

UAV/DRONE DEFENSE

INTERNATIONAL
ARMOUR
Co.
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TDOA Drone Defense Management Platform

Product Profile

Drone Defense Management platform provides 7*24 hours drone monitoring and early warning, identification and positioning, agile countermeasures, data statistics and system integration services.

The platform is based on a cloud-native architecture and can be deployed in public clouds, private clouds or local servers according to customer needs.

User logs into the management console through a web page to obtain the identity information and flight trajectory of drones in the control area in real time.

When an unwanted drone is found invading the protected area, the platform will intelligently assist in decision-making and link countermeasures to precisely strike it to make it fly away or make a forced landing.





TDOA Drone Defense Management Platform

Features

REMOTE OPERATION

Supports multi-user, cross terminal remote login and concurrent use.

VISUALIZED UI

Drone location and tracking with visualized and intuitive data displaying..

INTEGRATED MANAGEMENT

Differentiated labeling of cooperative / non-cooperative targets, unified supervision

BIG DATA ANALYTICS

Multi-dimensional statistical analysis of data, conducive to scientific decision-making.

MULTI ZONE HIERACHICAL DEFENSE

Customized multiple defense zones.

ELASTICITY

Any number of terminals integration and data fusion

DJI and non DJI

Mainstream, DIY, FPV, racing drones included


MULTI TARGET TRACKING

Can locate and track drone swarm.

INTELLIGENCE & COMMAND IN ONE

Situational awareness, intelligence analysis, decision-making assistance, command and dispatch integration.

The platform is accessible through all kinds of terminal devices



TDOA X4

Drone Detection System



TDOA X4 Drone Detection System

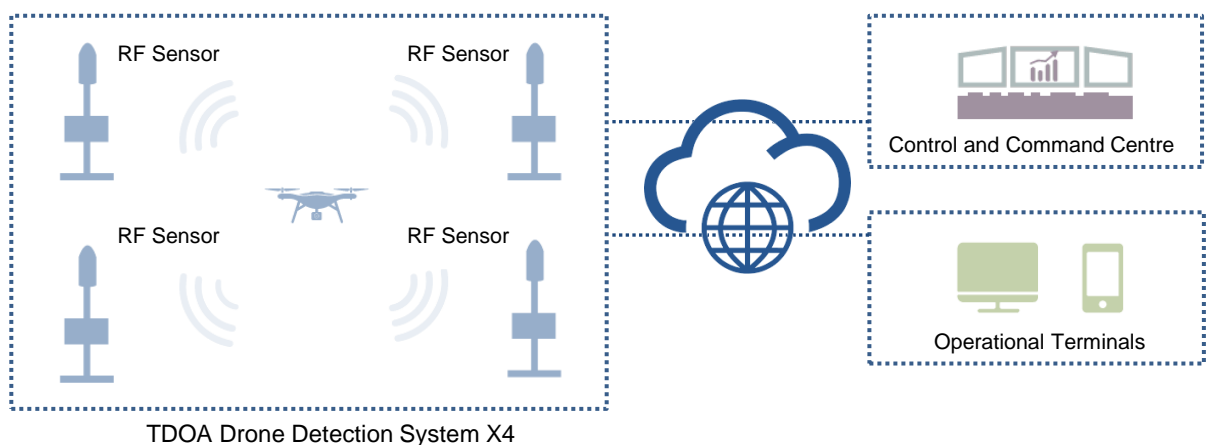
A standard TDOA X4 consists of 4 RF sensors and a management suite.

The system is based on industry-leading RF sensing and TDOA positioning technology with functions such as drone detection and early warning, drone model identification, positioning, tracking and trajectory playback.

It can freely expand to consist any number of RF sensors.

The RF sensors collect and recognize suspicious surrounding drone signals, and use the time differences between the signal of reaching different sensors to continuously locate and track the target.

