

ROGUE DRONE AND PILOT DETECTION BY RADIO- FREQUENCY ANALYSIS

To counter the new drone security threats, HYDRA is a powerful and flexible 1st line of defense whether you are looking for a versatile solution or a high performing detection technology to be integrated in a multilayer Command and Control system.



Drones: a growing concern

Because drones can guarantee the **anonymity and impunity of their pilots**, they have become the perfect tool for malevolent actors. **Small, nimble, inconspicuous, affordable, easy-to-use** and able to transport diverse payloads with increasing levels of autonomy, drones today bypass all traditional security measures and put all critical sites at risk. Risk of attack or collision, vector of espionage or contraband: malevolent drone intrusion scenarios are numerous.

Our mission

Since 2015, CERBAIR has **secured its clients' near airspace** with high-tech solutions. To cope with the **asymmetrical threat** posed by drones, CERBAIR aims at **democratizing high performing solutions** to protect the many with its unique approach:

- Highest Cost-Efficiency on the market
- Mobility and Simplicity of use
- Modularity and Upgradability

HYDRA

CERBAIR's **core technology**, HYDRA is a range of drone detection solutions based on **radiofrequency analysis**. Similar to the mythological multi-headed snake, HYDRA relies on a **scalable number of sensors** (see visual on right corner) installed on top of a mast and working together thanks to our **signal intelligence algorithms**.



Key takeaways

- Drone and pilot detection
- Direction finding on drone and pilot (bearing $\pm 10^\circ$)
- Average detection range: 2km
- Drone type identification
- Very low rate of false alarms
- Passive solution: zero interference
- Ease of installation: 20 min / 2 PAX
- Modular, evolutive and highly configurable

Why detect?

Drones are becoming **more and more discrete** to the point that it has now become unrealistic to expect detecting them with one's own senses. Without proper detection, no action can be taken. Therefore it is crucial to be able **to detect, identify and locate the drone threat in time**. Indeed, these steps are necessary to trigger a countermeasure so as to neutralize the drone or alternatively to indirectly nullify the drone threat (pilot arrest, VIP extraction...).

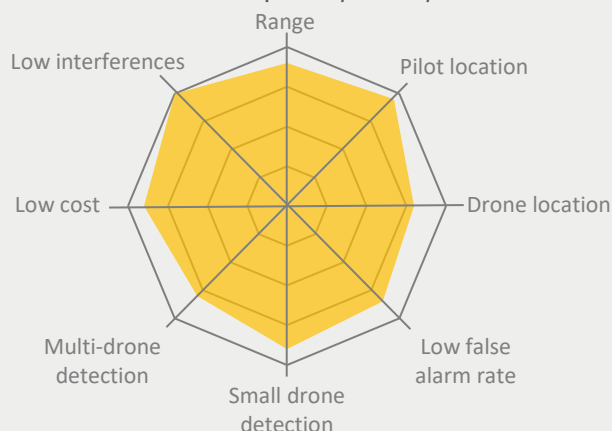
Several technologies allow to detect drones: RF, radar, acoustics and EO/IR. Although each presents its own strengths and weaknesses, radiofrequency analysis undoubtedly is **the most balanced drone detection**.

Because it is a **high performing, affordable and non interfering technology**, radiofrequency analysis is a **powerful 1st line of defense** to detect the presence of rogue drones, especially in complex urban environments.

Of course, given that no technology is infallible, the **integration of complementary drone detection technologies** can help counter the most sophisticated drone attack scenarios.



Radiofrequency Analysis



HYDRA solutions composition

Hardware

- Detection pod : sensors, antennas and cables.
- Client server or hypervisor integration.

Software

- Perpetual software license.
- Major functionalities:
 - Dashboard with 2D satellite views.
 - Sensors and effectors settings.
 - Alert history for FORENSIC.
 - Real-time RF spectrum scanning.

Service

- Site reconnaissance.
- System calibration and training.
- Hardware warranty and software maintenance.

