VENDOR DATA SHEET
AGENCY CONTRACT - SERVICE/MAINTENANCE

1. Firm: Unmanned Aerial Specialists, LLC

   Address: 4728 Adams Road, Suite 101, Hixson, TN 37343

2. Orders to be mailed to:

   Firm: Unmanned Aerial Specialists, LLC

   Address: PO Box 10, Hixson, TN 37343

3. Payments to be made to:

   Firm: Unmanned Aerial Specialists, LLC.

   Address: if by United States Postal Service: PO Box 10, Hixson, TN 37343

   if by courier (such as UPS, Fedex, etc.): 4728 Adams Road, Suite 101
   Hixson, TN 37343

4. Contract Administrator:

   Name: Mike Hickman

   Title: Vice-President Sales and Marketing

   Address: 4728 Adams Road, Suite 101, Hixson, TN 37343

   Telephone: (423) 713-5500 Toll Free Phone (if available) n/a

   Fax Number: (423) 847-0156 E-mail address: mhickman@ua-sp.com

5. Cash Discount n/a % _____ Days

6. Payment Terms: Net 30 Days

NOTE: All EXCEPTIONS to the terms and conditions should be noted on a separate sheet as in accordance to paragraph 3 of the Request for Quote, additional Instructions.

Contract #_46700-469188_____

EFFECTIVE DATE: June 1, 2017

EXPIRATION DATE: May 31, 2018

STATE OF GEORGIA
SERVICE/MAINTENANCE CONTRACT

Agreement made this 1st day of June 2017, by and between the **Georgia Department of Corrections**, hereinafter referred to as the Agency, and Unmanned Aerial Specialists, LLC., hereinafter referred to as Unmanned Aerial Specialist (UAS) as Vendor.

WHEREAS, bids have been solicited for the sale of the services listed herein to the named Agency of the State of Georgia; and

WHEREAS, the State has determined that the Vendor above named is the lowest responsible bidder (one of the lowest responsible bidders) on such services within the statutory meaning of that term;
NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, it is agreed as follows:

1. CERTIFICATION.
The State does hereby certify the Unmanned Aerial Specialist (UAS) as a source of supply for the services listed herein to the Agency pursuant to the provisions of the Purchasing Act (Official Code of Georgia Annotated, Chapter 50-5).

2. PAYMENT.
The Agency shall pay the amount set out in the attached Schedule for any service provided. Payments shall be made each month per the proposal.

3. PRICE.
The prices quoted listed on the attached Unmanned Aerial Specialist proposal shall be firm throughout the term of this Contract.

4. TERM.
The term of this contract shall be one year from the date of installation, agency training and operation, and testing as agreed upon by the agency and the supplier. All services provided to the Agency during said term shall be billed at the contract price.

5. DELIVERY
The services shall be rendered by the Vendor to the Autry State Prison, 3178 Mount Zion Church Road, Pelham, GA 31779.

6. CANCELLATION
The State reserves the right to cancel this contract by giving the Vendor thirty (30) days written notice of its intent to do so.

7. RENEWAL.
The State may, at its discretion and with the written consent of the Vendor, renew this contract for four or more additional terms.

8. EXTENSION.
In the event that this contract shall terminate or be likely to terminate prior to the making of an award for a new contract for this commodity, the State may, with the written consent of the Vendor extend this Contract for such period as may be necessary to afford the State continuous service as provided by this Contract, pursuant to Article VI, Section 16 of the Georgia Procurement Manual.

9. NON-EXCLUSIVE CONTRACT.
This Contract is entered into solely for the convenience of the State of Georgia, and it in no way precludes the State or any of its user agencies from obtaining like services from other vendors upon prior approval of the Department. Such approval shall be made at the sole discretion of the Department, and shall be conclusive. Such approval shall only be granted when it is deemed to be in the best interest of the State to do so.

10. COMPLIANCE WITH STATUTES.
The Vendor shall comply with all laws, ordinances, rules and regulations of any governmental entity pertaining to the supply of goods and services to the User Agency pursuant to this Contract.

Contractor certifies that the Contractor is not currently engaged in, and agrees for the duration of this Contract not to engage in, a boycott of Israel, as defined in O.C.G.A 50-5-85

11. APPLICABLE LAW.
This Contract shall be governed in all respects by the laws of the State of Georgia.

12. TRADING WITH STATE EMPLOYEES.
This Contract does not and will not violate the provisions of the Official Code of Georgia Annotated Section 45-10-20 et. seq.

13. ADDITIONAL TERMS.
Neither the State nor any Agency shall be bound by any terms and conditions included in any Vendor packaging, invoice, catalog, brochure, technical data sheet, or other document which attempts to impose any condition in variance with or in addition to the terms and conditions contained herein.

14. ASSIGNMENT AND DELEGATION.
This Contract or any performance required by it shall not be assigned or delegated in whole or in part without the express written consent of the State.

15. GEORGIA PROCUREMENT MANUAL.
The provisions of the Georgia Procurement Manual are incorporated herein by reference and made a part hereof just as if it had been fully set out herein. Provided, however, that in the event of a conflict between the terms and conditions contained therein and the terms and conditions of this Contract, the latter shall govern.

16. WAIVER.
The waiver by the State of the breach of any provision contained in this Contract shall not be deemed to be a waiver of such provision on any subsequent breach of the same or any other provision contained in the Contract. No such waiver or waivers shall serve to establish a course of performance between the parties' contradictory to the terms hereof.

17. REQUEST FOR QUOTE AND AWARD.
The terms, conditions and specifications of the Request for Quote and the award made in connection with this Contract are incorporated herein by reference and made a part hereof just as if they had been fully set out herein.

18. ANTITRUST ACTIONS.
For good cause and as consideration for executing this Contract or placing this order, Vendor acting herein by and through its duly authorized agent hereby conveys, sells, assigns, and transfers to the State of Georgia all rights, title, and interest to and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of Georgia relating to the particular goods or services purchased or acquired by the State of Georgia pursuant hereto.

19. DRUG-FREE WORKPLACE.

A. If Contractor is an individual, he or she hereby certifies that he or she will not engage in the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana during the performance of this contract.

B. If Contractor is an entity other than an individual, it hereby certifies that:

(1) A drug-free workplace will be provided for the Contractor's employees during the performance of this contract; and

(2) It will secure from any subcontractor hired to work in a drug-free workplace the following written certification: "As part of the subcontracting agreement with (Contractor's Name), (Subcontractor's Name), certifies to the Contractor that a drug-free workplace will be provided for the subcontractor's employees during the performance of this contract pursuant to paragraph 7 of subsection B of Code Section 50-24-3."

C. Contractor may be suspended, terminated, or debarred if it is determined that:

(1) The Contractor has made false certification hereinabove; or

(2) The Contractor has violated such certification by failure to carry out the requirements of Official Code of Georgia Section 50-24-3.

20. **INSURANCE REQUIREMENTS** - Coverages, Limits and Endorsements

A. COMMERCIAL GENERAL LIABILITY INSURANCE POLICY (CGL)

All contractors shall procure and maintain a Commercial General Liability Insurance Policy, including products and completed operations liability, and contractual liability coverage covering bodily injury, property damage liability and personal injury. The policy or policies shall name the officers, agents and employees of the State of Georgia as additional named insured, but only with respect to claims which are not covered by the Georgia Tort Claims Act, O.C.G.A. 50-21-20 et seq. (Supp 1992). The CGL policy must provide primary limits for any claims not covered by the Georgia Tort Claims Act. However, the CGL policy must indemnify the State for any claims covered by the Georgia Tort Claim Act. The policy or policies must be on an "occurrence" basis unless waived by the State. The CGL policy shall include contractual liability coverage. The CGL policy purchased by the contractor must be issued by a company authorized to conduct business in the State of Georgia or by a company acceptable to the State if the company is an alien insurer. The CGL policy must include separate aggregate limits per project. **Excess liability coverage may be used in combination with the base policy to obtain the below limits.**

Limits: $500,000 per Person
$500,000 per Occurrence

B. BUSINESS AUTOMOBILE LIABILITY INSURANCE POLICY (BAP)

The contractor shall procure and maintain a BAP with liability limits of not less than $500,000 per person and $500,000 per occurrence or a policy with a Combined Single Limit of not less than $500,000 covering any owned, non-owned or hired autos. **Excess liability coverage may be used in combination with the base policy to obtain these limits.**

C. WORKERS' COMPENSATION INSURANCE

To insure the statutory limits as established by the General Assembly of the State of Georgia. (NOTE: A self-insurer must submit a certificate from the Georgia Board of Workers' Compensation stating the Contractor qualifies to pay its own workers' compensation claims.) The workers' compensation policy must include Coverage B- Employer's liability limits of:

Bodily Injury by Accident - $500,000 each accident
Bodily Injury by Disease - $500,000 each employee
Bodily Injury by Disease - $500,000 policy limit

Excess liability coverage may be used in combination with the base policy to obtain these limits. The contractor shall require all contractors and subcontractors performing work under this contract to obtain an insurance certificate showing proof of Workers' Compensation Coverage.

D. INDEMNIFICATION AGREEMENT

Contractor hereby waives, releases, relinquishes, discharges and agrees to indemnify, protect, save harmless, the State of Georgia (including the State Tort Claims Trust Fund and other self insured funds) and all of it's State entities, and all respective officers, employees, directors and agents of and from any and all claims, demands, liabilities, losses, costs or expenses for any loss including but not limited to bodily injury (including death), personal injury, property damage, expenses, and attorneys' fees, caused by, growing out of, or otherwise happening in connection with this contract, due to any act or omission on the part of the contractor, it's agents, employees or others working at the direction of contractor or on it's behalf, or due to any breach of this contract by the contractor, or due to the application or violation of any pertinent Federal, State or local law, rule or regulation by the contractor. This indemnification applies whether: (a) the activities involve third parties or employees or agents of the contractor or of the State entity; (b) the State is partially responsible for the situation giving rise to the claim; provided, however, this indemnification does not apply to the extent of the sole negligence of the State of Georgia and its officers or employees. This indemnification extends to the successors and assigns of the contractor, and this indemnification survives the termination of the contract and the dissolution or, to the extent allowed by law, the bankruptcy of the contractor. If and to the extent such damage or loss as covered by this indemnification is covered by the State Tort Claims Fund (the "Fund") established and maintained by the State of Georgia Department of Administrative Services (DOAS), the contractor agrees to reimburse the Fund for such monies paid out by the Fund. To the full extent permitted by the Constitution and the laws of the State of Georgia and the terms of the Fund, the contractor and its insurers waive any right of subrogation against the State of Georgia, its officers, employees and agents, the Fund and insurers participating thereunder, to the full extent of this indemnification.

21. ENTIRE AGREEMENT.

This Contract, as executed and approved, shall constitute the entire agreement between the parties, and no change in or modification of this Contract shall be binding upon the State or any Agency unless the change or modification shall be in writing, consented to and approved by the Department.