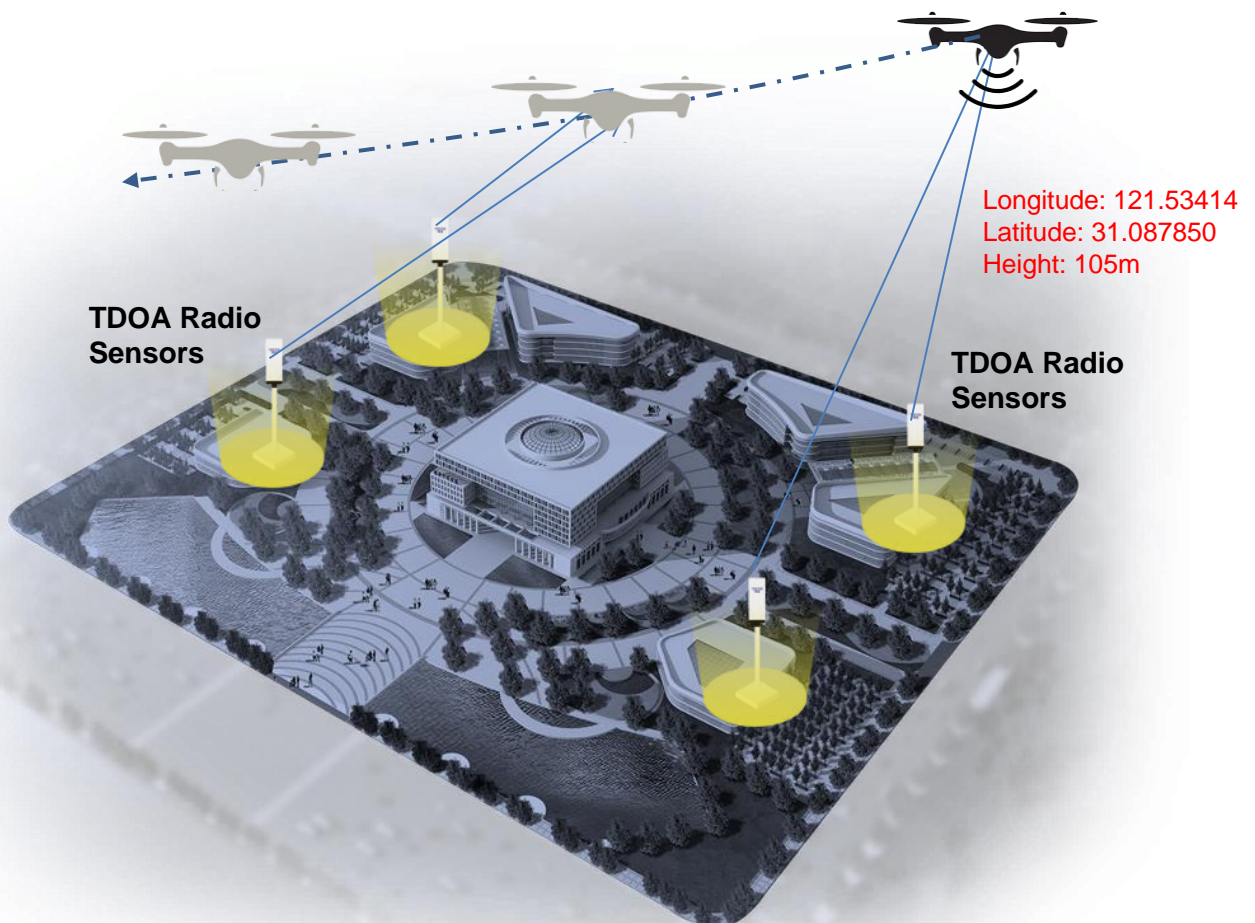
Typical System Architecture





TDOA X4 Drone Detection System

Typical System Deployment



Suitable for lower airspace protection of governmental and military venues, major events, confidential facilities, chemical and petrol parks, airports, border control etc.



TDOA X4 Drone Detection System

Features



TDOA Passive technology

Passive detection technology, no signal emission, highly covert



DJI and non-DJI

Various drone types, DJI series, Wifi, FPV etc.



