



28 November 2016

ASX RELEASE – MARKET SENSITIVE

Tactical Drone Jammer - Product Launch

- Development of DroneShield[®] tactical drone jammer (DroneGun) product completed
- DroneGun now available for sale to approved customers
- DroneShield is the only company in the world offering both drone detection and handheld rifle-style tactical drone countermeasures
- Substantial need for the product, particularly given an increase in drone terrorism in the recent months

DroneShield Ltd (ASX:DRO) ("DroneShield" or the "Company") is pleased to announce the launch of a DroneGun drone countermeasure product, a breakthrough new product supplementing its existing drone detection product.

The product is a rifle-style handheld jammer device, highly effective at 2.4Ghz and 5.8Ghz frequencies (the standard frequencies of consumer and commercial drones globally). An optional GPS-jamming capability is also available to customers where lawful.¹



In addition to jamming the drone's pilot's communications with the drone, for many models of drones, DroneGun also triggers the "retun to home" function, which then assists DroneGun's user with tracking the pilot.

A short video of the jammer in action is available under: www.droneshield.com/videos

¹ DroneGun has not been authorized as required by the United States Federal Communications Commission ("FCC"). This device is not, and may not be, offered for sale or lease, or sold or leased, in the United States, other than to the United States government and its agencies, until such authorization is obtained. The use of DroneGun in the United States by other persons or entities, including state or local government agencies, is prohibited by federal law. Laws limiting the availability of DroneGun to certain types of users may apply in other jurisdictions, and any sales will be conducted only in compliance with the applicable laws.



The Company has completed the development and commenced commercial production of DroneGun, and is marketing it globally to customers who are legally able to purchase it. The product is being marketed through the Company's existing network of distributors in 35 countries, particularly from military and law enforcement, who have previously expressed significant interest in tactical jamming countermeasures. Many of the potential customers are located in countries with a more liberal regulatory framework for jamming devices than the United States. The addition of the "final piece" of the drone security network is synergetic to the Company's drone detection product (as detection is needed before countermeasures can be applied; and conversely detection often requires countermeasures).

Peter James, Chairman of the Company, has commented "The completion of development of DroneShield's tactical drone jammer, and its addition to DroneShield's product offering, is consistent with our strategy of being a leader in the integrated drone security market. The DroneGun product is highly complementary to our existing drone detection products. The product is sorely needed by a wide range of customers from government and military agencies to civil infrastructure to VIP protection. It is simple to operate and requires no technical training. This is a unique product with very few competitors globally."

With the addition of DroneGun, the Company has become the only global provider of a comprehensive drone security system that includes both world-leading acoustics-based detection and highly effective and easy to use handheld rifle jammer countermeasures.

The Company continues to develop internal and assess external detection and countermeasure methods for incorporation in its offering.

Drone-related threats are rapidly accelerating and becoming common-place globally, particularly in terrorism deployments. In the recent two months alone, incidents have included:

- an ISIS drone rigged with explosives killing 2 Peshmega fighters and wounding 2 French soldiers²,
- ISIS drones releasing hand grenades against US-backed forces³, and
- use of drones by ISIS for battlefield surveillance⁴.

Further, the White House believes that a domestic terrorism act using a drone in the US is a matter of time⁵, with similar threats elsewhere globally.

DroneShield's Board member and shareholder Dr Samantha Ravich (former senior White House official and a Deputy National Security Advisor for Vice President Cheney) commented: "DroneGun's addition will enable DroneShield to help approved customers protect safety, security and privacy from drone threats globally, across battlefield situations, secure or public facilities, organised events and VIPs".

Annexed to this announcement is the Company's product brochure setting out the technical specifications, benefits and uses of the DroneShield product offering. For further information on the product, please refer to the Company's website or the contact information below.