22. SPECIAL TERMS AND CONDITIONS

(Attached are any special terms and conditions to this contract, if applicable:)

IN WITNESS, WHEREOF, the parties have executed this Contract on the date first written above.

Unmanned Aerial Specialists, LLC.

Vendor

Mike Hickman, VP of Sales

Vendor Signature

GEORGIA DEPARTMENT OF CORRECTIONS

Charles Henry Smith, Jr., Agency Procurement Officer, MBA, CPPO, CPPB, GCMP

GDC Representative

GDC Signature

Unmanned Aerial Specialists

Proposal

Exclusively for: **Georgia Department of Corrections**
Nathan Katzif
PO Box 1529
Forsyth, GA 31029

1690-1
June 2, 2017
Georgia Department of Corrections
EXPIRATION DATE **June 15, 2017**

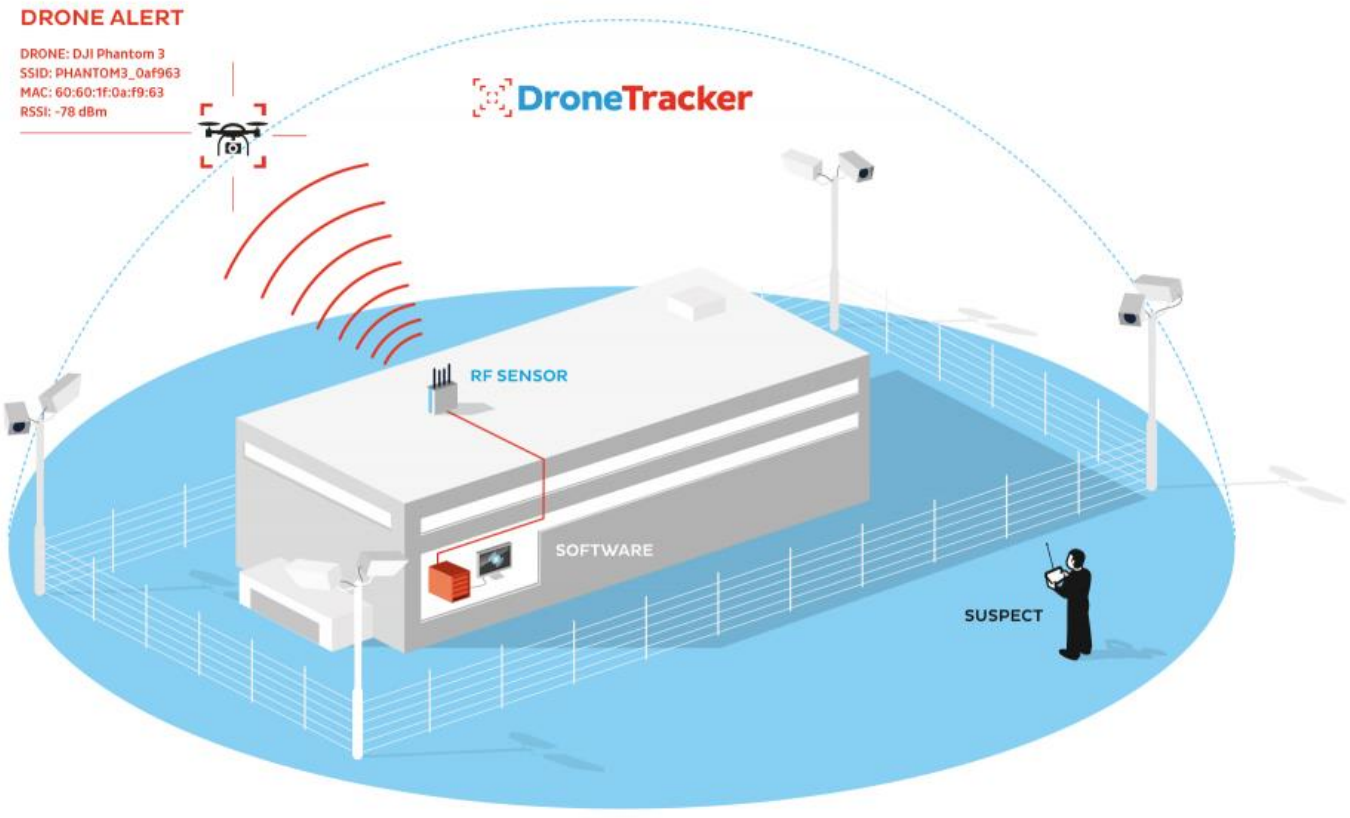
ITEM #	DESCRIPTION	Price	Quantity	LINE TOTAL
DTRF-01-SW	DRONETRACKER Software license for drone classification. 1 year auto-renew includes support.	$5,000.00	1	$5,000.00
DTRF-01-RFHW	RF WiFi enable drone classification sensor with Omni directional antenna.	$11,000.00	1	$11,000.00
Shipping	Origination San Francisco, cA	$100.00	1	$100.00
Installation	n/a			
			TOTAL	$16,100.00

THANK YOU FOR YOUR BUSINESS!

Unmanned Aerial Specialists, LLC.
4728 Adams Road, Suite 101
Hixson, TN 37343
423-713-5500 office
423-847-0156 fax
www.UA-SP.com
Point of Contact: Mike Hickman / Shane Loyd

GEORGIA
DEPARTMENT OF CORRECTIONS





March 20, 2017

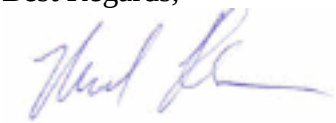
Mr. Steve Upton,
Director, Field Operations
Georgia Department of Corrections
PO Box 1529
Forsyth, GA 31029
404-656-4661

Mr. Upton,
Thank you for the opportunity to review and propose Counter UAS systems for the Georgia Department of Corrections.

As we discussed, the capability of drone detection is readily available. The key to building a comprehensive platform for detection and ultimately mitigation, can be approached from a phased in perspective. An initial phase consisting of detection software and accompanying RF and WiFi sensor(s) with a large detection area will assist you in determining the frequency of drone events occurring on-site. The frequency of occurrences should be used to determine a threshold upon which to base moving to a second phase of detection. The second phase consists of integration of PTZ/other sensors into the detection software. The primary difference between phase 2 and phase 1 is the ability to pinpoint a drone's location within the coverage zone. As in any configuration for surveillance management, more cameras/sensors provide greater ability to detect objects in the field of view. However, I will work with the state to ensure the maximum value of any solution.

I am very thankful you have chosen Unmanned Aerial Specialists to assist you in your selection of the DroneTracker counter-UAS solution. Our goal is to be a total solution provider and build clients for life. If you have any questions, please do not hesitate to reach out to me.

Best Regards,



Mike Hickman

Michael Hickman ‖ Vice-President, Sales and Marketing ‖ UAS
Office: 423-713-5500
Mobile: 423-227-0471
mhickman@ua-sp.com
www.ua-sp.com

UAS

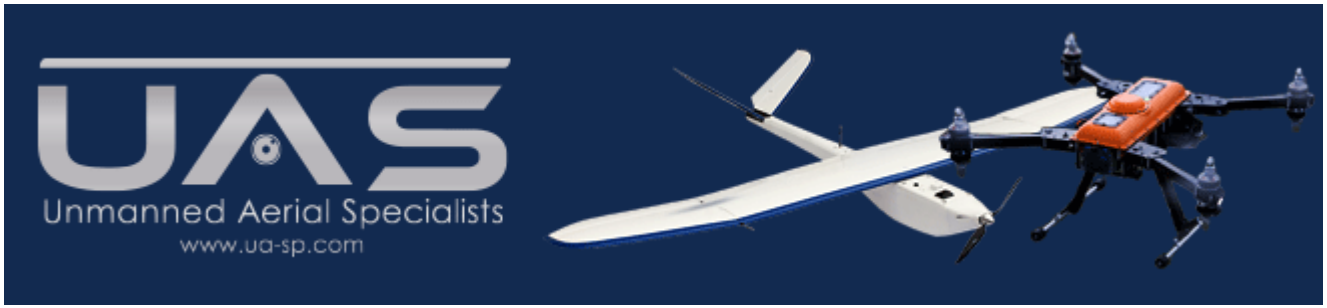
Dedrone

AN EXTENSION OF PHYSICAL AND CYBER SECURITY INTO THE AIRSPACE



About Us

- Unmanned Aerial Specialists was founded to specifically address the needs of the growing UAV industry.
- UAS represents Dedrone, cUAS solutions and multiple lines of high quality drones and payloads
- Our process is to assist our clients in finding the best system for their need without bias to a specific company. We are dedicated to our clients for the lifetime of their business.
- In 2015, we received our 333 drone flight exemption from the Federal Aviation Authority through our parent company. As of 2016 we have two pilots certified for CFR 107 rule for sUAS.



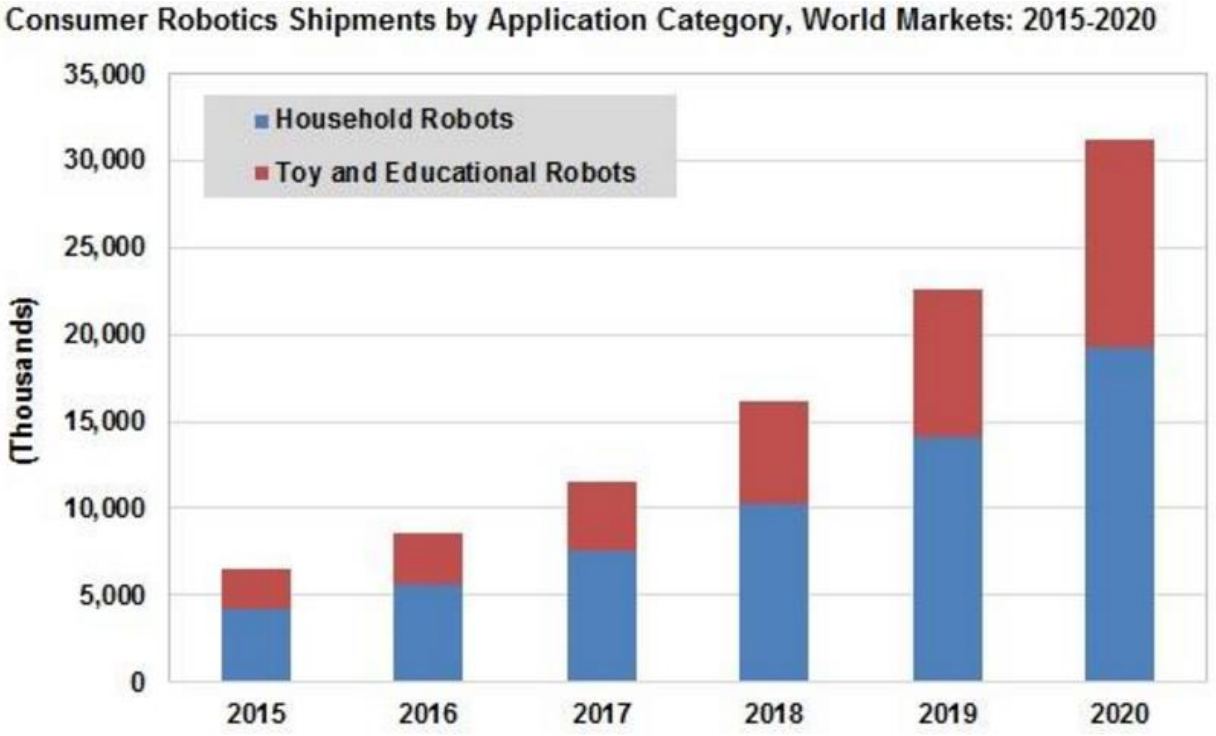
Why DroneTracker?

