

 **ZEN**  
being there...

**ADS**

ANTI DRONE SYSTEM



 **ZEN TECHNOLOGIES LIMITED**

**RFDD**

RF BASED DRONE  
DETECTOR

**VDIT**

VIDEO BASED DRONE  
IDENTIFICATION & TRACKING

**DFCC**

DATA FUSION &  
COMMAND CENTRE

**DRFJ**

DRONE RF JAMMER

MODULE OF MULTI SENSOR SETUP INCLUDE:

RF Detector Antenna  
System

Direction Jamming Antenna

Omni Jamming Antenna

Video based Drone  
Identification & Tracking

### ZEN ANTI-DRONE SYSTEM

is a Multi-Layer Multi Sensor Architecture  
aimed at providing comprehensive security  
against drone attacks.



### RF Based Drone Detector (RFDD):

RFDD detects the drone using Radio Frequency (RF) communication between drone and Ground Control Centre (GCC). This System is on continuous search mode on wide band of frequencies that typically used by Drone and its GCC. Whenever a frequency of

interest is identified, the system locks and monitors the signal. Based on the identified signal, system estimates the direction of Drone and its GCC. An array of receive antenna is used for estimation of direction of signal.



FREQUENCY COVERED



**-110 dBm at 0 dB SNR**  
DETECTION SENSITIVITY

#### MODEL RFDD01

433.92 MHz (1.74 MHz)  
915 MHz (26 MHz)  
2.45 GHz (100 MHz)  
5.8 GHz (150 MHz)



**10 m - 10 Km**

DETECTION RANGE

#### MODEL RFDD02

400MHz to 6GHz

#### MODEL RFDD03

20MHz to 6GHz



**AZIMUTH 0° - 360°**  
**ELEVATION 0° - +70°**

ANGULAR COVERAGE

Capability to detect hopping signals upto **2000 hops/s**

Detection of swarm of drones upto **100**

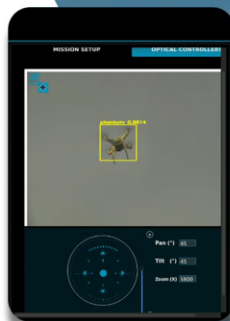




## VIDEO BASED DRONE IDENTIFICATION & TRACKING (VDIT)

The day and night camera sensors are mounted on an automatic servo-based positioning system. This system receives commands for position from RFDD. Once positioned in the direction of interest, captures video and images of drone.

VDIT is capable of capturing and tracking video up to a range of 3 Km. Video feeds are given to software module and video processing algorithms in the software automatically confirm the presence of drone and imitate tracking.



DAY



NIGHT



**UPTO 3 Km**

(enhanced range models upto 6 Km)  
DETECTION RANGE



**2 MP, 1080**  
RESOLUTION



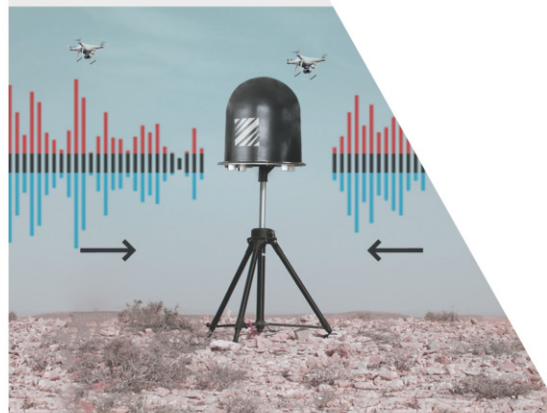
**0° - 360°**  
PAN



**-20° - 70°**  
TILT



## RADAR DETECTION



Detection of autonomous drones (flying without a link between drone and operator) using RFDD, is not possible. RADAR provides the best choice to detect such threats. An X band 2D/3D RADAR detects the drones as per the RADAR detection range specifications and provides precise data for target coordinates both in Azimuth and elevation. The feed from the RADAR is integrated to the data fusion centre for effective detection and monitoring of the threat.

## HARDKILL INTERFACE

Zen Anti Drone system is offered with integration of Hard Kill options. Standard Air defence guns interface and a Net based drone catcher are the two options available. Gun interface can feed coordinates to the gun and align it to the target ingress direction to destroy it physically. Regulatory permissions required to use such solutions shall be

obtained by the users. In order to capture the drone and land it at a safe place, net-based drone capture option can be employed. For this, a dedicated drone with a hanging net could be launched to capture the rogue drone. This option is suitable for small rogue drones carrying potentially damaging explosives.



## DATA FUSION & COMMAND CENTER

This module integrates the data from RFDD, VDIR and Radar. Detection and classification algorithms based on all sensors are built into this system. An integrated display system enables the display of the threat situation.

This display system integrates the Map with zones of threat. Provision to define the area of monitor, zone of threat, zone of identification of threat etc is given in the console. Spectrum and waterfall screens are also part of the software, which provide the complete picture of the detected emissions.



## DRONE RF JAMMER



OMNI & DIRECTIONAL JAMMING



CAPABLE TO JAM SWARM OF DRONES

Drone RF Jammer (DRFJ) is capable to disable the link between GCC and Drone by jamming simultaneously ISM bands, GNSS signals, mobile signal and any other intercepted frequencies. The frequencies detected by RFDD are automatically

taken and jamming waveforms are generated and radiated using the directional antennas. The system also supports user configured frequency to carry out the jamming action. A provision to manually feed the jammer frequencies is also given.



### JAMMER RANGE

#### MODEL DRFJ01

Up to 1 Kilometers directional jamming and up to 0.5 Km Omni jamming

#### MODEL DRFJ02

Up to 3 Kilometers directional jamming and up to 1.5 Km Omni jamming

#### MODEL DRFJ03

\*Higher range models upto 10 Km



### COMMUNICATION FREQUENCY BANDS

All ISM and Wide band system can be provided covering all frequency bands.



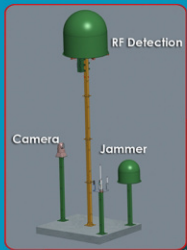
### NAVIGATIONAL FREQUENCY BANDS

**GPS , GLONASS GALILEO , BEDOIU**

Capable to GNSS & Communication Bands simultaneously

“

# IT'S TIME TO ACT FOR YOUR DRONE PROTECTION DOME.



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