lithium batteries |
| Endurance | ≥30 minutes (continuous launch); ≥120 minutes (30s launch and 90s stop) |
| Product weight | About 4.5kg |
| Product size | Host: 690*300*80mm |
| Working mode | Expel/Forced land mode; Each module can be individually controlled on and off |
| Screen configuration | 2.8-inch high-lighted IPS screen |
| scope magnification | Maximum 4 times |
| Jamming distance | Flight height 100m: control distance ≥1700m, flight height 200m: control distance ≥2000m |

# Portable Drone Jammer and Detector Station
## Model: C4I-UDS-IV



## Product Description

The portable detection and control integrated box are equipped with a comprehensive drone management and control system. Through in-depth analysis and data mining of drone signals. The serial number, model, and location (longitude, latitude, and azimuth angle) of the drone within the monitoring range can be determined. Remote control position (latitude, longitude, azimuth) and other multi-dimensional information for monitoring. It also has the function of interfering with the frequency band used by drones, which can drive away drones or make forced landings, completely cutting off the connection between drones and remote controllers or ground stations to ensure the safety of low-altitude airspace in the area.

This equipment is suitable for different applications, such as low-altitude security in major event security, guard tasks, security patrols, special anti-terrorism, political core areas, border defenses, military restricted areas, military management areas, power and petrochemical parks and other scenarios.

# Functions

- Drone monitoring: To obtain the serial number, model, location (latitude, longitude, azimuth), altitude, pilot position (latitude, longitude, azimuth) and other information of the drone within the monitoring range;
- Unique identification (code): It can identify the unique serial number of the drone and confirm the unique identity information of the drone;

- Drone positioning: It can locate the location information of the drone and display the drone's position (latitude and longitude), orientation information, and distance information (the distance of the drone relative to the location of the device) in real time;
- Pilot positioning: It can locate the pilot's position information and display the pilot's (remote control) position (latitude and longitude), orientation information, and distance information (the distance of the pilot relative to the location of the device) in real time;
- Multi-target trajectory tracking: It can position and track drone swarms and display multiple drone flight trajectories at the same time;
- Safety list: It can distinguish cooperative and non-cooperative drones, the device will not alarm when cooperative drones are detected, and can markup cooperative drones as trusted;
- Intrusion alarm: When the device detects a drone intrusion, it will issue an sound and light alarm;
- Trajectory playback: Supports drone flight trajectory playback, assisting security personnel in analyzing historical drone flight data;
- Detection records: The detection record list can retain historical records, including multi-dimensional information, such as drone serial numbers, models and frequencies, etc.;
- Multi-unit network: The equipment can be connected to the back-end management and control platform through the Internet, and the multi-unit network can cover a large area;
- Working mode: Using omnidirectional radio frequency interference antenna Two working modes: expel and forced landing; the control distance is 2km;

## Key Features

- Full range of detection drone models: The system can identify brands of drones such as DJI, Daotong, Dahua, and Haoxiang, as well as most of the models on the market such as FPV drones and WiFi drones;

- Long detection: an open scenario, the detection distance of some models can reach more than 5km;

- Passive detection: the device does not emit any electromagnetic signals, it is electromagnetic environmental friendly;

- Integrated software and hardware: Equipped with drone control platform, it can work independently without configure to the other equipment;

- Mobile and portable: Trolley box-type portable design, small in size, portability;

- Touch interaction: Touch screen, the operation is simple, convenient and fast;

- Dual power supply: The device can be powered by a built-in battery or an external power supply;

- Easy deploy: The device antenna is placed on the top cover of the box, and can be turned on and off by one click;

## Technical Parameters

| | |
|---|---|
| Detection frequency bands | 900M, 1.2G, 2.4G, 5.2G, 5.8G; |
| Detection distance | 1-3km (depending on the environment) |
| Number of detections | ≥5 sorties can be detected and tracked at the same time; |
| Azimuth error | ≤1.5° (RMS) |
| Positioning accuracy | ≤10m |
| Detection success rate | ≥95% |
| Deployment time | ≤90s |

| Recognition response time | ≤5s |
|---|---|
| Backend control mode | wired |
| Strike frequency bands | 900M, 1.5G, 2.4G, 5.2G, 5.8G |
| Control distance | ≤ 2km |
| Power consumption of the whole machine | 840W |
| Power supply | External 220V mains power; Built in 29.4V/33Ah lithium battery |
| Working hours | Test standby time of 24 hours, force landing working time of 70 minutes (continuous work) |
| Charging time | 7 hours |
| Screen size | 10.1 inches |
| Screen resolution | 1080P (1920 * 1200) |
| Equipment size | 65 * 50 * 32cm |
| Equipment weight | 36.6kg |
| Working temperature | - 20°C~65°C |
| Protection level | IP65 |