Safe detection of aerial intrusions



Consumer Drone Market Is Growing Rapidly

Global drone market



- <80% market growth since 2015
- Annual unit sales expected to top 12MM in 2017
- 2017: Largest drone manufacturer DJI estimated valuation tops $10 Billion.

(Source: Tractica)

Drones Present A Huge Threat To Physical & Cyber Infrastructure

Espionage, Hacking, Surveillance, Smuggling &Terrorist activities



Smugglers Drone: Physical/Cyber



Surveillance Drone: Physical/Cyber



Modified IED Drone: Physical



Hacker Drone: Cyber

Maximum Payloads

Terrorist activities, espionage, invasion of privacy and smuggling



Drones' Capabilities

Drones Becoming More and More Powerful

Capability	High Values
Range	30 miles
Speed	100 mph
Payload	14 kg
Control	pilot/autopilot
Orientation	GPS, visual, ultrasonic
Smallest size	2 inch
Biggest size	60 inch
Flight time	4 hours

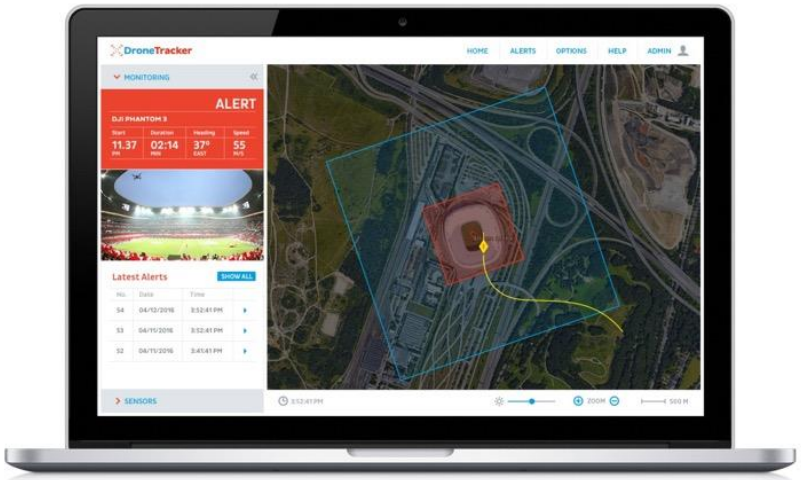
The Solution

Aerial Intrusion Detection Platform



Software Is The Key!

Maintaining a healthy security system requires a product that can be effective both proactively & reactively.

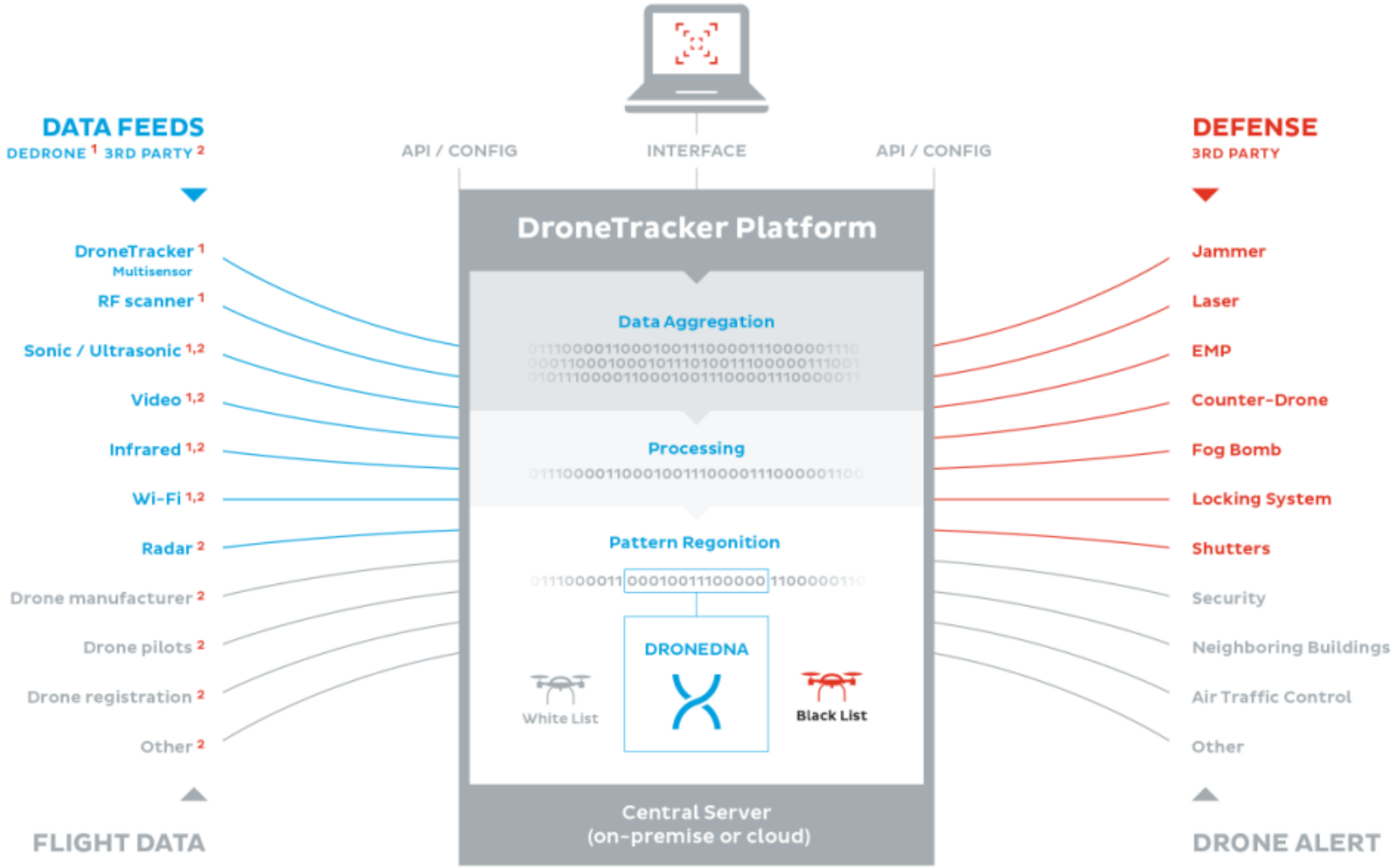


The DroneTracker Platform provides:

- ✓ **Multi Sensor Analysis**
- ✓ **Automated Alarm & Notification**
- ✓ **Automated Push To 3rd Party API's**
- ✓ **Extensive Drone DNA Database**
- ✓ **Swift Cross Referencing**
- ✓ **Future Proofed**
- ✓ **Scalable**
- ✓ **Locally Stored Forensic Evidence**

DroneTracker

Data Aggregation Platform Tailored To Hunt Drones

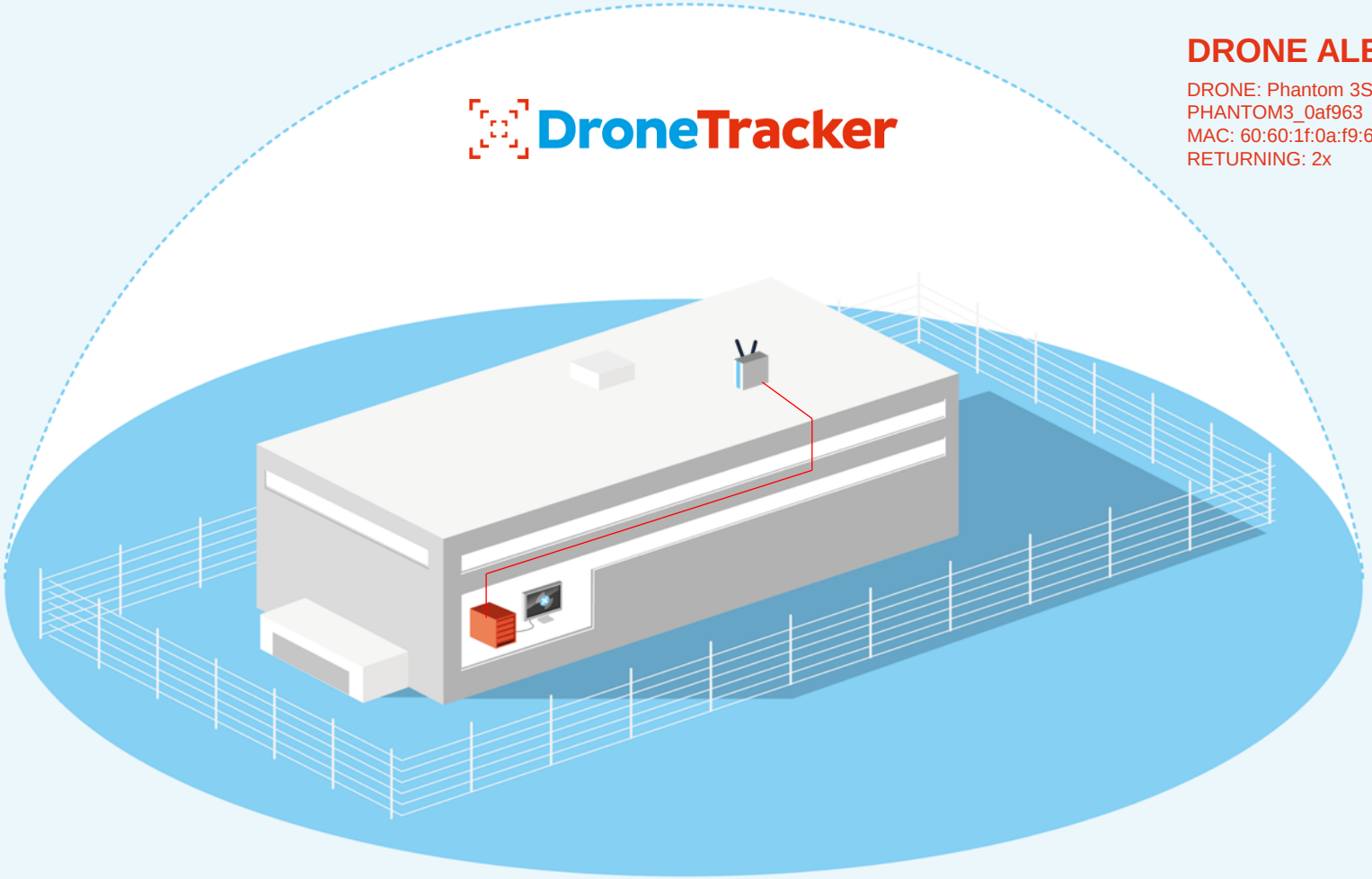


Threat Assessment – RF Detection

DroneTracker

DRONE ALERT

DRONE: Phantom 3SSID: PHANTOM3_0af963
MAC: 60:60:1f:0a:f9:63RSSI: -78 dBm
RETURNING: 2x