 $^{{}^2\} https://www.theguardian.com/world/2016/oct/12/exploding-drone-sent-by-is is-allies-kills-and-wounds-troops-in-iraq-report$

³ http://www.vocativ.com/376095/isis-grenade-launching-drones/

⁴ http://www.nytimes.com/2016/10/12/world/middleeast/iraq-drones-isis.html

⁵ http://www.military.com/daily-news/2016/10/12/white-house-workshop-predicts-deadly-drone-attacks-us.html





Further Information

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About DroneShield Limited

Based in Sydney and Virginia, DroneShield is a worldwide leader in drone security technology. The Company has developed the pre-eminent drone security solution that protects people, organisations and critical infrastructure from intrusion from drones. Its leadership brings world-class expertise in engineering and physics, combined with deep experience in defence, intelligence, and aerospace.

ENDS





Product Information



A New World

With 12 million drones expected to be operating by 2020, it's no surprise the number of drone incidents are growing by the day –intentional and unintentional.

Recreational and commercial drones generally range in cost between US\$30 and US\$30,000, are legally available at conventional retailers and online, and can be lawfully flown in most major countries.

Their remote based operation with GPS navigation, compact size, vertical mobility and exceptional agility affords them with a host of positive far-reaching applications from emergency response, surveying, photography, filmography, through to logistics. What was once virtually impossible to scale or otherwise difficult to commercialise due to high costs is now possible.

Almost as easy as they are to acquire, is their ability to directly or indirectly cause damage, death or loss; and with so many new drones entering the skies every day it's no surprise the volume of drone incidents are continuing to climb.

Privacy & Safety

Advancing your organisation's ground-based security capabilities into the skies has now become an essential part of an effective security strategy built for today's environment and into the future.

As consumer-grade drones have become extremely popular around the world, they're presenting both unique and frequent threats to privacy, physical security and public safety in a wide variety of environments, including industrial and critical infrastructure, prisons, government facilities, airports, outdoor events and venues, military, homeland security, border control, real assets and executive protection.

What was once protected by high elevations, guard towers, physical barriers or other ground-based preventative measures has now become exposed and penetrable. As such, drone security should be on top of any organisation's agenda that has a duty to protect the privacy and safety of those in which it is entrusted to do so.

How safe are your skies?



The DroneShield® Solution

DroneShield® helps your security forces identify unauthorised drones at short & long range using proprietary technology, real-time alerts and digital evidence collection.

Powered by our proprietary acoustic detection technology, an enterprise-grade sensor network and real-time alert system— DroneShield® is the premier solution to passively sense drones that are invisible to radar, evade line of sight or that lack radio-frequency links ensuring your security capabilities are equipped to deal with this new & growing threat.

Listening: DroneShield® sensors recognise unique sound properties of common drone types. They listen to surrounding activity, establishing and taking a sound sample when they sense drone activity nearby.

Analysis: DroneShield® compares the sample to our database of acoustic signatures. If it finds a match, the system issues an alert and records identifying information about the aircraft.

Identification: Our extensive audio signature database makes it possible for DroneShield® to distinguish a drone from everyday sources of noise. This allows us to detect drones with high accuracy, delivering low false-alarm rates.

Alerts: Instant alerts are delivered independently through a variety of methods, including SMS, email, or existing video or incident management systems. DroneShield® easily integrates into your established security system.

Our detection products also include a cloud-based visual interface, giving you live visibility to surrounding acoustic activity making it easy for you to respond swiftly and precisely.

Subscription Model

When you choose DroneShield® you get the convenience of receiving all software Θ hardware for the lifetime of your installation.

Our subscription based pricing model provides you with immediate and ongoing benefits which include:

Zero CapEx required with none of the upfront and ongoing hardware costs that are often associated with security systems.

All software updates to our proprietary audio signature database

All software updates to the DroneShield® User Interface

Ongoing access to after sales support from DroneShield®



Far Reaching: Detect up to 1km

Convenient: Remotely configurable using the DroneShield®

User Interface

Durable: Weather resistant

Accurate: Able to distinguish drone activity from common

environmental noise sources at superior distances

Ideal for:

Prisons
Airports
Government Assets
Defence and Military
Critical Infrastructure
Security Interests

Law Enforcement
Data Centers
VIP & Executive Residences
Sports and Concert Stadiums
Film Productions
Special Events

DroneShield® Long Range Sensors ensure your drone surveillance capabilities are maximised with an extended-area drone detection reach of up to a 1km radius. Sensors can be configured remotely using the DroneShield® User Interface.