# Drone detection and control system

## Model: C4I-UAVRF-5



## Technical Parameter:

### I.Detection Part：

1. The equipment can have the functions of locating the drone and the pilot for DJI's latest O4 video transmission.

2. It has the function of receiving analog video transmission of FPV drones.

3. Frequency band support: Supports the 25MHz - 6GHz frequency band.

4. Key frequency band monitoring: 433MHz, 900MHz, 2.4GHz, 5.2GHz, 5.8GHz.

5. Reconnaissance distance: ≥5 kilometers.

6. Direction - finding accuracy: ≤10° (while following); ≤3° (while hovering).

7. Reconnaissance sensitivity: ≥ - 115dBm (25kHz).

8. Reconnaissance airspace: Capable of 360 - degree all - airspace

9. Adaptable communication modulation methods: FM, 2FSK, 4FSK, GFSK, MSK, BPSK, QPSK, 16QAM, 64QAM, OFDM, DSSS, FHSS.

10. Power supply: AC100-240V.

11. Reconnaissance modes: panoramic scanning and channel scanning.

12. Working capacity: Capable of continuous operation 24 hours a day.

13. Passive detection: Only passively receives without emitting any electromagnetic signals. Can detect the drone model and its

14. Accurate orientation: Can accurately determine the intrusion direction of the drone and indicate the target.

15. Precise identification: Can precisely identify different drones of the same brand and model.

16. Unattended operation: When the unattended mode is activated, it can automatically detect and alarm 24 hours a day.

17. Black and white list: Can mark the black and white list with one click. Drones on the white list will not trigger an alarm.

18. Full model library: Supports the full series of DJI drones, mainstream market brands, and DIY drones, covering more than 98% of the models on the market.

## II. Jamming Part：

### 1. With 8 channels：

| Channel | Power | Function |
|---|---|---|
| 410MHZ-470MHZ | 50W | UAV remote control frequency band |
| 830MHZ-940MHZ | 50W | UAV remote control frequency band |
| 1180MHZ-1280MHZ | 50W | UAV video transmission and positioning frequency band |
| 1420MHZ-1460MHZ | 50W | UAV image transmission frequency band |
| 1555MHZ-1655MHZ | 50W | UAV positioning and navigation frequency band |
| 2400MHZ-2485MHZ | 100W | UAV remote control and image transmission |
| 5150MHZ-5350MHZ | 50W | UAV image transmission frequency band |
| 5725MHZ-5850MHZ | 100W | UAV image transmission frequency band |

2. Jamming function: It can emit jamming signals to make the drone return or land (the drone supports return or forced landing function).

3. The time required from starting jamming to the drone being successfully jammed seconds.

4. Jamming distance: In an environment without obvious rain, snow, or fog (without obstructions and without obvious electromagnetic interference), the

device's jamming distance to the drone is not less than 1.5 kilometers.

5. Jamming angle: Horizontal 360º, pitch: -45º to 45º.

6. Precise strike: After networking with radio detection equipment and other devices, it canaccurately strike the designated drone among multiple (no less than 2) drones of the same model, same working frequency band, and same direction without affecting the normal controlled flight of other non-designated drones (requires cooperation with radio detection equipment), and can precisely strike non-white list drones set by radio detection equipment.

7.Networking function: It can be networked with other equipment such as radio detection equipment through wired or wireless means.

8.Protection level: IP65.

9.Operating temperature: -40℃ to +55℃.

## III. Software operating system

### 1. Basic information settings

(1) Spectrum detection setting: Set the connection IP and port of the detection equipment.

(2) Server operation setting: Set the connection IP and port of the strike equipment.

(3) Automatic interference parameters: Set the interference duration and strike interval.

(4) Map online status setting: Set online maps and offline maps.

(5) Whitelist list: Display the drones set as whitelist.

(6) Location setting: Provide two modes, automatic and custom, to set the center point coordinates of the detection equipment.

(7) Custom setting frequency band: Users can set the frequency bands to be opened in expulsion and forced landing according to needs.