Phase 1: Threat/Vulnerability Assessment

- **GOAL: Data collection**
  - *How often, what type, repeat offenders?*

- **COMPONENTS: RF/WiFi Sensor**
  - *Foundational sensor*
  - *Highly accurate*
  - *Drone profile (Type, MAC Address, time in airspace, signal strength/proximity)*

- **OUTCOME: Complete airspace visibility**



DroneTracker RF/WiFi Sensor

- Software Defined Radios (SDR)
- Sensing, detection and decoding
- WiFi

New RF Detections

- **Identifies a large number of other drones, including those of the manufacturer**

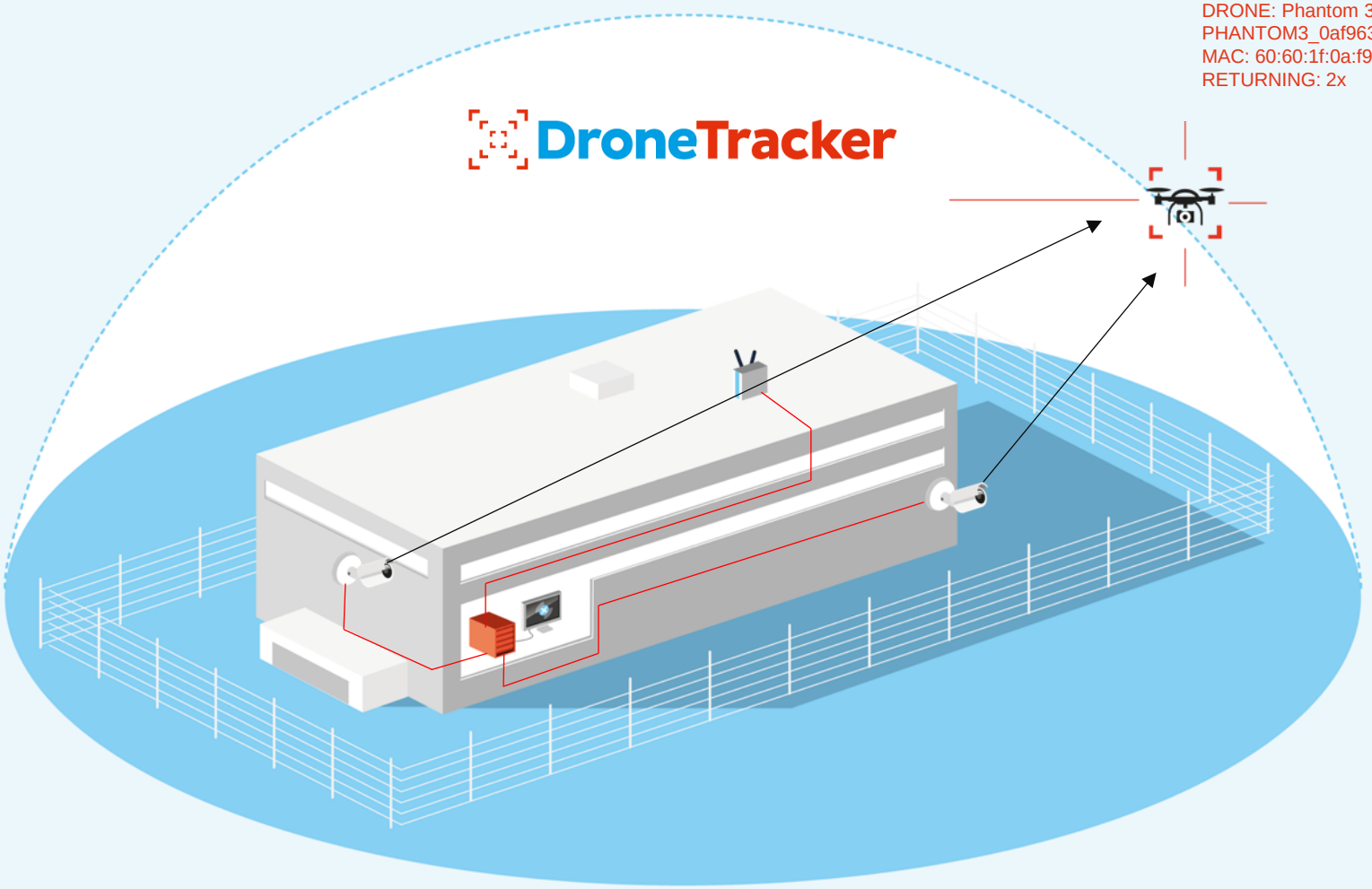
- Detect signals from the communication protocol **MAVlink**, which allows the DroneTracker System to determine and record the **exact GPS coordinates of the drone**

MAVLINK
MICRO AIR VEHICLE COMMUNICATION PROTOCOL

- Detect signals from the communication protocol **Graupner**, which allows the DroneTracker System to detect and decode the transceiver address for Drone and Remote

Graupner

Situational Awareness – Additional Sensors/Cameras



Phase 2: Situational Awareness and Process

- **GOAL: Defensive processes, situational awareness**
  - *Internal security/Police cooperation*
  - *Find/prosecute pilot, shut off WiFi, close curtains*





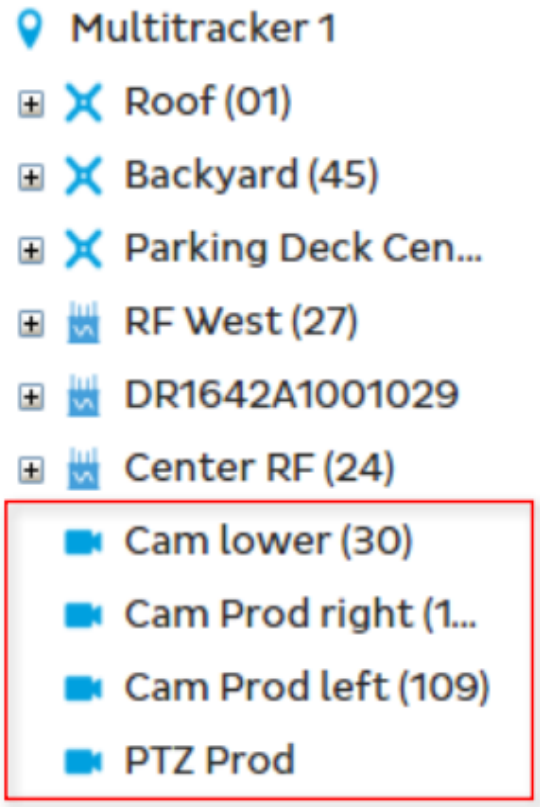
- **COMPONENTS: Video + other***
  - *Video evidence*
  - *Flight path of drone*



- **OUTCOME: Defend your asset**

Integration of IP Cams

- Integrate **external IP cameras** into the DroneTracker System
- Use any **HD and 4k IP camera** with the standard ONVIF Profile S



Enhanced Sensor Fusion

- Significantly **improved the localization** of drones
- Flight route is displayed on the map
- Route information such as flight direction and speed are also displayed.

Phase 3: Dissolve The Threat

- **Hacking/ Corporate Espionage:**
  - *Disable Wifi*
  - *Disable Bluetooth*
  - *Deploy BYOD Best Practices*
  - *Enforce VPN*
  - *Jamming (If permitted by US Government)*

- **Surveillance/ Corporate Espionage:**
  - *Schedule adjustments*
  - *Increased security private*
  - *Alert Authorities*
  - *Update Security Protocols*
  - *Flood Lights*
  - *Fog Bombs*
  - *Trigger Curtains*
  - *Jamming (If permitted by US Government)*

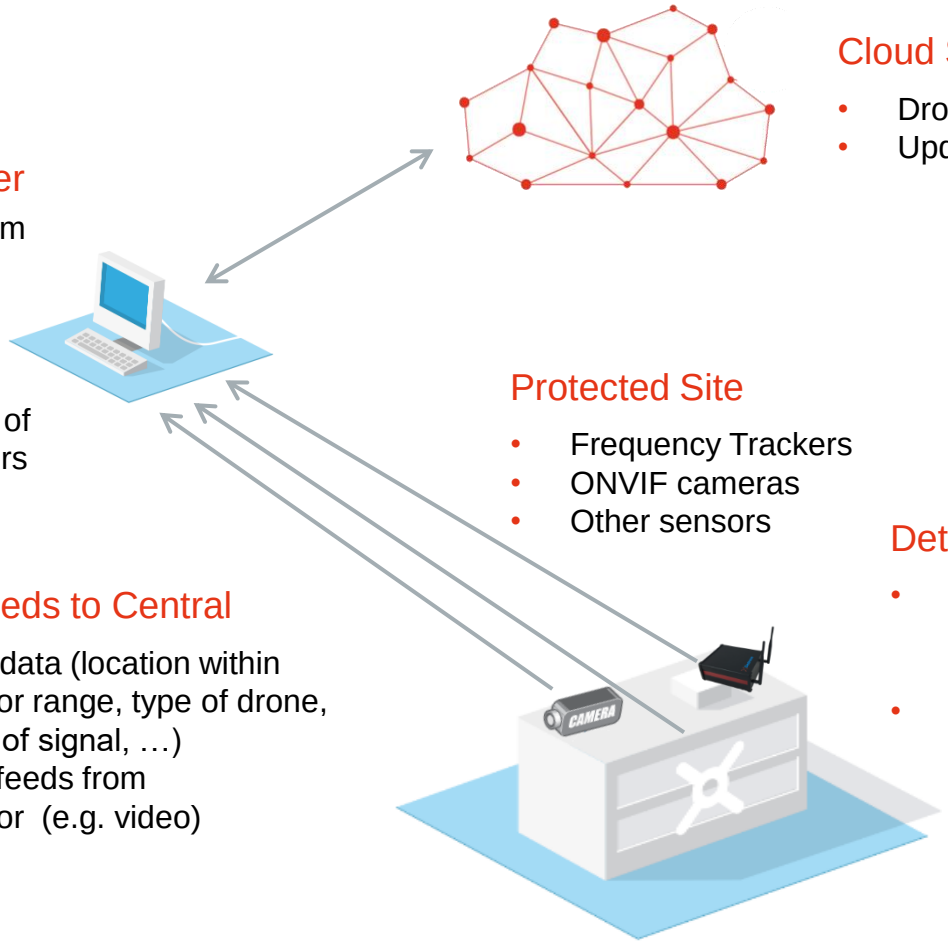
- **Ultimate Mitigation :**
  - *Legal Prosecution (finding pilot)*
    - *Via forensic Evidence*