Wide Coverage

4 sensors network covers 4 - 15km²



Super-wide frequency coverage

100MHz – 6GHz



Black and white list

Able to identify cooperative and non-cooperative drones



Drone swarm tracking

Support multiple target positioning with independent real-time trajectory displaying

WORK MODE: Passive TDOA positioning

TARGET: Drone image-transmission signal


FREQUENCY: 100MHz – 6GHz

COVERAGE: 4 sensors network covers 4 -15km²

LOCATION ERROR: ~ 20m

NUMBER OF TARGETS: 10+ (simultaneously)

FALSE ALARM RATE: <once per day



TDOA X5

Drone Defense System



TDOA X5 Drone Defense System

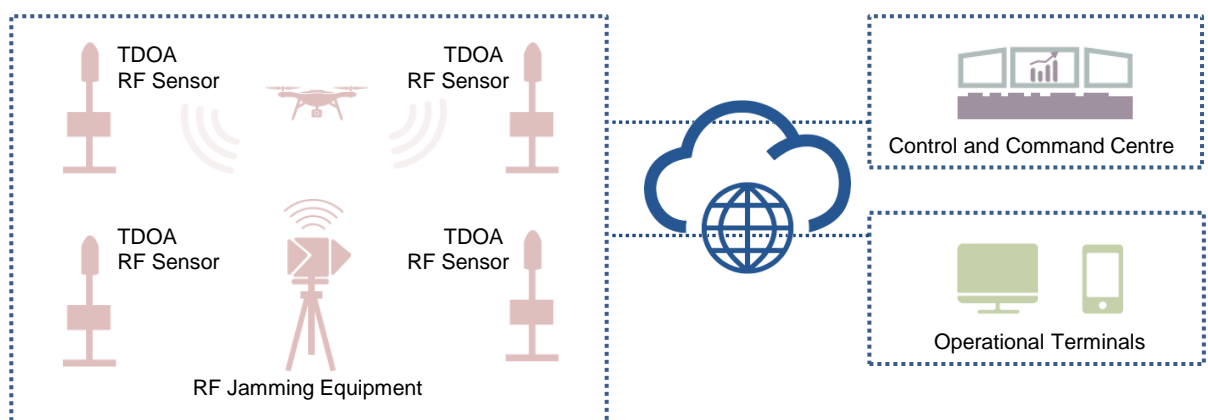
A standard X5 DDS consists of 4 RF sensors, 1 RF jammer and a management suite. The system features UAV detection and identification, location, tracking and countermeasure.

It is highly scalable to freely expand to consist any number of TDOA RF sensors and radio jammers.

The system can detect and identify drone signals. Multiple RF sensors can be networked flexibly to locate the signal source via TDOA algorithm.

Based on the location results, the system autonomously links one or more radio jammers to automatically transmit jamming signals to effectively cut off the drone's communication commander navigation link, thus drive away or force it to ground.