It's the ideal first-line detection solution, affording your security force with time to react.







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International +61 (2) 9995 7280

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Specifications

Performance

Rural environment, medium drone: 500-1000m Suburban environment, small drone: 250-500m Urban environment, small drone: 100-250m Warning times are dependent on distance to perimeter

Output Options

IP-based alerts (email, SMS, XML/JSON) indicating zone, drone type, and digital evidence Mobile (SMS, audible phone call) Radio frequency audible alerts

Power and Communications

12-48VDC, PoE, or 120v/240vAC power Wi-Fi, wired Ethernet, GSM/GPRS, dry contact relays, XML/JSON

Environment and Installation

Designed to IP65 of IEC529

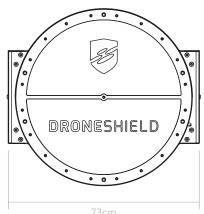
Mounts to standard cell tower base station antenna mounts

Maintenance

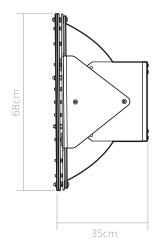
Routine inspection and regular remote database updates

Warranty

12 months from date of shipment



FRONT VIEW



SIDE VIEW

Dimensions

Parabolic microphone: 66cm diameter x 26cm Weight: 15kg



Broad Coverage: 180 degree range of detection **Inconspicuous:** Simple downsized design allows for

discreet installation

Designed For Outdoor Accuracy: Weather resistant and

filters common environmental noise

Convenient: Remotely configurable using the DroneShield®

User Interface

Ideal for:

Prisons
Airports
Government Assets
Defence and Military
Critical Infrastructure
Security Interests

Law Enforcement
Data Centers
VIP & Executive Residences
Sports and Concert Stadiums
Film Productions
Special Events





DroneShield® Omnidirectional Sensors provide 180 degree coverage of local acoustic activity at close range. Small and compact in size makes it the perfect solution for inconspicuous installation. An all-weather design withstands extreme outdoor conditions, allowing it to distinguish common environmental noise sources from drone activity. Sensors can be configured remotely using the DroneShield® User Interface.

Perfect for suburban and urban environments.



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Specifications

Performance

Omnidirectional microphone: suburban environment: up to 200m Warning times are dependent on distance to perimeter

Output Options

IP-based alerts (email, SMS, XML/JSON) indicating zone, drone type, and digital evidence Mobile (SMS, audible phone call) Radio frequency audible alerts

Power and Communications

12-48VDC, PoE, or 120v/240vAC power Wi-Fi, wired Ethernet, GSM/GPRS, dry contact relays, XML/JSON

Environment and Installation

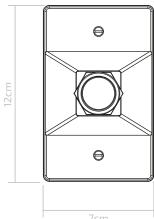
Designed to IP65 of IEC529 and NEMA 1, 2, 4, 4x, 12, and 13 specifications
Mounts to wall or panel with #10 size screws
Electric Magnetic Compatibility: Complies with
BS EN50081-1 and EN50082-1

Maintenance

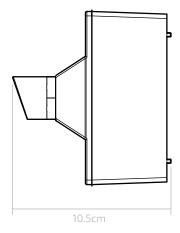
Routine inspection and regular remote database updates

Warranty

12 months from date of shipment



FRONT VIEW



SIDE VIEW

Dimensions

Sensor body: 22cm x 15cm x 6cm Weight: 3.6kg



Application

Safe countermeasure against a wide range of drone models Controlled management of drone payload such as explosives No damage to common drones models or surrounding environment due to:

> vertical controlled landing on the spot, or return back to the starting point (assisting to track the operator)

Drone remains intact and available for forensic investigation Immediate cease of the video transmission back to drone operator Rifle shape with a backpack Packed in a hard pelican case One person operation



Disclaimer:

DroneGun has not been authorized as required by the federal communications commission ("FCC"). This device is not, and may not be, offered for sale or lease, or sold or leased, in the United States, other than to the United States government and its agencies, until such authorization is obtained. The use of DroneGun in the United States by other persons or entities, including state or local government agencies, is prohibited by federal law. Laws limiting the availability of DroneGun to certain types of users may apply in other jurisdictions, and any sales will be conducted only in compliance with the applicable laws.