DroneTracker Architecture

Detects drones automatically without the need for human intervention



Cloud Services

- DroneDNA (classification)
- Updates

DroneTracker Server

- Central security alarm control
- Triangulation, trajectory
- Interfaces/APIs
- Forensic recordings of live feed from sensors during alarm

Protected Site

- Frequency Trackers
- ONVIF cameras
- Other sensors

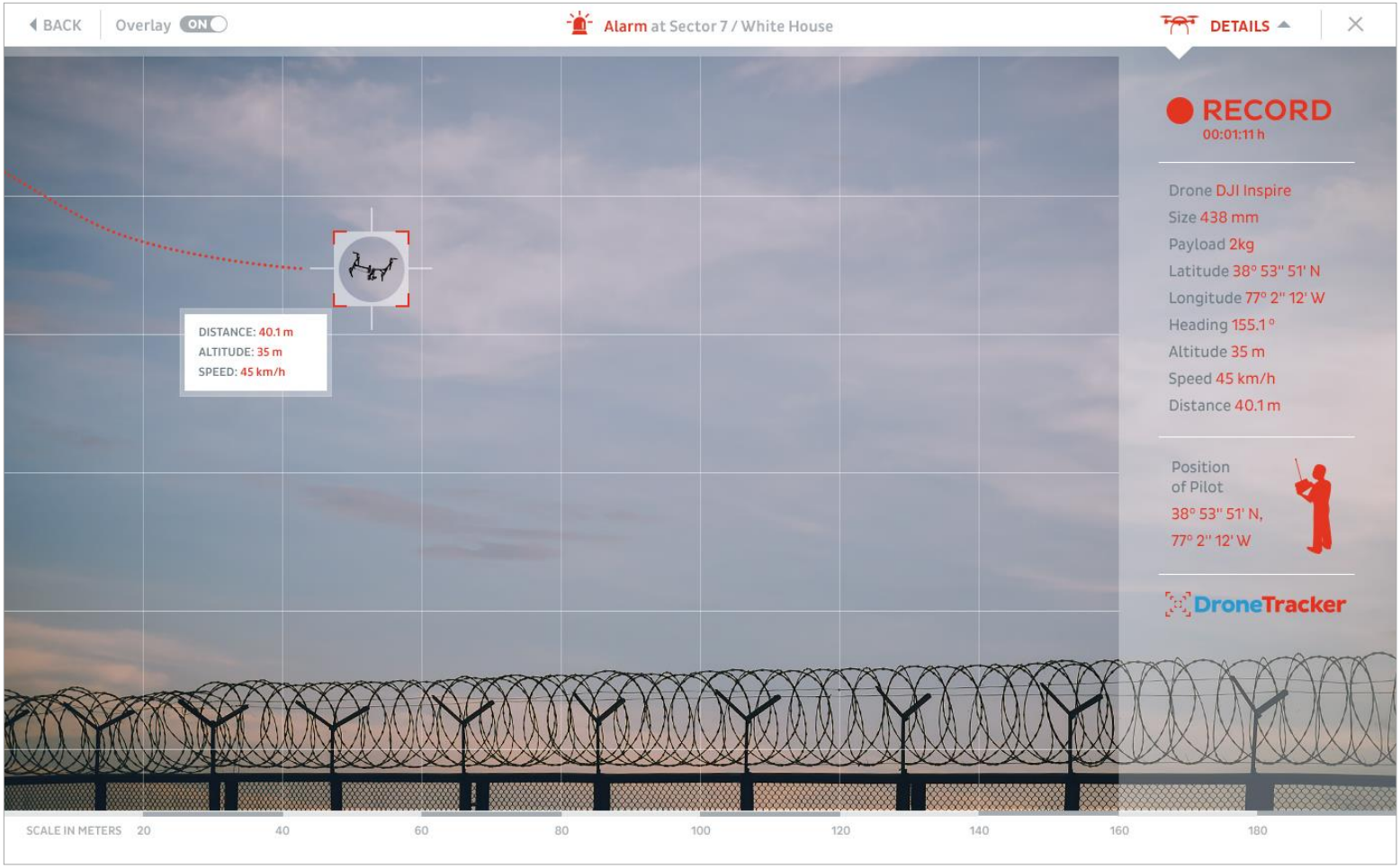
Detection and Analytics

- Machine learning based video, audio and RF detection
- DroneTracker or other sensor (camera, …) based

Data Feeds to Central

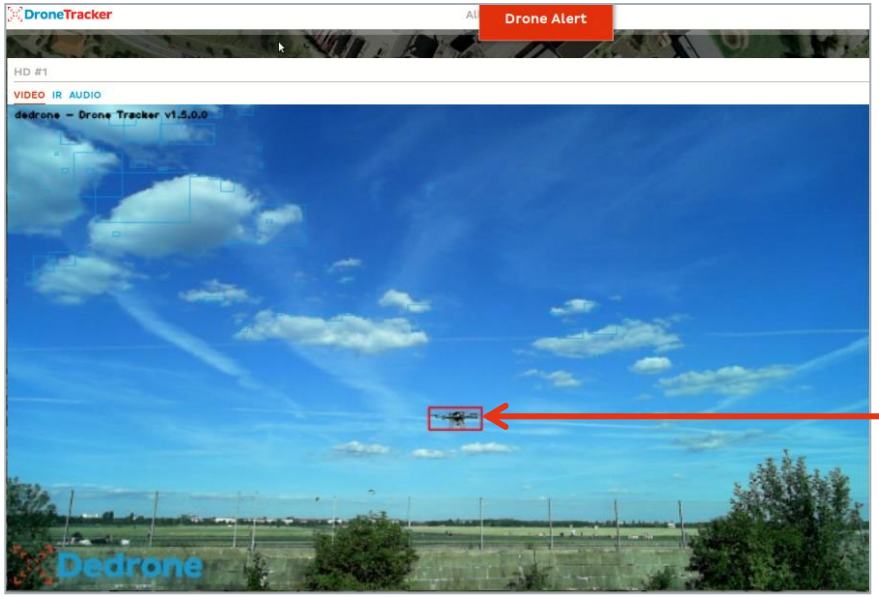
- Metadata (location within sensor range, type of drone, level of signal, …)
- Live feeds from sensor (e.g. video)

Fully Integrated Management System



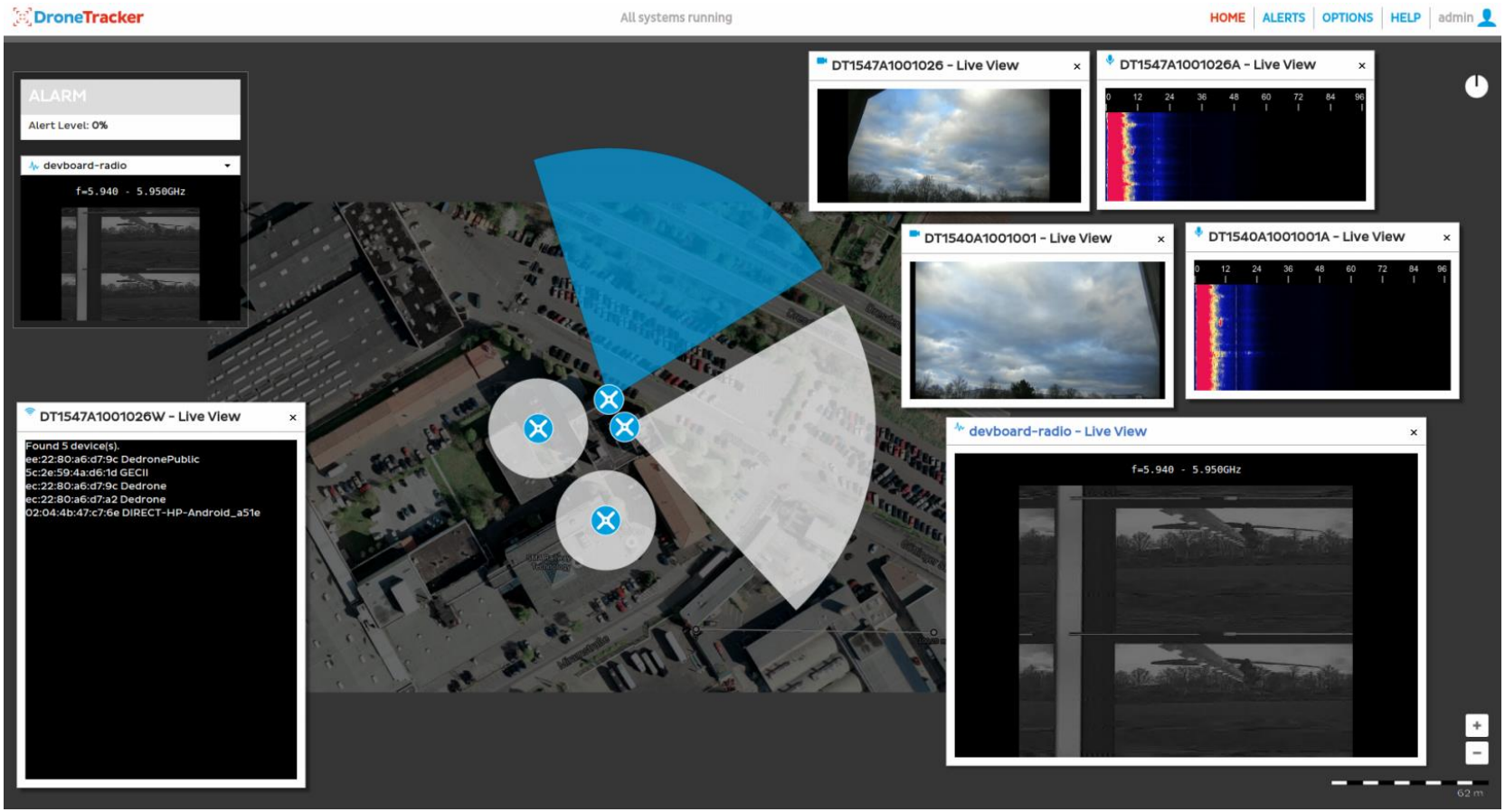
Tracking Drones Across a Property

- DroneTracker alerts based on multi-sensor analytics
- Alert can include position/distance of drone