### 2. Spectrum detection

(1) Strike log: Record the log information of each interference of the system.

(2) Spectrum detection information: Record all the drone information detected. You can add the drone to the whitelist and export the drone information to Excel for local viewing.

(3) Drone historical trajectory: You can view the historical trajectory of the drone's flight.

### 3. System management

(1) Platform connection setting: Used to set the IP and port of the drone control platform, so that this system can be remotely viewed in the drone control platform.(2) Software version number: Display the version numbers of the software and hardware systems.

### 4. Connection status

(1) Spectrum connection status: The connection status between the system and the detection equipment. Green indicates a successful connection, and red indicates no connection.

(2) Equipment connection status: The connection status between the system and the strike equipment. Green indicates a successful connection, and red indicates no connection.

5. Real-time trajectory: It can display the current real-time flight path of the drone on the map.

6. Sound alarm: After detecting a drone, an alarm sound can be emitted to indicate that the area is under threat.

7. Detection circle: A blue circle detection area with a radius of 5 kilometers is displayed on the map.

8. Defense circle: A red circle defense area with a radius of 2 kilometers is displayed on the  map.

9. Power amplifier status: Display the frequency band information currently in operation.

10. Working mode: There are two modes, automatic and manual. Automatic mode can realize 24-hour unattended function in conjunction with expulsion and forced landing.

11. Strike control: The default frequency bands for expulsion are 400M, 900M, 1.4G, 2.4G, 5.2G, and 5.8G. The default frequency bands for forced landing are 400M, 900M, 1.2G, 1.4G, 1.5G, 2.4G, 5.2G, and 5.8G. Users can also set the frequency band according to the custom module to achieve customized expulsion and forced landing.

12. Drone list: For DJI drones, it can display information such as drone model, drone ID, frequency, azimuth, drone distance, discovery time, drone location, drone altitude, pilot location, pilot distance, etc. According to the navigation QR code, path planning for the pilot location can be achieved by scanning with WeChat. For DJI drones that support precise strikes, precise strikes can be implemented. For non-DJI drones, it can display information such as drone model, drone ID, frequency, azimuth, discovery time, and approximate drone location.

13. Networking function: The system can be connected to the Internet, and the strike control capability of this site can be viewed and controlled in the drone control platform. The drone control platform supports PC and mobile terminals.

# Portable UAV Detection Station

## Model：C4I-C1



## Feature

1. Black And White List: The same direction, the same frequency band, the same brand, and the same type of UAV can be listed in black and white.

2. Portable Design: It comes in a suitcase form, making it highly portable and easy to carry around.

## Technical Specs

1. Detection Range: 5000m
2. Working Duration: can work continuously for 4 hours in ideally
3. Waterproof Rating: IP65

## Key Features

1. Focus on 900MHz, 1.2GHz, 2.4GHz,5.2GHz, 5.8GHz
2. Detection Range: 5km
3. Drone ID and Remote ID supported
4. Detection Qty: ≥20 drones (simultaneously)
5. Black And White List
6. Size: 50mm * 420mm * 220mm

# UAV Detection and Control System
## Model: C4I- M20



## Description

The UAV Detection and Control system integrates detection and interference functions. It can detect illegal invading drones by analyzing their spectrum characteristics and Drone ID. It can interfere and block drone signals to force the drone to return or land, through electromagnetic suppression technology.

## Feature

1.  Detection and interference 2in1: High integration, a single device can detect and interfere drones both.

2.  Long Interfere Distance: The max interfere distance can reach to 3km.

3.  Ultra-long Battery Life: Equipped with large-capacity rechargeable battery

4.  Easy to Operate: Small size, light weight, easy to carry

## SPECIFICATIONS

1. Detection Frequency: 300MH-6000MHz

2. Direction Finding Accuracy: ≤30°(spectrum),≤0.5*(Drone ID)

3. Detection Radius: 3km

4. Interference Frequency:433MHz,800MHz,900MHz,1.2GHZ,1.4GHL, 1.6GHz,2.4GHz,5.2GH,5.8GHz

5. Interference Radius: 2km

6. Working Time: Detection standby time:4 hours; Interfere continuous Working time:30 mins

7. Power Supply: Built-in battery, power adapter

8. Working Temperature: -20C-+55℃

9. Product Type: Shield-shaped design

# C4I-3KW Intelligent Laser Anti-drone System



## Product Introduction：

C4I-3KW intelligent laser anti-drone system, comprehensive use of high energy laser, electronic information, image processing and other technologies, to achieve intelligent recognition, high precision tracking, laser damage of far-field drone targets, balloons, birds, kites and other "low slow small" targets, to achieve rapid target disposal. The system can be deployed on a vehicle or fixed on the top of a building.