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.



Specifications

Jammer Specifications

Voltage: 16.8+/-0.1V

Runtime: 2hr

Charging time: 90min Max distance: Up to 2km Jammer frequencies: 2.38Ghz-2.483Ghz 5.725Ghz-5.825Ghz GPS (optional) GLONASS (optional)

Battery Specifications

Lithium-lon V-Mount Batteries 14.8V, 90wh 0.9kg

Antenna Spefiications

Mount: Picatinny Rails / MIL-STD 1913 Rails

Type: directional antenna V-Plane: 10 degrees

Environment

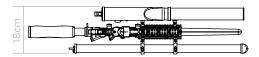
Operating temperature: -10°C to +60°C No calibration required, "plug and play" No reload time

Warranty

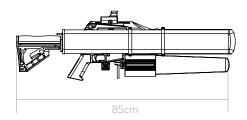
12 months from date of shipment

Maintenance

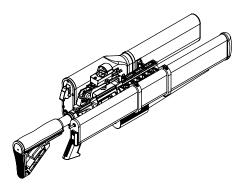
No specific maintenance required



TOP VIEW



SIDE VIEW

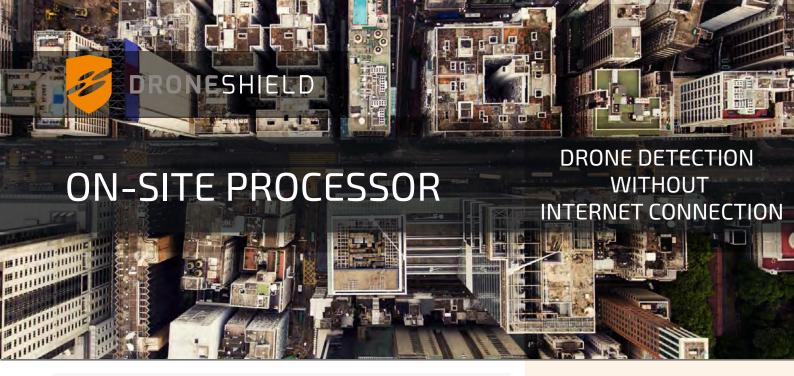


PICTORIAL VIEW

Dimensions

Sensor body: 85cm x 18cm x 27cm

Body Weight: 5.7kg



Versatile: Does not require internet connection (note: optional internet connection may be activated by the user for technical support and periodic drone database updates). Ideal for situations where internet connection is not possible or desired

Accurate: Same precise identification of known acoustic

signatures as our cloud based products

Real Time: Instantly notifies you of drone activity



The DroneShield® On-Site Processor collects audio data from DroneShield® sensors and compares it to known acoustic signatures in our proprietary software database, without requiring an Internet connection. When it finds a match, the Processor issues instant alerts via SMS, email, or alarm systems through JSON, XML, or dry contact relays. Designed for use with both Omnidirectional and Long Range Sensors, this product is able to support up to 20 sensors.

Perfect for facilities requiring an 'air-gapped' solution.



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Scalable: Platform is built on a back-end infrastructure

that scales to any size

Immediate: Reports live, ongoing activity

Flexible: Can be used for low-cost, bi-sensor residential

protection or enterprise-level installations

Convenient: Can be accessed and configured remotely

from any web browser, wherever there is

Internet connectivity

Compatible: Easily integrates into existing

security systems

User Interface is included with purchase of any DroneShield® detection system.