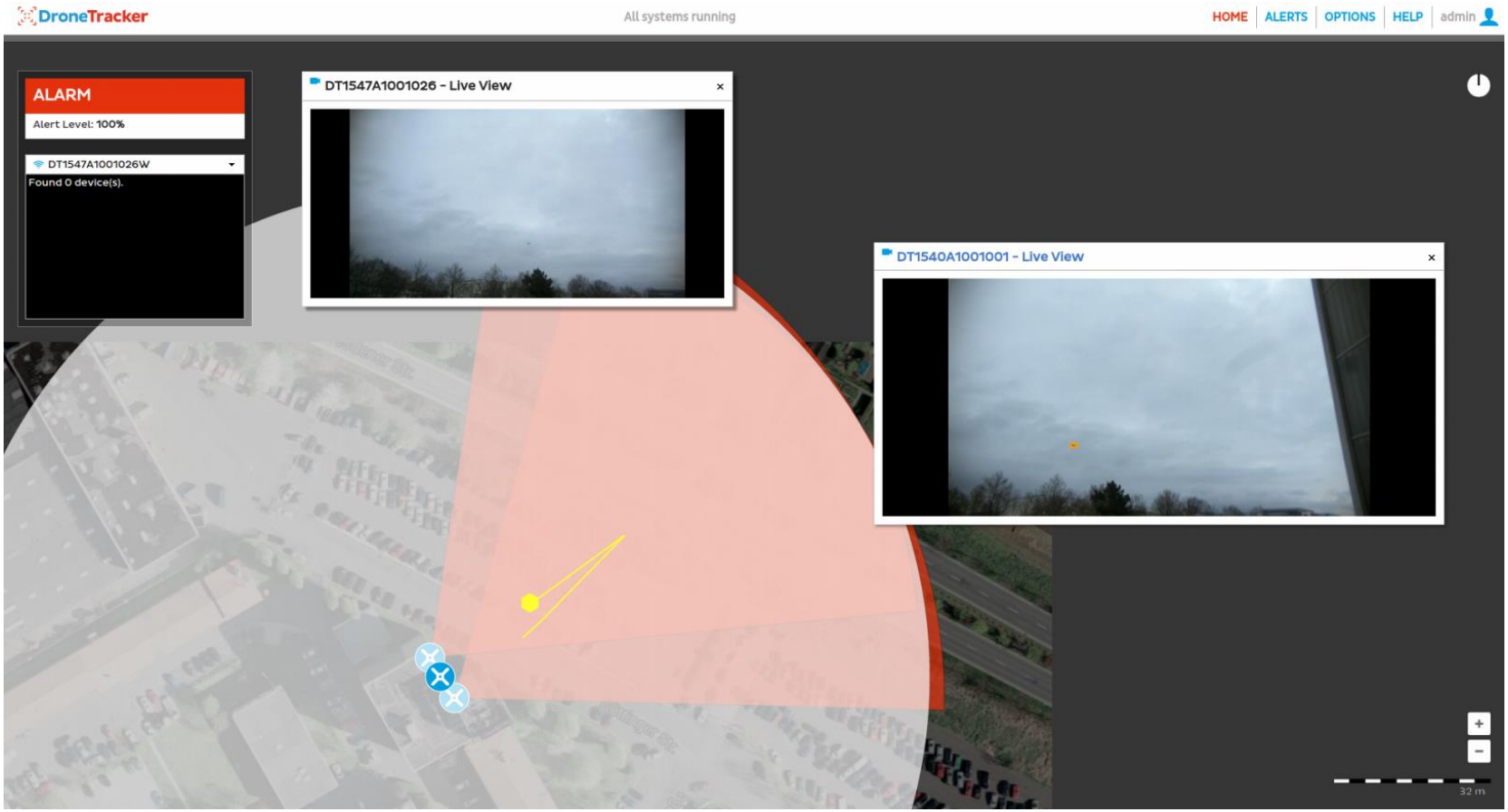


- Distance from camera can be inferred by calibration
- x/y can be inferred by detected ROI
- Signal alert and distance, location
- Needs calibration/site assessment – automation via GPS/compass/gyro

User Interface View



Trajectory Consolidation



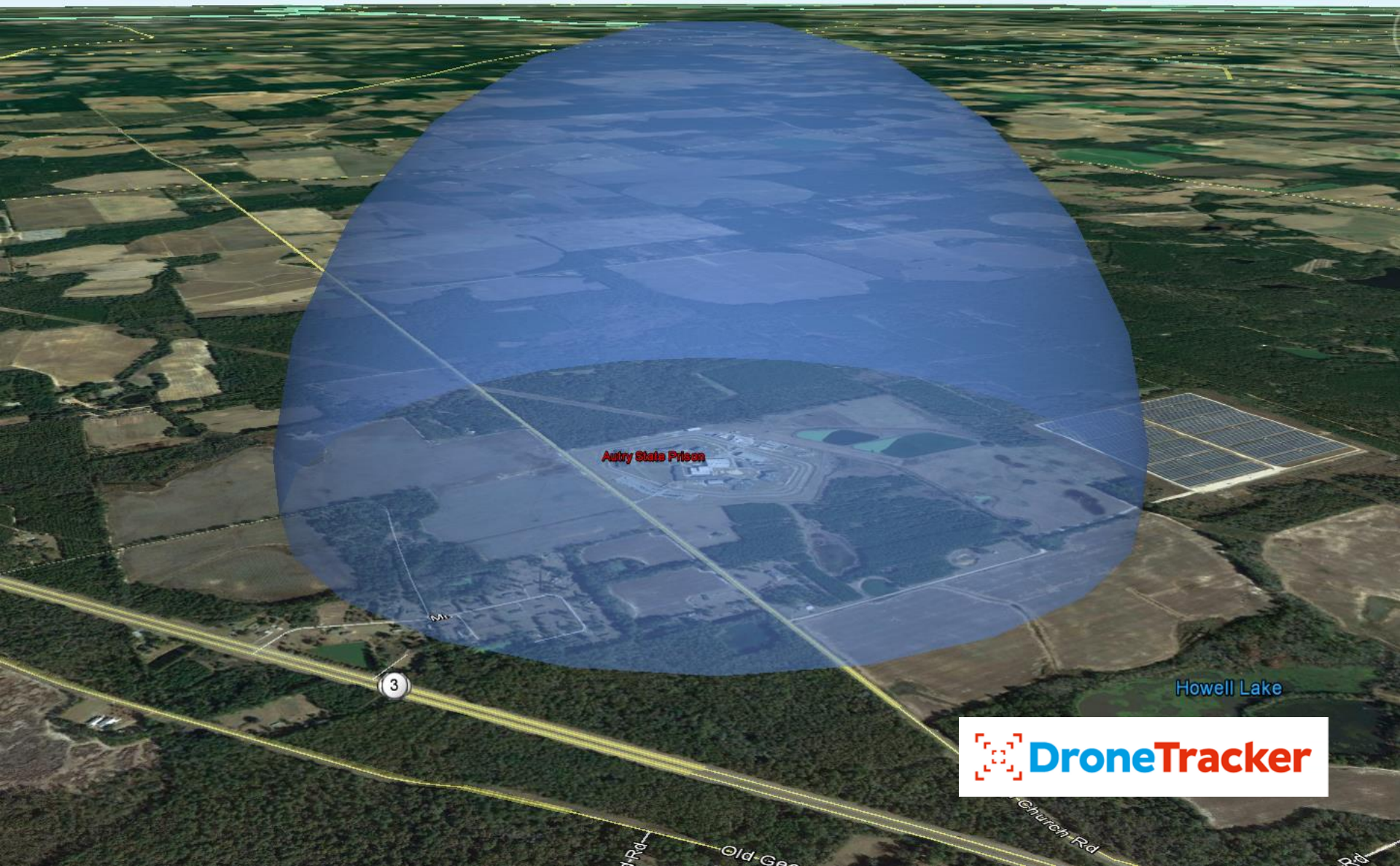
Integration into Existing Security Systems

- Easy configuration
- Easy integration in third party alarm systems, e.g. BIS
- High usability and efficiency for the staff
- No additional servers needed