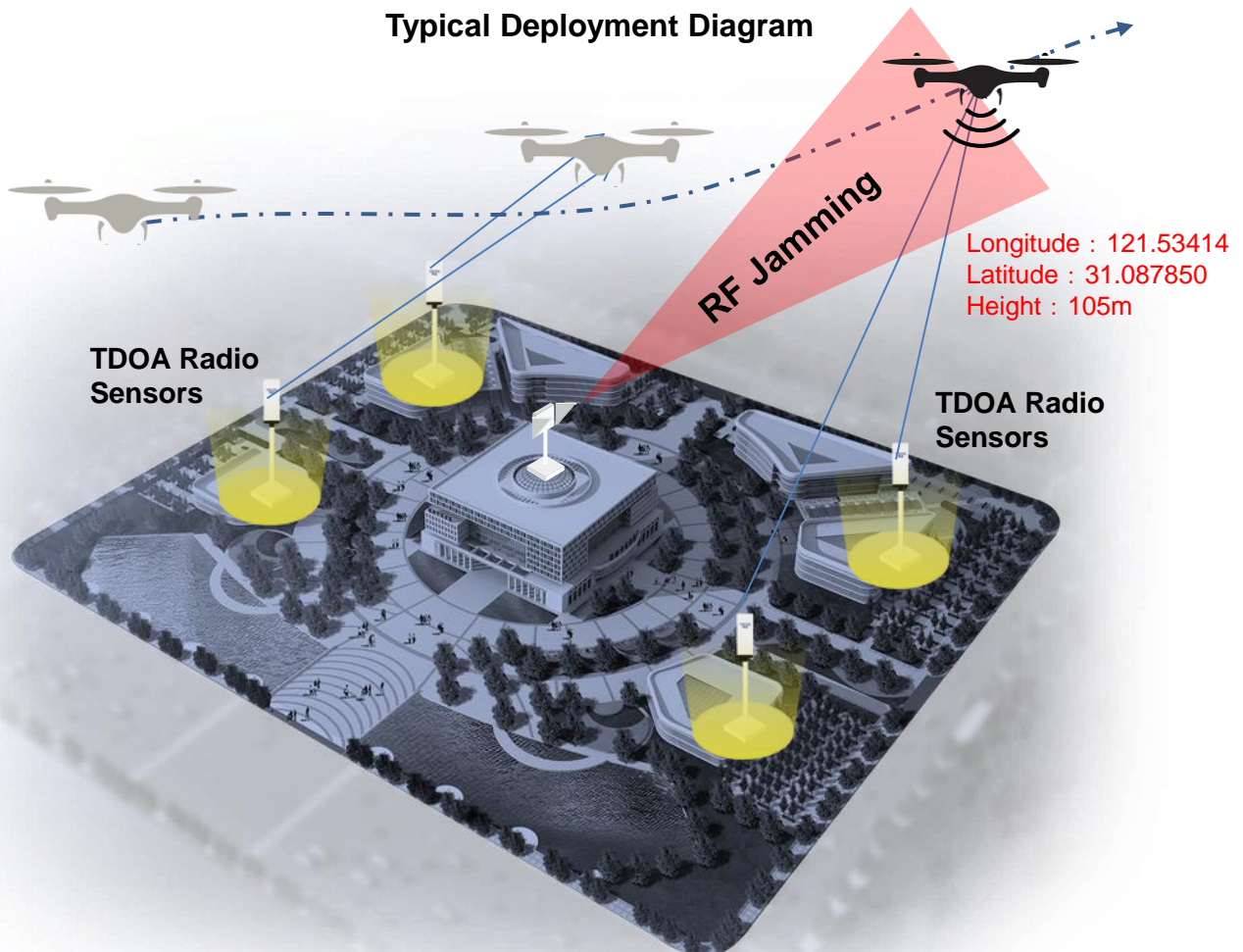
Typical System Architecture





TDOA X5 Drone Defense System

Typical Deployment Diagram





TDOA X5 Drone Defense System

Features

SIX IN ONE

Drone detection, classification, location, tracking, countermeasure, strategy planning.

AUTONOMY

Autonomously links detection to countermeasure, few artificial intervention required.

MEGA AREA

Can network to seamlessly cover a mega city.

TDOA PASSIVE RF DETECTION

Passive technology, no signal emission, highly covert.

ABLE TO ID DIJ DRONES

Able to ID DJI, WiFi and other non-typical drone types up to 200+ types with low false alarm

WHITE LIST & BLACK LIST

Able to ID cooperative drones from uncooperative ones.

MULTI TARGETS

Multiple drone targets identification, tracking and countermeasure with real time drone trajectory displaying

SUPE WIDE SPECTRUM

Spectrum coverage
100MHz ~ 6GHz.

MULTI LAYER DEFENSE STRATEGIC

Multiple defense layers customizable.



TDOA X5 Drone Defense System Specifications

Detection and identification equipment

WORK MODE: Passive TDOA RF detection and location

TARGETS: Drone control link and image transmission link

FREQUENCY: 100MHz – 6GHz

COVERAGE: 4 sensors network covers 4-15 km² (Varies due to drone models and environment)

LOCATION PRECISION: ~20m

NUMBER OF TARGETS: ≥10+ (simultaneously)

FALSE ALARM RATE: <once per day

Countermeasure equipment

WORK MODE: RF jamming

TARGETS: Control and GNSS signals

FREQUENCY: Typical drone frequency, including 900MHz, 1.2GHz, 1.5GHz, 2.4GHz, 5.8GHz