SOLUTIONS CHARACTERISTICS

HYDRA 100



1 km

2,4/5,8 GHz
(Optional : 433/860/915 MHz)

Omnidirectional
on all RF spectrum

1
(2 if extended spectrum)

Yes

2 km for maximum coverage

Sensor(s), filters, antennas, cables,
mountings, server, client, perpetual
software license

IP67

-20°C to +55°C

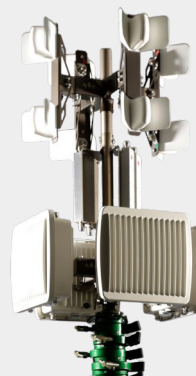
48x48x160 cm
(48x48x210 cm if extended spectrum)

10 kg
(17 kg if extended spectrum)

Ethernet 1000 Base T (Gigabit)

PoE+ (802.11at) (max 30W/sensor)

HYDRA 200



2 km

2,4/5,8 GHz
(Optional : 433/860/915 MHz)

Bearing +/- 10° on 2,4/5,8GHz
(Omni on lower RF spectrum)

4
(5 if extended spectrum)

Yes

4 km for maximum coverage
1 to 2 km to cross bearings

Sensor(s), filters, antennas, cables,
mountings, server, client, perpetual
software license

IP67

-20°C to +55°C

48x48x78 cm
(48x45x240 cm if extended spectrum)

25 kg
(32 kg if extended spectrum)

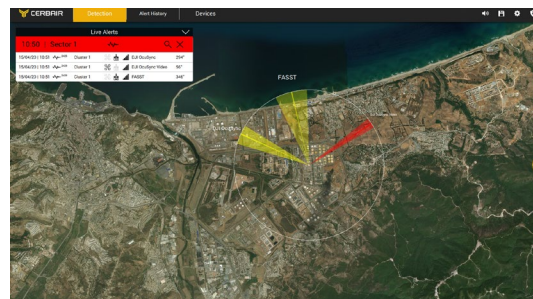
Ethernet 1000 Base T (Gigabit)

PoE+ (802.11at) (max 30W/sensor)

CAPTEUR RF

Scalability

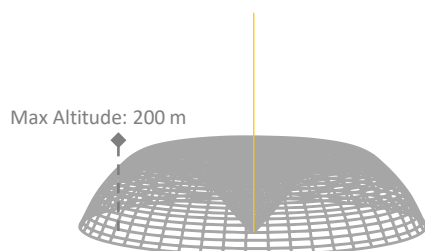
- Possible combination of HYDRA 200 solutions to cross bearings (see visual).
- Possible combination of HYDRA 100 and HYDRA 200 solutions to implement a network of sensors adapting to a site particular topography and obstacle layout.
- Unified control of all installed HYDRA solutions via a unique client server.



Range

Several factors can impact the detection ranges such as the drone model, local RF pollution, topography, surrounding constructions or weather conditions.

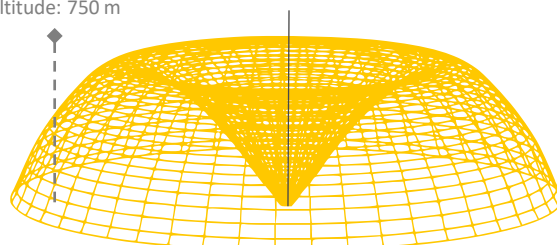
HYDRA 100



Optimal conditions:	2,5 km	-----◆
Normal conditions:	1,5 km	-----◆
Bad conditions:	1 km	-----◆

HYDRA 200

Max altitude: 750 m



Optimal conditions:	5 km	-----◆
Normal conditions:	2 km	-----◆
Bad conditions:	1 km	-----◆



Mobility kit

To temporarily protect a sensitive site or event. Includes a semi-rugged laptop, transport cases, a telescopic mast and a switch.



Spectrum extension

To increase the detection coverage by adding low frequency ranges on which several rarer drones can operate.



Ruggedness

Of the laptop to deploy it under the harshest conditions.



Integration

Of complementary detection and neutralization* technologies into HYDRA C2.

Client references



French Ministry of Defense

CERBAIR is proud to equip several units of the French Army with its anti drone solutions.

G7 in Biarritz

CERBAIR was honored to take part in securing the 2019 G7 summit from drone threats.



Colombian Air Force

CERBAIR actively protects some bases of the Colombian Air Force from potential drone attacks.



“CERBAIR proved to be a company that perfectly understood the drone threats and the means to protect from them. [...] Their deep knowledge of anti drone technologies involved in detection, identification and neutralization [...] their toolbox approach [...] are key assets to secure your near airspace from malicious drones with the highest level of professionalism.

Stéphane Durand, CEO



CERBAIR's radiofrequency based technology detects the vast majority of civilian drones in the air today. It is easy to install, integrates seamlessly into existing security systems and is controlled by a user-friendly interface that allows its operations to be up and running quickly, saving time and money.

Jean-Michel Aulas, Chairman”



SCAN ME

Partner of **MBDA**
MISSILE SYSTEMS

CERBAIR is supported by several **prestigious investors** including MBDA (European leader in missile and missile guidance system), ensuring the sustainability of the company. Together, we work hard on designing complete anti drone solutions for armies.