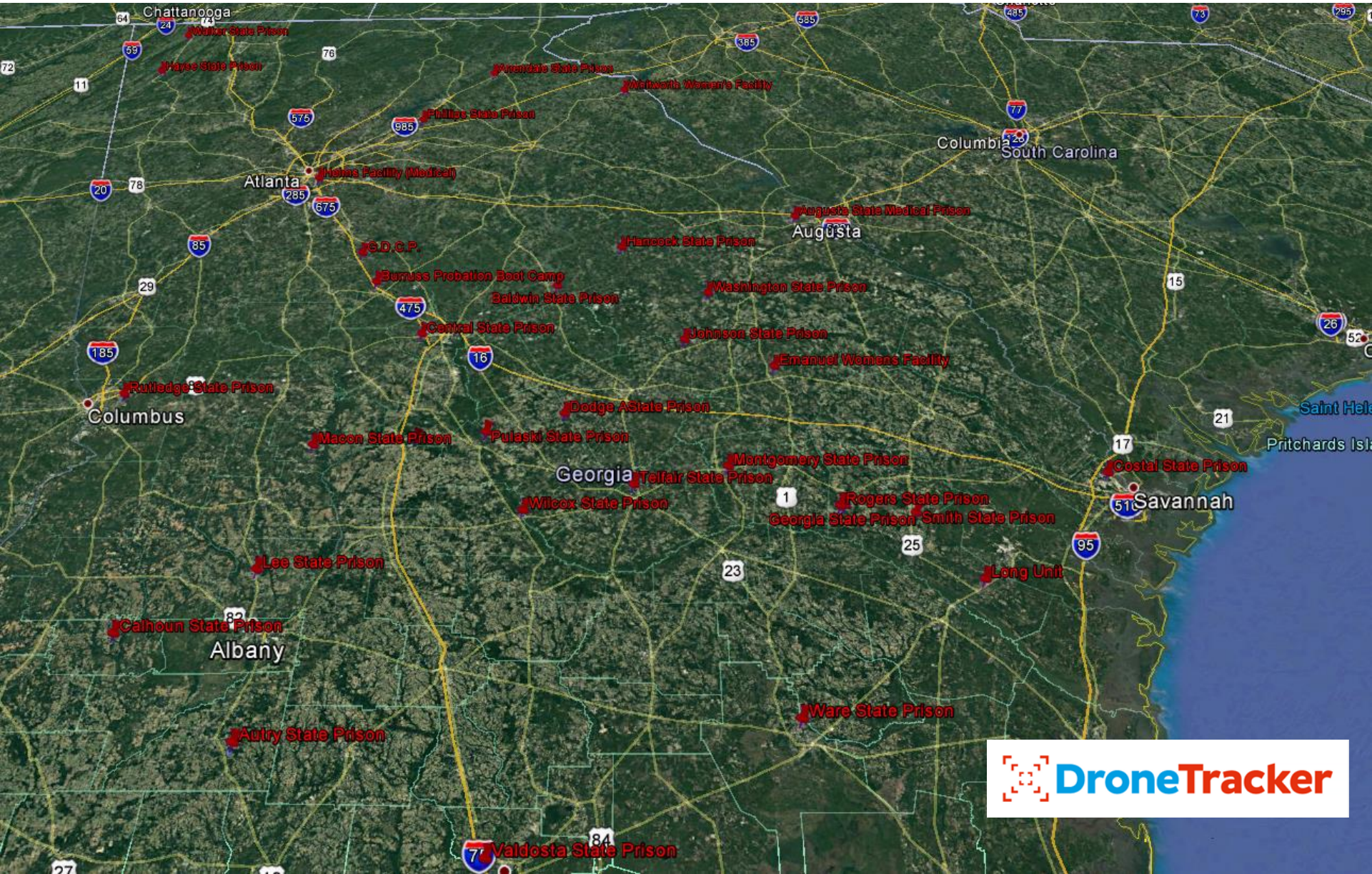


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Autry Detection Sphere



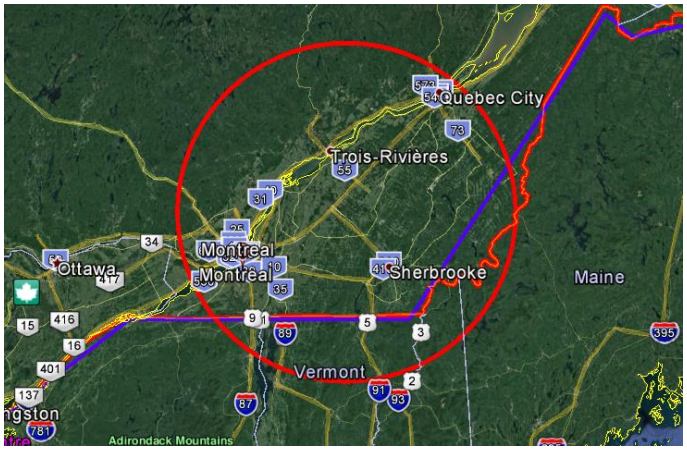
Georgia State Correctional Facilities



DroneTracker

Quebec prison smuggling goes high-tech with drones

Published Monday, February 6, 2017



Prison and jail guards in Quebec say they are concerned about a steadily-increasing number of drones making deliveries to inmates. The correction agents union said that in the past year, close to 90 drones were captured at facilities across the province -- 47 of them at Bordeaux Jail alone.

In 2015 guards only spotted 15 of the low-flying devices throughout Quebec.

Guards have seized cell phones, sim cards, tobacco, marijuana, and other drugs form the drones. “People used to throw tennis balls, now they're using drones to deliver the goods,” said Andre Durocher of the Montreal police.

Last year, police seized two drones close to jail before their deliveries were completed.

The SAPSCQ-CSN union believes that the drones that are caught are just a small fraction of the total number successfully making deliveries to inmates.

Residents say a field just west of Bordeaux Jail has become an airstrip for drones – some say they saw two to three people sending drones into the courtyard and bringing them back.

Guards are also asking officials to start implementing ways to block drones -- either by jamming radio frequencies, or installing nets and grilled rooftops to prevent anything from coming into jail yards.

Ex-con convicted in scheme to smuggle drugs into prison via drone

Drone service delivered drugs, porn and tobacco inside a maximum-security prison.
by **David Kravets** - Jan 16, 2016

A jury convicted a 25-year-old Tennessee man Friday for conspiring to smuggle—via a drone—illegal drugs, prescription drugs, pornography and tobacco into a Maryland maximum-security prison.

Thaddeus Shortz, 25, of Knoxville, was arrested in August outside the Western Correctional Institution in Maryland, where he was released in April. The authorities said they found a drone, and six packages of illicit contraband in his truck—worth about $35,000 in prison. An officer testified that the defendant, who faces decades in prison when sentenced later this month, admitted to using a drone to smuggle contraband into the prison about a half-dozen times before. A Maryland State police officer testified that the defendant got $4,000 a pop for each of his successful drops, and was "almost boastful about it." A co-defendant, who faces trial, was told in a telephone call by Shortz that the operation was a "gold mine," according to testimony.

Shortz had flown the remote-controlled drone, and its payload, over a 12-foot fence to inside the prison yard by a door in the back of a housing block for inmates learning to train dogs. Inmates walking dogs would retrieve the contraband. Inmates in the dog-training program are now supervised during their walks.



Items seized
in Maryland bust.

We represent approximately 50 commercial UAV platforms. Here are 2 of them…



ALTUS ORC4

Altus' VTOL Copter is a multi-purpose, single engine unmanned helicopter system that can be operated within or beyond visual line of sight. The unique design features of the ORC4 provide a superior payload capacity (up to 13lb), prolonged endurance up to 150 minutes, stable flight patterns and a high degree of safety features including Return-to-Home and Emergency Parachute deployment. Triple redundant Auto-Pilot, Infrared detection capable, can fly manually or via automated flight plan.



Lockheed Martin Indago

The Indago from Lockheed Martin may be the most versatile UAV for law enforcement organizations. The Indago has an impressive 50 minute flight time. Fully portable, this UAV folds neatly into a small carry case. "Plug and play" features allow for hot-swappable payloads for various missions. This turnkey solution is ready to fly and easy to operate. Used by multiple law enforcement groups, the Indago is the first choice in critical situations where the need for eyes-in-the-sky is timely.

Data Sheet DT RF Sensor

The DT RF Sensor is a passive, network-attached sensor for the detection of radio frequencies (RF) and Wi-Fi signals. It supplements the DroneTracker System with another level of detection. The DT RF Sensor detects and decodes targeted radio signals and sends the data, along with an alert, to the DroneTracker System.





Features

Range	up to 3300 ft (1000 m)
Device Type	sensor
Radio Frequency	omnidirectional passive sensing and decoding
L x W x H	9.8“ x 7.3“ x 7.4“ (250 mm x 185 mm x 188 mm)
Weight	6.8 lb (3.1 kg)
Ingress Protection Rating	IP54
Operating Temperature	-4 °F to +122 °F (-20 °C to +50 °C)
Power Supply	active PoE+ (IEEE802.3at)
Power Consumption	15 W (typ.)
Connectivity	via LAN in existing IT infrastructure
Software Configuration	via web interface DT Control Center
Operation	via web interface DT Control Center
Software Updates	firmware and DroneDNA updates via cloud-based database connection
Alarm Notifications	via DT Control Center

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Software License

The browser-based, user-friendly web interface DT Control Center allows you to easily configure the DroneTracker. You can also retrieve data such as videos or the history of previous drone alarms. Our intelligent pattern recognition software categorizes every detected drone on the basis of its individual characteristics such as size, movement and sound. These signatures – known as DroneDNA – are stored in a unique, cloud-based database, which is constantly and actively enlarged. All DroneTrackers worldwide receive regular updates.



Integration and Configuration

- Integration of multiple sensors
- Integration of third-party countermeasures via API
- Integration in existing alarm systems via API
- Easy configuration via user-friendly DT Control Center

Drone Detection with DroneDNA

- Comprehensive, permanently updated database with Wi-Fi, audio, video and RF signatures of drones

24/7 Real Time Surveillance

- Live view of each sensor
- Immediate alert notification via software, SMS, email, network message (TCP/ IP), SNMP,Pushover.net
- Automatic highlighting of triggering sensor in the case of alert

Automatic Conservation of Evidence

- List of all alerts with thumbnails of the most meaningful video images
- Playing back of all recorded alert data in the browser
- Download of all alert data in the corresponding format (MP4, JSON resp. WAV)

Software Updates

- DroneDNA updates via cloud
- Software updates via cloud
- Offline updates possible via manual server access

Dedrone Inc.
1099 Folsom St
San Francisco, CA 94103
USA

T: +1 415 813-6116
info@dedrone.com
www.dedrone.com

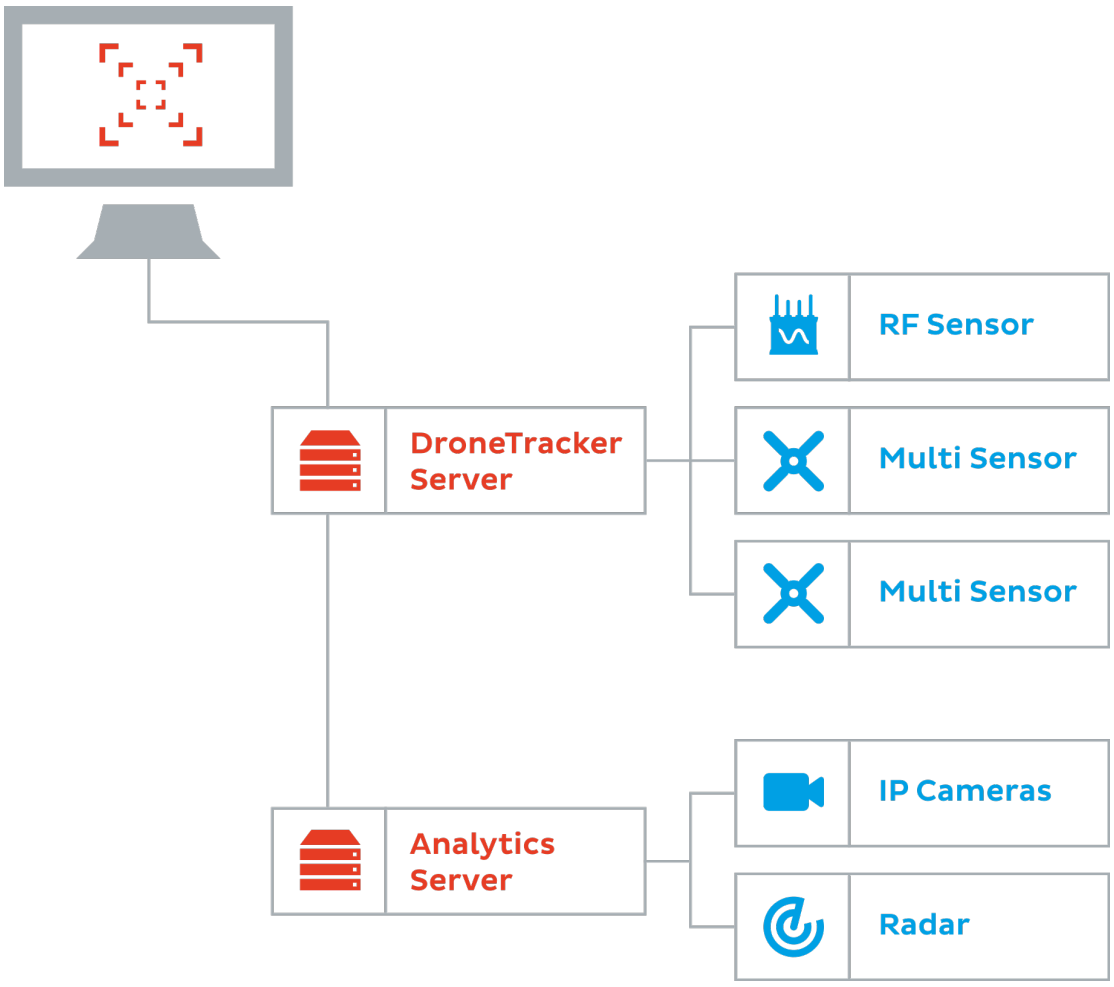
Software Subscription and Service

In order to guarantee that your DroneTracker is always running with the latest software and DroneDNA, a subscription to our software and service package is obligatory. The subscription also includes professional support for installation and configuration of the DroneTracker, as well as technical support.