COVERAGE: 1 jammer covers 1-5 km² (Varies due to drone models and environment)

TIME TO RESPONSE: <4 seconds

Applications in Critical facilities, major events, petrochemical parks, railways, border control



TDOA

Multi-layered
Drone Defense
System



TDOA

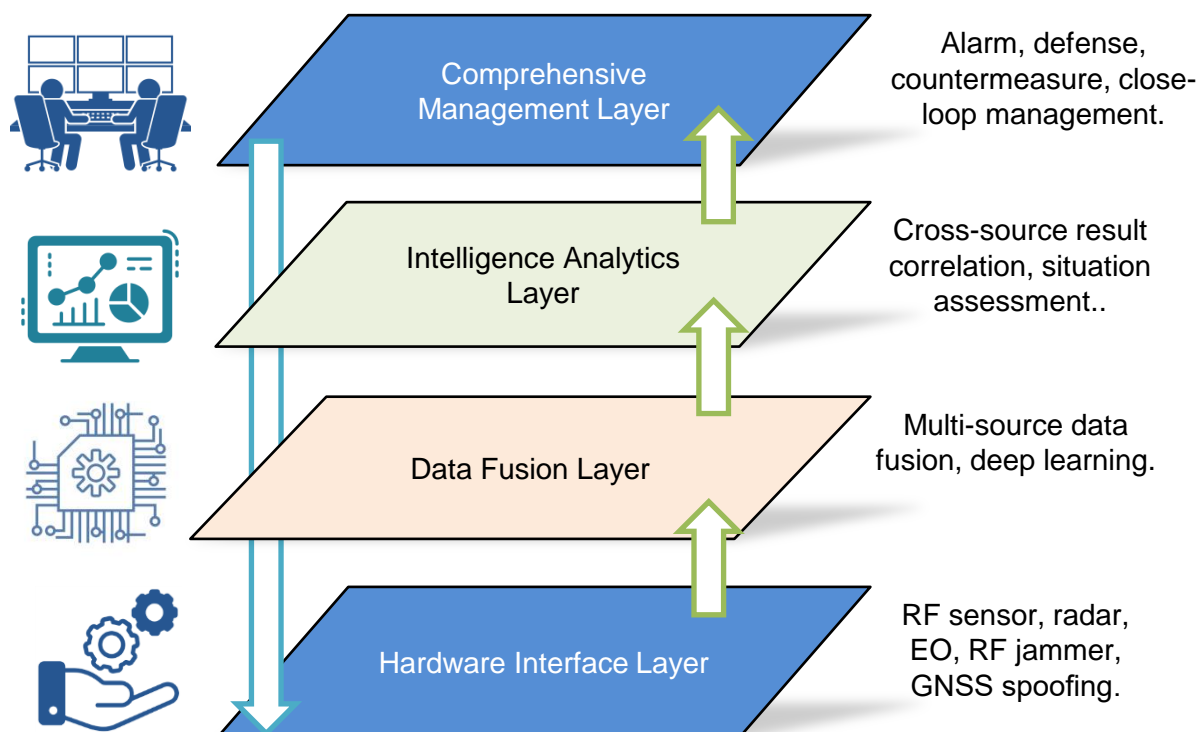
Multi-technology Converged Drone Defense System

Comprehensive use of various technologies including passive RF sensing, radar, electro-optic, RF jamming, GNSS spoofing etc. to detect, discover, position, track and dispose unwanted drones, thus form a comprehensive multi-layered lower airspace defense system.

Based on TDOA passive RF sensing, supplemented by radar, photoelectric technologies, the system monitors lower airspace targets in real-time.

After identifying and locking the target, it can automatically link radio jammers or GNSS spoofing devices to dispose the target.

System Architecture



Suitable for lower airspace protection of governmental and military venues, major events, critical S-infrastructures etc.



TDOA

Multi-Technology Converged Drone Defense System

Features



TDOA-based multi-source convergence

RF sensing, radar, EO converged.



Data Fusion

Multi-source data fusion for better decision-making.