## Product Function:

（1）It can access the target guidance information such as radar, and according to the guidance information, it can quickly locate and image the target.

（2）Able to fast recognize and intelligent track the drone target.

（3）Through control the high energy laser beam on far field, system able to rapid strike down the drone targets.

（4）Simple operation interface improves the work effectiveness of system. The interface able to monitor the system status and control the functions of laser on, laser off, video, and so on.

（5）Simple disassembly, transportation, assembly and adjustment processes. Easy for deployment.

# Technical Specifications

| No. | Item | Specifications | Comments |
|---|---|---|---|
| 1. | High energy laser emission power | ≥3KW | |
| 2. | Beam quality M² | ≤1.5 | |
| 3. | Output fiber length | 4m | |
| 4. | Main aperture | 50mm | |
| 5. | Effective tracking distance | ≥600m | Taking DJI "Phantoms" asa typical target, under the condition of weak atmospheric turbulence |
| 6. | Effective damage distance | 100~400m | |
| 7. | Damage time | 5s ~ 15s | Since the laser emitted until the target fall. (time influence by the target distance and atmospheric condition) |
| 8. | Ranging distance | ≥500m | The DJI "Phantoms" as typical target |
| 9. | Target intelligent detection | Accuracy≥95% | Intelligent identificationand tracking of drone targets under complex backgrounds (mountains, trees, buildings, etc.) |
| 10. | Target tracking accuracy | ≤15μrad（RMS） | |
| 11. | Continuous laser emission time | ≥120s | |
| 12. | Azimuth angle range | −90º~ +90º | |
| 13. | Pitch angle range | −10º~ +55º | |
| 14. | Maximum tracking speed | 60º/s | |
| 15. | Maximum tracking acceleration | 60º/s² | |
| 16. | Tracking speed to ensure the accuracy | ≥20º/s | |

# System composition

The C4I-3kw system is composed of ATP, laser, power supply battery, chiller and intelligent control computer, as show in the figure below.

# C4I-Intelligent Radar Detection System

The C4I-intelligent radar perception system realizes the detection and intelligent recognition of "low, slow and small" targets such as unmanned aerial vehicles (rotors, fixed wings), helicopters, airborne balloons, birds, etc. in complex ground clutter and sea clutter environments, providing location, velocity and category information of targets, and providing information guidance for disposal methods such as laser damage and electronic interference. The most advantage technical feature of the system is the use of deep modeling technology, which can achieve intelligent recognition of targets such as drones, helicopters, birds, etc. With a recognition accuracy of 95%, it can greatly reduce the workload of people in the loop.

The functions include:

1) With azimuthal circumferential sweep/sector+pitch electric sweep mode for airspace target detection and tracking;

2) Deep learning capability of target images, using deep learning algorithms for recognition of target micro-Doppler feature maps to achieve high recognition rates of targets;

3) It can report 3D position and 3D velocity information of the target in real time;

4) It can predict the target flight path;

5) Software background, with the function of information interaction with the overall control software;

6) Support device startup self-test, status monitoring, automatic fault diagnosis display and report functions.

7) With automatic, all-weather working ability, the radar system can be unattended, reduce the difficulty of work, and avoid electromagnetic radiation interference to the operator.

# 1. System specification

| No. | Item | Specification | Comments |
|---|---|---|---|
| 17. | Radar band | X-band | |
| 18. | Maximum detection distance | ≥5km | Typical target is DJI phantom series, the target RCS area is 0.01m2 |
| 19. | Minimum detection distance | ≤200m | |
| 20. | Minimum speed of detectable target | 2m/s | radial velocity |
| 21. | Recognition accuracy | Based on radar signals, it can intelligently identify targets such as drones, birds, balloons, and civil aviation with an accuracy rate of ≥95% | |
| 22. | Maximum recognition distance | ≥2km | |
| 23. | Data update rate | 6s | |
| 24. | Detection coverage | Azimuth 0º～360º， Pitch 0º～30º | |
| 25. | Positioning accura | Azimuth accuracy≤0.6º， Pitch accuracy≤0.6º ， Distance accuracy≤10m | 1σ |
| 26. | Target capacity | ≥200 units | |
| 27. | Emission power | ≤30W | |
| 28. | Average power | ≤300W | |
| 29. | Power supply | AC220V/50Hz | |
| 30. | Data interface | Gigabit Ethernet | |
| 31. | Size | ≤1020mm×270mm×410mm (Length x width x height） | |
| 32. | Weight | ≤35kg | |
| 33. | Weight (Intelligent processing device) | ≤10kg | |
| 34. | Working temperature | −30℃～+60℃ | |
| 35. | Storage temperature | −50℃～+70℃ | |
| 36. | Protection level | IP65 | |
| 37. | Humidity | 95%±3%（30℃, non-condensation） | |