Subscription and Support	Included
DroneDNA[1]	✓
Access to updates	✓
Email support	✓
Telephone support (callback)	✓
Technical support	✓
Support for installation and configuration	✓
Monthly updates via external data carrier for DroneTrackers without internet connection	✓

Planning Manual

Delpoying DroneTracker System 2.5



This document gives you a short overview of what the requirements for the system are and which steps have to be done to setup the system.

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Server Requirements

A DroneTracker System always needs a DroneTracker Server as a physical or virtual machine.

Depending on the kind of system, several server components are required.

A system **without** external IP cameras needs a DroneTracker Server as a physical or virtual machine.

For a system **with** external IP cameras one or more DroneTracker Analytics Servers are required. The amount of Analytic Servers depends on the number and type of cameras.

DroneTracker Analytics Servers have to be physical machines. The DroneTracker Server may also run on the same machine as the DroneTracker Analytics Servers.

DroneTracker Server

- ☐ Exclusive use of the server resources in this OS, physical or virtual machine
- ☐ 500 GB Hard Disc recommended, divided in System and Recordings:
  - **System**: 25 GB (required)
  - **Recordings**: depending on the number of sensors and system configuration; minimum 50 GB number of recordings severely limited, recommended 475 GB; additional storage for long term archiving
- ☐ Processor: Dual Core CPU (can be virtualized if exclusive)
- ☐ Working memory: 8 GB
- ☐ OS: Ubuntu 16.04 LTS – 64 bit

Analytics Server

- ☐ Maximum 6 x 4k-cameras or 16 x HD cameras per server.
- ☐ Physical machine, with exclusive use of the server resources in this OS
- ☐ Graphic Board: Nvidia GTX 1080 Cuda8
- ☐ Hard Disc: 500 GB SSD with good I/O, divided in System and Recordings:
  - **System**: 25 GB SSD (required)
  - **Recordings**: depending on the number of sensors and system configuration; minimum 50 GB number of recordings severely limited, recommended 475 GB; additional storage for long term archiving
- ☐ Processor: Intel Xeon E5 CPU with at least 12 Cores; 2,2Ghz and >25MB Cache
- ☐ Working memory: 64 GB
- ☐ OS: Ubuntu 16.04 LTS (Desktop) – 64 bit

Cable Requirements

Maximum Distance	100 m (328 ft) maximum distance from Ethernet device to next PoE Power Sourcing Equipment (PSE) / PoE switch, less than 70 m (230 ft) recommended For longer distances a PoE extender is required
Cable-Type	Cat-6 Cable recommended (For Cat-5e max 50 m (165 ft) distance recommended)
External Cable Diameter	3.5 mm – 7.5 mm
Connector	For a weather resistant connection to the Sensors it is necessary to crimp the supplied environmentally sealed Ethernet connector to the patch cable.

Steps to Set Up a DroneTracker System

1. Set Up the DroneTracker Server

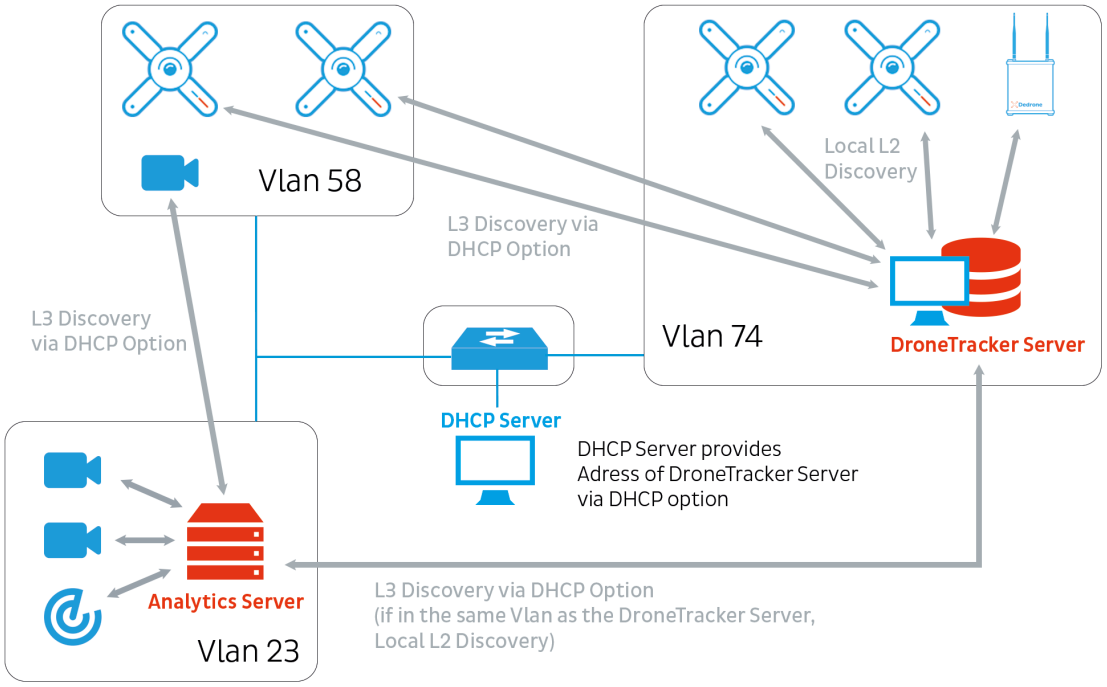
- Get IP for the desired environment.
- Configure the server (follow enclosed Readme).
- Log in to the user interface (DT Control Center).
- Change Login Password for the DT Control Center.
- Before a connection between sensor and server can be established, the sensor needs to be configured in the server. The "Add devices" list contains all sensors from which a discovery package was received (discovery mode) OR a connection request was made (DHCP option mode).

2. Configure Communication Between Server and Sensor

In a DroneTracker System several DroneTrackers connect to a central DroneTracker Server.

The DroneTracker Server and DroneTrackers can be on different Layer3/Routed Networks. In this Scenario, which will be common for most enterprise deployments, the DroneTrackers need to discover the address of the DroneTracker server. This discovery happens through a DHCP Option configured on the enterprise DHCP server much like the option provided for IP-Phones to find their call manager.

If the DroneTracker Server and the DroneTracker are on the same Layer2 Network (aka Vlan) there is a Layer2-discovery method available as well.

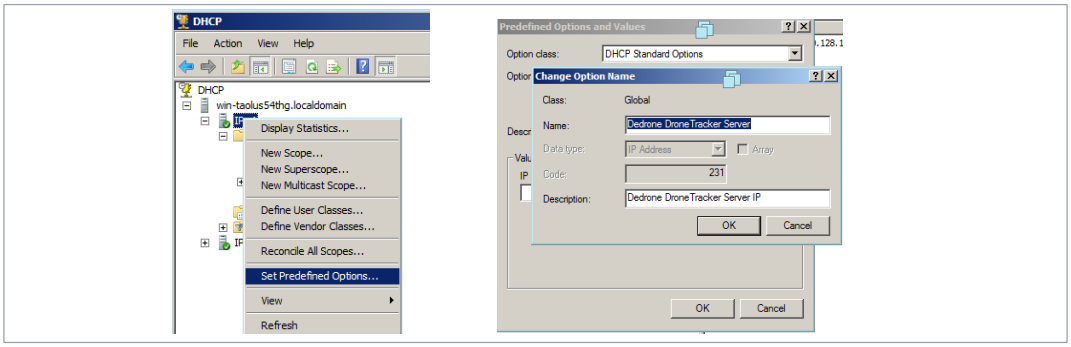


Network Communication in a DroneTracker System

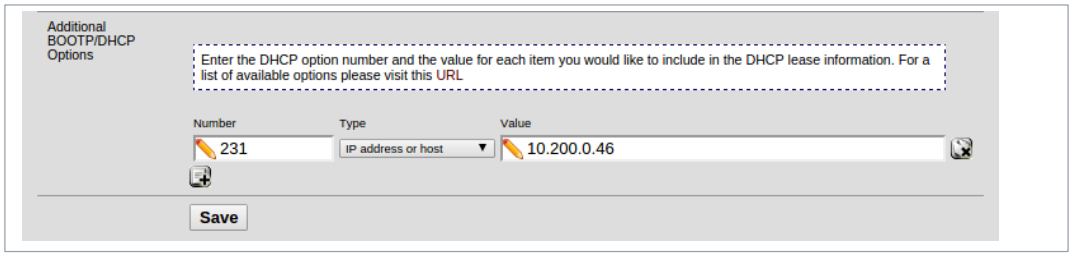
Forced Connection via DHCP Option

If the DroneTracker receives DHCP option 231 containing an IP address, the sensors will try to connect to a server instance on this IP address listening on port 8080. You can use DHCP option 232 as unsigned 16-bit integer to change the port.

If the connection to the specified server fails after 10 tries, the sensors will fall back to discovery mode for some seconds before they try to connect to the specified IP address again.



Windows 2008 DHCP Server



FreeBSD PfSense

After adding the DHCP option to your DHCP server, please make sure the DroneTracker renews or acquires a new DHCP lease. The safest way to ensure this is to reboot the DroneTracker.

UDP Broadcast Discovery

If DHCP option 231 is unset, the sensors will send UDP broadcast packets on port 9876 to their broadcast address as configured via DHCP. These packages publish a TCP port (default 8888, random if occupied) where the sensor is reachable for connection requests. The server will answer discovery packages for which it has a paired sensor on that port. The sensor then connects to the server that first answered the discovery package.

3. Install and Connect Sensors to the Network (see Installation Manual)

4. Add Sensors in the UI (Site Configuration and Map Editor)

Recommendations:

As RF sensors are based upon “line of sight,” installation should be made at a high point in the facility. Detection ranges are approximate, but estimated to 1 KM or 3280 feet. The sensor is IP54 rated for weatherproof use.

Installation requires PoE (802.3) cabling. Runs of longer than 100 feet may require a midspan PoE injector.

The state of Georgia should consider operating its own drone to regularly test the system.

Reference for the Dedrone Dronetracker:

Suffolk County Sheriff’s Office

C.O. Todd DeLong

Integrated Systems

Tel. (631) 852-7275

Mr. DeLong is very knowledgeable on the system. Questions should focus on software, detection and process, as their hardware configuration will be different than that proposed for Georgia, i.e. Suffolk uses fixed focal length cameras. These were demonstrated for GADOC, but are not part of this proposal.

Contact UAS: www.ua-sp.com

Mike Hickman

mhickman@ua-sp.com

Office: 423-713-5500

Mobile: 423-227-0471

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