DroneShield® User Interface



DroneShield® SMS Alerts

The DroneShield® User Interface displays alert information and other critical sound and system data. A visual and audio interface delivers live readings from DroneShield® sensors, providing real-time visibility to surrounding acoustic activity. Remote access to your DroneShield® sensors allows you to check statuses, listen to sensor audio, respond to real-time alerts, and configure your system settings.

The convenient browser-based monitoring application lets you view and control your DroneShield® detection activity from anywhere.



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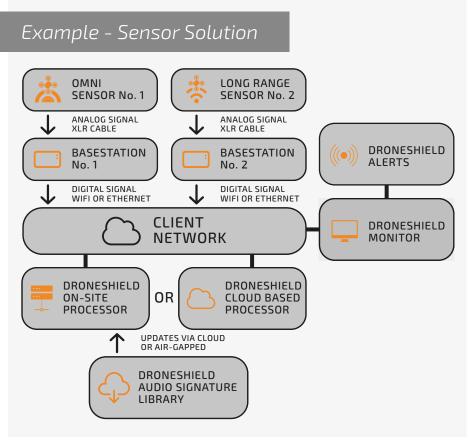


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DroneShield® can supply a tailored solution for any site requring protection from aerial drone threats.



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FAQ's

Drone Detection

How far away can the sensor detect a drone?

Detection range depends on a number of factors such as the type of drone, background environment, and how the detection thresholds have been set. The DroneShield® low-profile omnidirectional sensors can detect up to 200 meters. DroneShield® Long Range parabolic dish sensors can detect up to 1 km.

Does the system only work within line of sight?

No, DroneShield® uses acoustics that work without requiring direct line of sight.

For urban areas with vehicle & other sounds, will the sensors pick-up a drone?

Yes, DroneShield® can filter background noises with our sensors. For high noise environments it is recommended to locate the sensors more closely together (100m for Omnidirectional Sensors, for example).

How does weather effect your system?

Weather (wind, rain) can impact the performance of DroneShield®, but weather strong enough to significantly impact performance will also be strong enough to prevent most drones from flying.

What is the advantage of DroneShield® vs other systems?

Laser and LIDAR

The active defeat capability of laser is very expensive

Legal issues (generally unlawful to shoot down and take control of the drone in the US and many other countries, even above private property).

In any event, to defeat, one needs first to detect (hence the need for DroneShield®)

Limited range, especially in bad weather

Potential for false alarms and inaccuracies

Radar

Expensive

Line of sight required

High false alarm rate renders impractical for small drones

Does not detect many small drones

In the US, an active system needs Federal Communication Commission (FCC) approval and must not interfere with other radio frequency systems (e.g. radio)

Optical and Infrared Cameras

Line of sight required

Potential to be blocked by trees, bushes or buildings

Potential for false alarms and inaccuracies

Very short range

Expensive

Radio Frequency (RF)

Legal issues (unlawful to interfere with drones in the US and number of other countries)

Typically challenging against certain types of drones (e.g. frequency hopers, such as LightBridge)

Ineffective on certain types of drones (e.g. those on autopilot)

Potential for false alarms and inaccuracies

Expensive.

With new drones coming on the market, will your system detect them?

DroneShield® updates its drone database on a regular basis. While there are a large number of drones in the market, they often have similar acoustic signatures and thus can be detected so long as the "family signature" is in the database.





FAQ's

Can your system detect do-it-yourself (DIY) or custom drones?

Most DIY and custom drones use commercially available components, especially the parts that make the acoustic sounds we search for (motors, propellers, etc). Thus, even though the drone itself is considered custom or DIY, the acoustic emissions will be similar to commercially-available drones and be detectable by the DroneShield® system.

What is the likelihood of false alarms due to commercial planes, birds or other airborne objects? As DroneShield® uses acoustics (not radar), airborne objects are not usually an issue.

Are there any active emissions from your system, for example IR or optical laser, high intensity thermal or radio frequency?

There are no active emissions at all, the DroneShield® system is completely passive.