## 2. System composition

The C4I-intelligent radar detection system consists of two parts: the radar (including tripod) and the intelligent processing device, as shown in the diagram below.



Figure 1 Intelligent Radar Detection System Composition

The C4I-intelligent radar detection system extracts the micro-Doppler motion features of typical targets such as drones and birds from the medium frequency signals, and then realizes the rapid intelligent recognition of targets such as drones, birds, floating balloons and helicopters through the customized deep neural network recognition network, with the recognition accuracy of better than 93%. And the system can quickly form the target situation, has the advantages of high intelligence, accuracy and efficiency, and able to solve the problem of high false alarm rate of target radar detection in complex scenes.
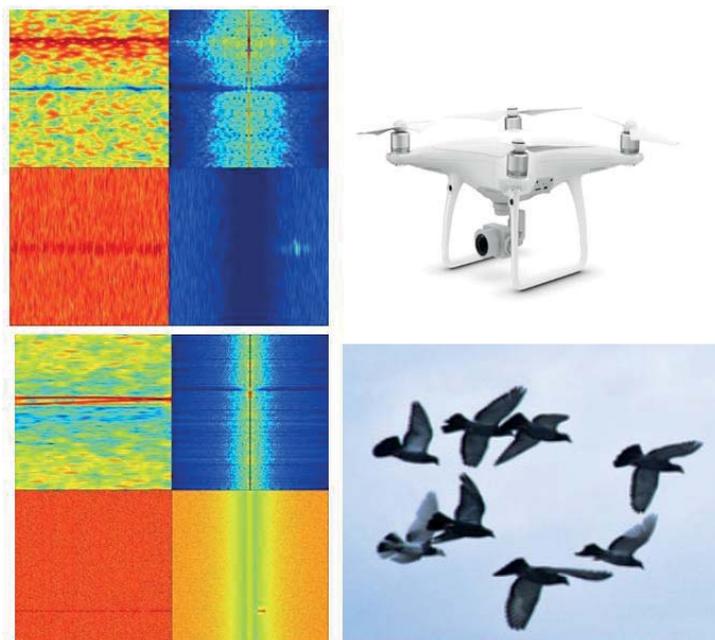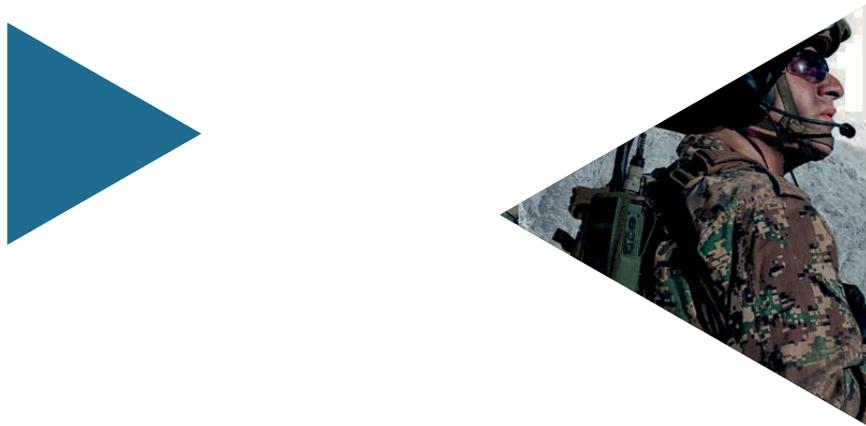


Figure 2 Information difference between bird and UAV in radar medium frequency signals

**Figure 3 Multi-type target intelligent recognition test in complex urban**



**Figure 4 Multi-type drone target intelligent recognition test in complex urban environment**