Efficient linkage

Automatic detection and countermeasure linkage.



Unified control and command

Unified management of all detection and countermeasure equipment, coordinated command and dispatch.



Multi-level protection

Take a variety of means to jointly defend the core area for comprehensive protection.



Multi-level defense

User can customize multi-layer defense strategy.



Seamless coverage

Multiple sensors integrated for blind-zone-free coverage..



Flexible planning

Easy-to-use defense strategy planning tools.



Easy to expand

Standard APIs for multi-source integration..



TDOA

City-scale
Networking Drone
Defense and
Management
System



TDOA City-scale Networking Drone Defense and Management System

The system can be used as a new type of infrastructure for urban airspace management.

Through smooth expansion, it can monitor and manage city-scale large area 24/7 to ensure safety and order of urban lower airspace.







Deploy a number of smart RF sensors across a large area, multiple adjacent sensors can network to form a sensing grid. Many such sensing grids then converge into a city-scale lower airspace monitoring network. The system can flexibly set up multiple key protection zones.

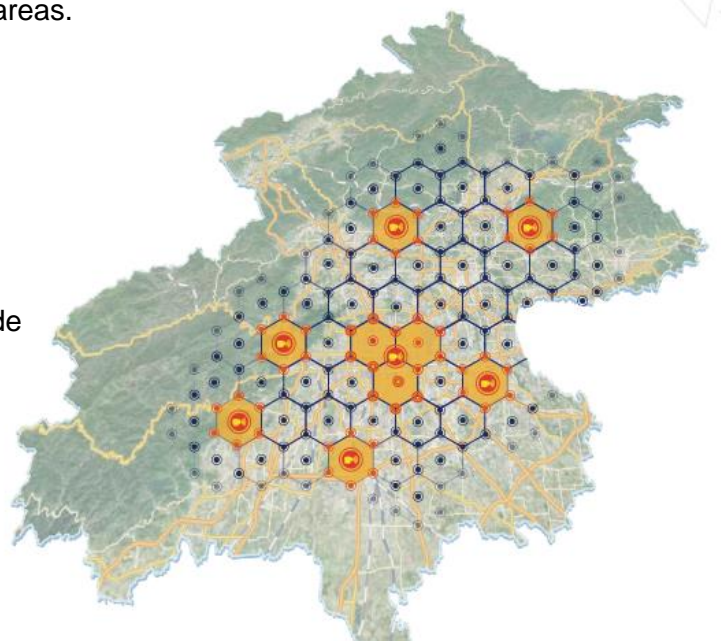
The detection, recognition and long-distance early warning of drones are realized through sensing nodes, the precise positioning of targets is realized based on TDOA algorithm.

The two major advantages of the system "information sharing" and "data fusion" are fully utilized to continuously track and lock targets across regions.

In order to prevent unwanted drones trying to break into the key protected zones, the system quickly links countermeasure units to handle targets to achieve efficient management and control of large areas.

Typical Deployment

-  Key protection zone
-  A sensing grid area
-  TDOA radio sensing node
-  Countermeasure unit
-  A sensing grid
-  1-2KM radius



TDOA City-scale Networking Drone Defense and Management System

Features



Able to cover city-scale large area

City-scale large area coverage. .



Data Fusion

Fusion of monitoring data from different grids.



Efficient linkage

Smart linkage between detection and countermeasure. ..



Data sharing

Data from different grids can be shared in real time, breaking information silos.



Elasticity

Flexible scaling-up.



Multi-level defense Strategy

Customizable multiple denfense zones.



Multi-target tracking and handling

Support multi-target tracking and positioning, real-time trajectory display.



Autonomy

7x24 hours artificial running, integrated detection and countermeasure, autonomous countermeasure.



Blacklist and whitelist

Able to distinguish cooperative/non-cooperative drones.



TDOA passive detection

Passive detection technology, no signal emission, highly covert.



Super-wide frequency band monitoring

Frequency coverage 100MHz - 6GHz



Fast response

Response time <4s.



Frequency coverage

Cover typical drone frequency.



Large area precise management

Directional jamming, targeted countermeasure.