How do I receive alerts?

Integrating with existing security systems is the best way to receive alerts; this can be accomplished either through dry contact relays or XML/JSON protocols for IP-based systems. Other alert paths include SMS and email when the DroneShield® system is connected to the internet.

Once detected, how often are alerts sent?

This is a user-configured parameter where alerts are sent periodically as long as the drone is detected.

Drone Neutralisation

Can DroneShield® disable the drone that is approaching?

DroneShield®'s sensors act as an alert system. The user is able to integrate the system with protocols as appropriate to their situation.

What options do I have to stop the approaching drone?

Available countermeasures depend on the end-user's situation and laws in their jurisdiction. Interfering with a drone in a civilian environment is not currently legal in a number of countries, as they are considered private property. Where legally available, the customer can deploy the DroneShield® DroneGun Tactical Drone Jammer as an effective countermeasure solution.

Installation

I would like to install your system, what are next steps?

Please contact DroneShield® directly so we can attend to any of your questions. Once we understand your initial requirements DroneShield® can develop an estimate based on the location points of the sensors on your site. This may use Google Maps and/or any other maps you provide. The cost of this estimate would depend on the scale and complexity of your site. Following the estimate, the next step is installation of the sensors by a local installation provider of your choosing, who can be supported by the DroneShield® technical team as required.

Are there export/ITAR restrictions with your system?

There are no ITAR restrictions on the DroneShield® acoustic sensor system. No specific export restrictions apply.

What information is required to be able to establish a proposed architecture and price a system?

For an exact quote, we will need property plans and dimensions of buildings, perimeters, and existing infrastructure. Google Maps is generally sufficient for an approximate quote. The installer will need cable installation information such as existing cable runs, location of server room, security room, existing power spots, etc.





FAQ's

What are your products?

Omnidirectional Sensor pack: omnidirectional microphone, base station (with connectivity to internet through WiFi or an Ethernet cable), and connected power supply.

Long Range Sensor pack: parabolic dish with microphone, base station (with connectivity to internet through WiFi or an Ethernet cable), and connected power supply.

Demonstration kit: two Long Range Sensors and one Omnidirectional Sensor.

Portable kit: Omnidirectional Sensor plus battery and tripod, enclosed in Pelican case.

DroneGun Tactical Drone Jammer: Jammer and backpack enclosed in hard storage case.

On-Site Processor: Stand-alone processor and connected power supply.

What kind of power is required for a sensor?

The requirement entering the base station is 12VDC. We have adapters that can convert wall power (120VAC - 230VAC), and any other DC source (12-48VDC).

How do your sensors connect to the cloud/server?

The base station sends the microphone's data to the processor; it connects to the processing server using Ethernet (Cat5e or WiFi).

How fast does my internet connection need to be?

Each sensor requires 0.4Mbps upload speed. Future releases target to reduce this requirement.

How close to the base station does the microphone need to be?

The microphone connects to the base station via 22AWG shielded three-conductor cable; the microphone should be installed no further than 300 meters from the base station.

What is the weight of the sensors?

The Omnidirectional Sensor with base station, without mounting hardware, weighs approximately 5lbs (2.27 kg). The long range parabolic dish sensor with base station weighs approximately 35lbs (15 kg).

What is the coverage of the sensors?

Omnidirectional Sensors cover 180 degrees from the front of the sensor, in all directions including altitude. The Long Range Sensor covers a 30 degree cone. The sensors can be placed "back-to-back" to provide a 360 degree coverage (2 Omnidirectional Sensors or 12 Long Range Sensors).

Are there any constraints with regards to installation location? (e.g. nearby RF radiating equipment.)

We seek to install our sensors away from noise-generating equipment such as HVAC, power generators, or other equipment that may emit strong RF signals.

Can the DroneShield®'s technology be integrated with another existing system?

DroneShield® will consider permitting incorporating its technology within a broader security system on a case-by-case basis.





For Further Information

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DroneShield® has approximately 50 distributors in over 30 countries.