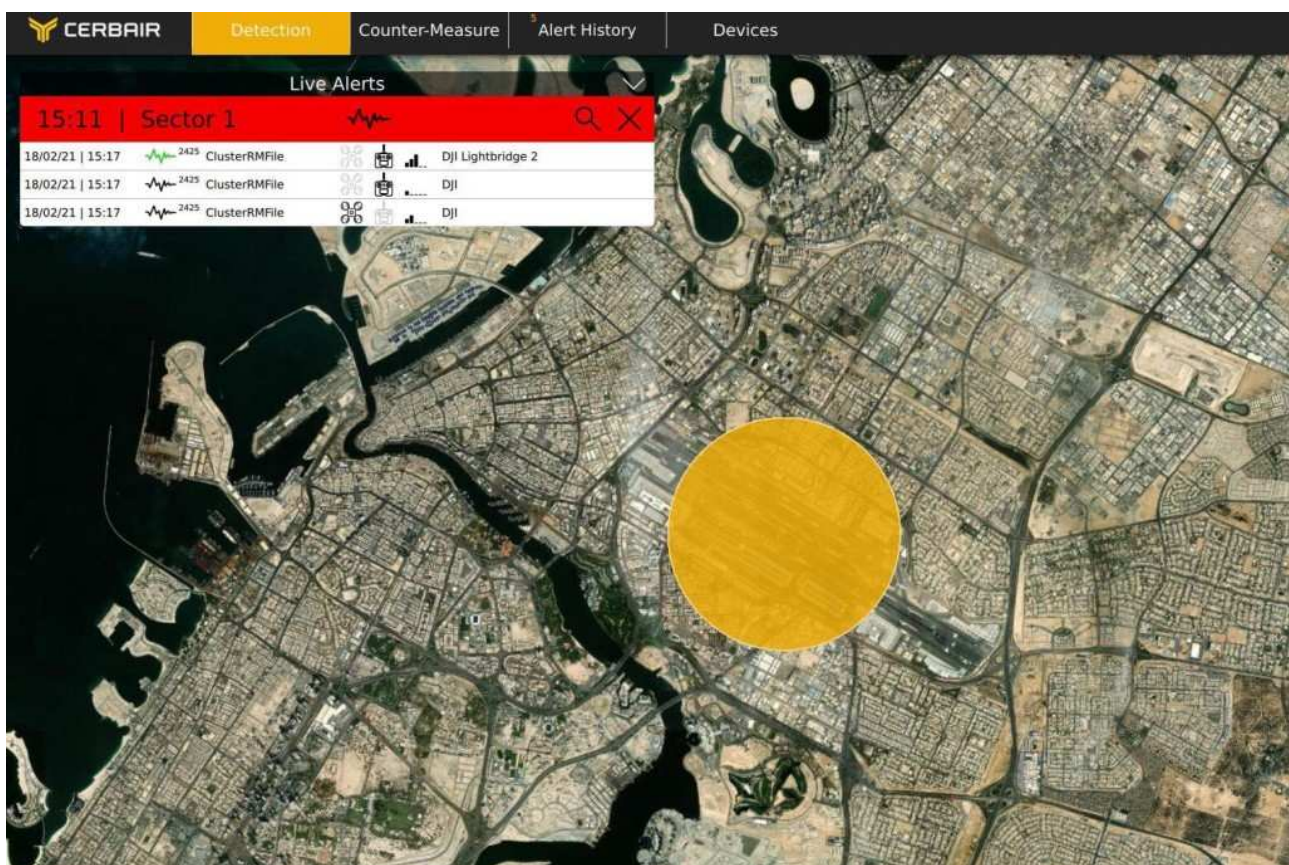


“ULTRA inside”: CERBAIR goes deeper into rogue drone detection with a unique feature

20 February 2021 - Since 2015, CERBAIR has based all its detection solutions on the analysis of the radiofrequency spectrum. Called HYDRA, it is a direction finding system with sensors that scan the electromagnetic spectrum for frequencies used by the communication protocols of commercial drones.

As soon as a signal is intercepted, HYDRA characterizes it by comparing it to a signature database and gives operators an azimuth of origin symbolized on the interface of a command and control center (C2). The device is coupled with MEDUSA, a specially designed jammer, actionable when the threat is clearly confirmed. This radio jamming cuts the communication link between the drone and its operator, thereby forcing the machine to land.

Finally, CHIMERA is the combination of these two systems for special forces (police, gendarmerie, army, etc.). Composed with 3 connected hardware items: an antenna, located in the dedicated backpack, a digital C2 (Command and Control) tablet attached to the front of the tactical vest, and an effector. CHIMERA allows a single operator on a mission to detect and neutralize nefarious drones.



Reliability of detection

“Our customers, such as French SWAT Unit (RAID) or the soccer team l’Olympique Lyonnais, reported an increasing number of false alarms in environments saturated with electromagnetic radiations,” underlines Céline Craye, PhD - Lead Developer, recalling the origin of this unique feature on the market.

“The core of our detection is based on a mapping of the frequency / time space” explains Pierre Dufour, RF Engineer, who carried out extensive research on deep packet inspection. “By

performing a first detection, we identify the overall characteristics of the packets sent between the drone and the remote control (packet duration, bandwidth, etc.), then we apply a first filter on the entire spectrum to precisely isolate the potential packets emitted by a given model of drone. After this crucial step, ULTRA (**U**ltimate **R**ecognition **A**lgorithm) analyzes the content of the packet to detect patterns of each communication protocol. If these indicators are present in the package, we can confirm with absolute certainty the nature of the drone,” explains Céline Craye. In short, ULTRA scrutinizes both the interpulse data (the relative positions between the different transmitted packets) and the intrapulse data (data relating to a packet).

“While developing this unique feature, we found out that the biggest challenge was to get the clearest signal possible. For several months, we analyzed multiple recordings and carried out thousands of tests, both in our lab of Montrouge, and on the field in the outskirts of Paris,” conclude Céline Craye and Pierre Dufour.

Symbolized by a green pulse on the detection software, ULTRA is available on HYDRA 100/200 and the future HYDRA 300 (fixed or mobile). ULTRA is already included in the latest release of the CHIMERA software.

Unlike its competitors seeking ever more detection range, CERBAIR innovates by investing in more reliable detection, eliminating as much as possible false alarms which can generate costly and unnecessary actions for the user.

Photos courtesy Cerbair