DJI and non-DJI

Various drone types, DJI series, Wifi, FPV etc.

TDOA X1B Drone Detection Equipment

Work mode: Radio detection,
Detection target TDOA Drone image transmission and control
signal
Frequency: 100MHz-6GHz
Range: Detection radius 2-6 kilometers
(There will be some differences depending on
the environment and model)
Target number : 10+ Simultaneously



A single X1B equipment can independently discover and identify drones. Multiple devices can be networked to achieve precise positioning and trajectory tracking of drones based on TDOA radio positioning technology.

The equipment adopts a specialized antenna design which features super frequency bandwidth, long detection range, strong anti-interference capability and integrated industrial design. It is suitable for deployment in complex urban environment.

TDOA-based passive detection

TDOA-based passive
detection technology,
no signal emission ,
environment friendly

Long range coverage

Detection radius 2-6 kilometers
(There will be some differences
depending on the environment and
model)

Strong anti interference capability

Stable running under
urban environment

Fully coverage of drone types

Able to identify 200+
drone types including
Dji, WiFi, FPV etc

Low false alarm rate

Average false alarm
rate < once per day

High refreshing rate

Average detection result
refreshing time < 1s

Drone positioning

Multiple equipment can
network to conduct
TDOA-based positioning

White and black list

Able to identify cooperative
and non-cooperative drones

Integrated design

Easy to deploy and use

TDOA X1D TDOA+AO Drone Detection Equipment

TDOA X1D

Frequency: 100MHz to 6GHz

Azimuth error: up to 10°

Detection range: 2 to 5km (Varies due to environment and drone model)

Direction-finding range: 2 to 4km (Varies due to environment and drone model)

Dimension: Φ *H: (420*530)±10mm

Weight: Aprox 15Kg

Protection Grade: IP65

Working temperature: -30°C to +65°C

X1D TDOA+AOA Drone Detection System

X1D is a drone detector with drone intrusion alarm identification, direction-finding and networking location capabilities.

One signal device detects and finds drone direction. Multiple X1Ds network to locate drones via TDOA (time difference of arrival) algorithm.

It emits no signal which makes it interference-free and suitable for urban environment.

Drone Location

Multiple X1D network
to locate drones

Direction Finding

Single X1D finds drone
direction

Drone Model Identification

Able to Identify mainstream
Drones as well as FPV, DIY

Spectrum Monitoring

Able to scan signal within
100MHz to 6GHz

Jamming Interconnection

Able to link with jammers
for automatic jamming

Networking

Able to scale up via
networking



X1C Drone Detection Equipment



X1C is a stationary device for drone detection and location. Through radio spectrum big data analytics, it identifies drone model, S/N code, coordinates (longitude, latitude, altitude) as well as pilot coordinates.

It works independently offline or with multiple devices networking to cover a larger area. It can be interconnected with drone neutralization equipment such as radio jammers, GNSS spoolers etc.

Not just DJ

DJI, Autel as well as homemade, FPV, WiFi drone models

Location

Locates drones and pilots

Drone ID

Identifies drone S/N

Black and whitelist

Classifies “friend” and “foe”

Drone tracking

Tracks multiple drone flight trajectories simultaneously

Networking

Multiple devices can network to cover a larger area

Detection and neutralization linkage

Can interconnect with drone neutralization equipment

Full protection

Full-time, all-weather, no blind-zone

Work mode: Radio frequency
Detection target: Drone image-transmission and control signals
Frequency: 900MHz, 1.2GHz, 2.4GHz, 5.2GHz, 5.8GHz
Range: 1-10km (Varies due to environment and drone model)
Swarm detection: ~10 (concurrent)
Location error: ~10m
Protection grade: IP65
Work temperature: -20~65°C
Dimension:: L*W*H : 513mm*462mm*187mm
Weight: ~30kg

Drone threats mitigation for airports, critical industrial facilities, military compounds, major event venues, borders etc.

RD1 Drone **RID Reader**



RD1 is a drone remote ID (RID) broadcasting signal reader.

It monitors drone flight information such as SN, model, coordinates (latitude, longitude), velocity, altitude etc. based on decoding the broadcasting RID signal.

It's suitable for cooperative drone monitoring for various scenarios such as airports, railways, industrial compounds, major event venues etc.



Drone Location

Monitor and display drone location as well as flight path

Pilot Location

Monitor and display controller location

Multiple Targets

Monitors multiple targets simultaneously

Linkage

Able to link with drone jammers for automatic threat neutralization

City-wide

Supports large quantity nodes networking for city-wide coverage

Protocols

Bluetooth 4/5, WiFi Beacon/NAN

Standards

GB 42590-2023, ASTM F3411 Remote ID ASD-STAN prEN 4709-002

Work mode: RID receiving and decoding

Range [1]: 1-2 km (radius)

Response time [2]: 2- 3s

Swarm monitoring: ~10 concurrent

Dimension: L*W*H : (385mm*307mm*204mm)

Weight: ~15kg

Protection Grade: IP65

Work temperature-30°C~65°C

Note: [1] and [2] only works to drones with RID transmission

D2C Drone **Detection & Jamming** Integrated Vehicle mounted



D2C is an integrated device featuring drone detection, identification, pilot location and jamming based on radio sensing and suppression.

D2C can extend to 13 jamming frequency bands with an extra JM1 jamming module. Different bands can be controlled separately or combined.

**Not
just DJI**

DJI, Autel as well as
homemade, FPV, WiFi
drone models

Location [1]

Locates drones and
pilots

Drone ID [2]

Identifies Drone S/N

**Black and
Whitelist [3]**

Classifies "friend"
and "foe"

**Detection
mitigation
in one**

Automatic linkage
between detection and
neutralization

**Mission on
the move**

Able to mitigate drone
threats on the move

The equipment is suitable for mobile law enforcement protection in scenarios such as secret services, anti-terrorism, public security patrols, cultural and sports activities, border and coastal defense

Note: Features [1][2][3] only work to certain drone models, for more details please refer to specs document.

JM1 is a separate optional jammer accessory, see its details from the specs document.

D2C Drone **Detection & Jamming** Integrated Vehicle mounted



Detection unit specifications

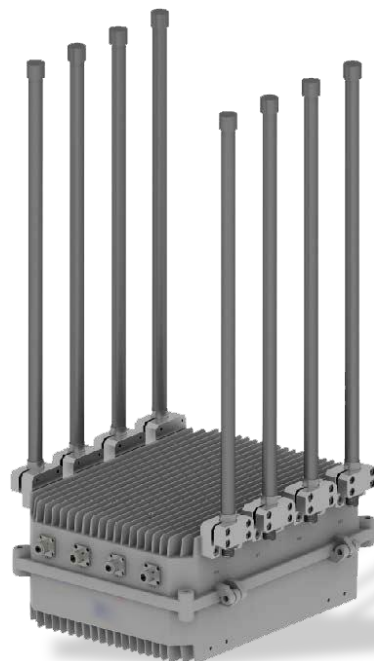
- Work mode: Passive radio sensing
- Target: Drone image-transmission signal
- Range: 1 – 5km (Varies due to environment and drone model)
- Drone frequency: 100MHz-6GHz
- Location error: ~ 10m
- Location result refresh time: ~ 3s
- Swarm Detection: ~ 10 drones (concurrent)

Neutralization unit specifications

- Work mode: Radio jamming
- Target: Drone control and/or navigation signal
- Range: 1 – 2km (Varies due to environment and drone model)
- Jamming Frequency: 900MHz、1.5GHz、2.4GHz、5.2GHz、5.8GHz
- Weight: +/- 30kg (Excluding power supply)
- Dimension: Φ *H: 600mm*420mm ~3s
- Jamming mode: Omnidirectional/Directional

JM1 Specifications (optional accessory)

- Extensional bands: 433MHz, 840MHz, 915MHz, 1.1GHz, 1.2GHz, 1.4GHz, 1.8GHz, 5.SGHz
- Range 1 - 2km
- Dimension L*W*H(399mm*339mm*164mm)
- Weight: =<22kg



JM1

