



Autonomy-as-a-Service

**UNMANNED LIFE**

**AUTONOMOUS SURVEILLANCE**

DRONE SWARM & AI ENABLED SECURITY



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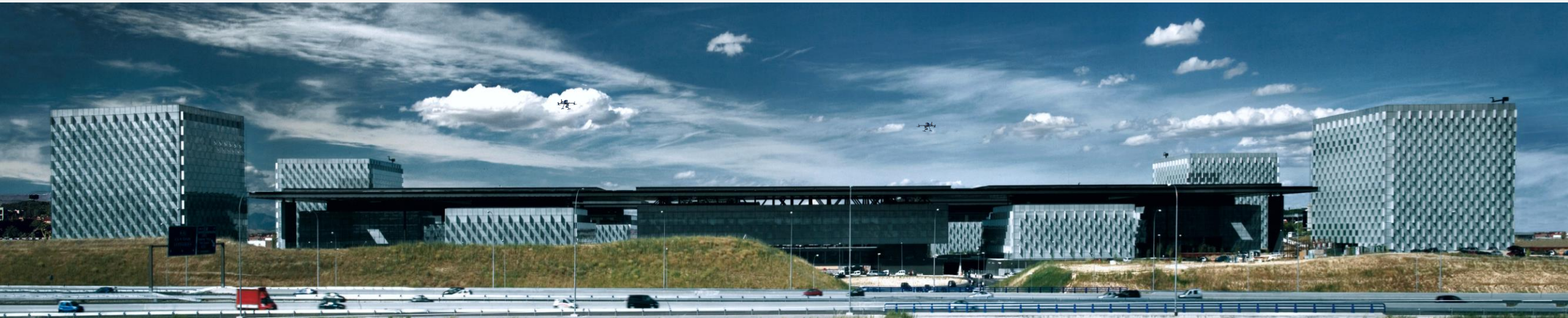
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# UNMANNED LIFE

**LIVE RECURRING AUTONOMOUS SURVEILLANCE**

**DISTRITO TELEFONICA IN MADRID**

Features And Capabilities Used in the Missions



# AUTONOMOUS DRONE SWARM SURVEILLANCE

Distrito Telefonica Security

An autonomous flight zone has been identified to perform security rounds in the Telefonica Headquarter Towers in Madrid.

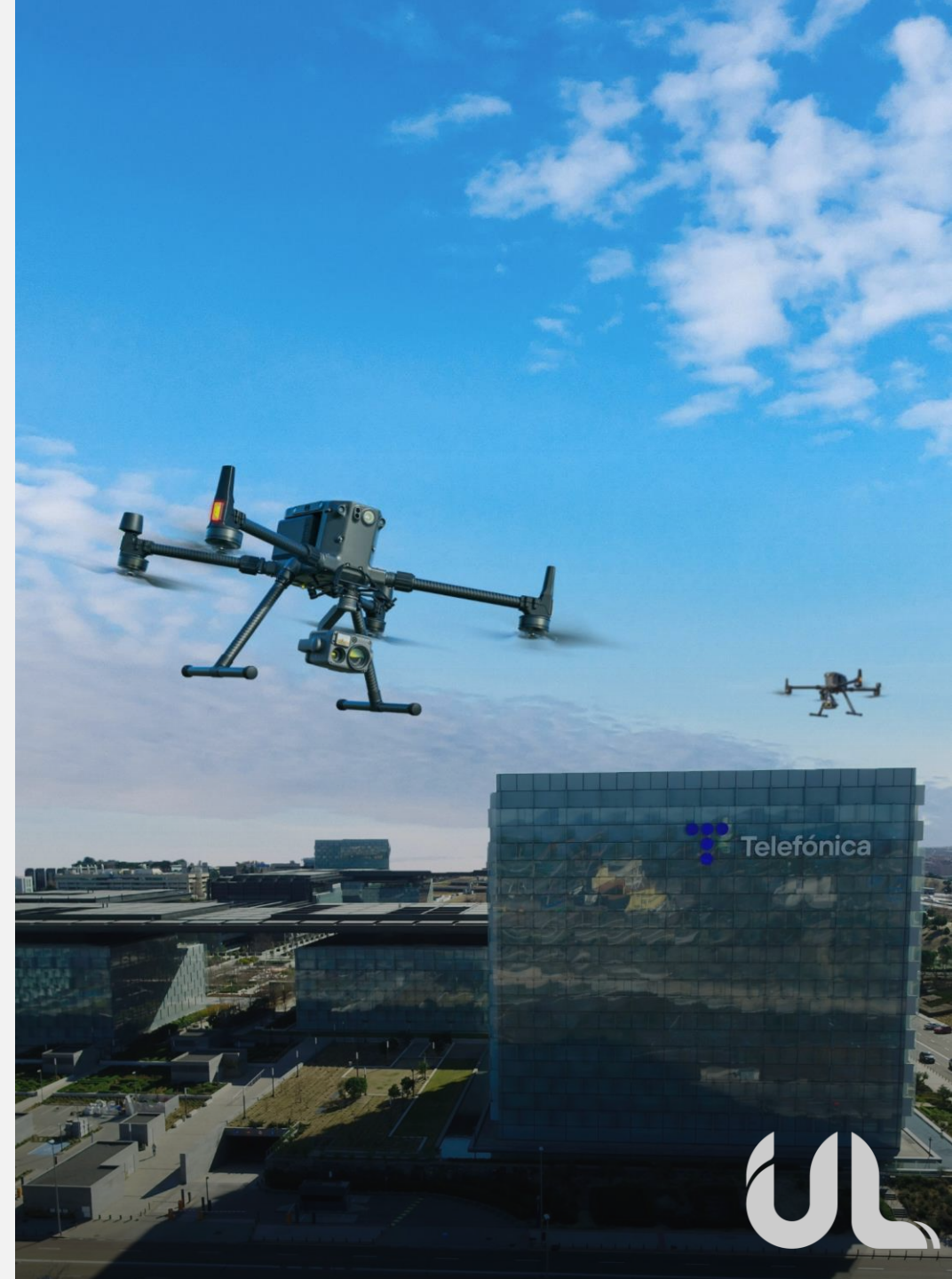
Operators can select a flexible area to Surveil on the interface or use the pre-determined area between the towers for a general mission.

A swarm of two 5G-enabled drones then calculate the route in real-time and perform autonomous surveillance.

Real-time video streams are enhanced with artificial intelligence on the edge, such as the detection of unauthorised persons at the site.

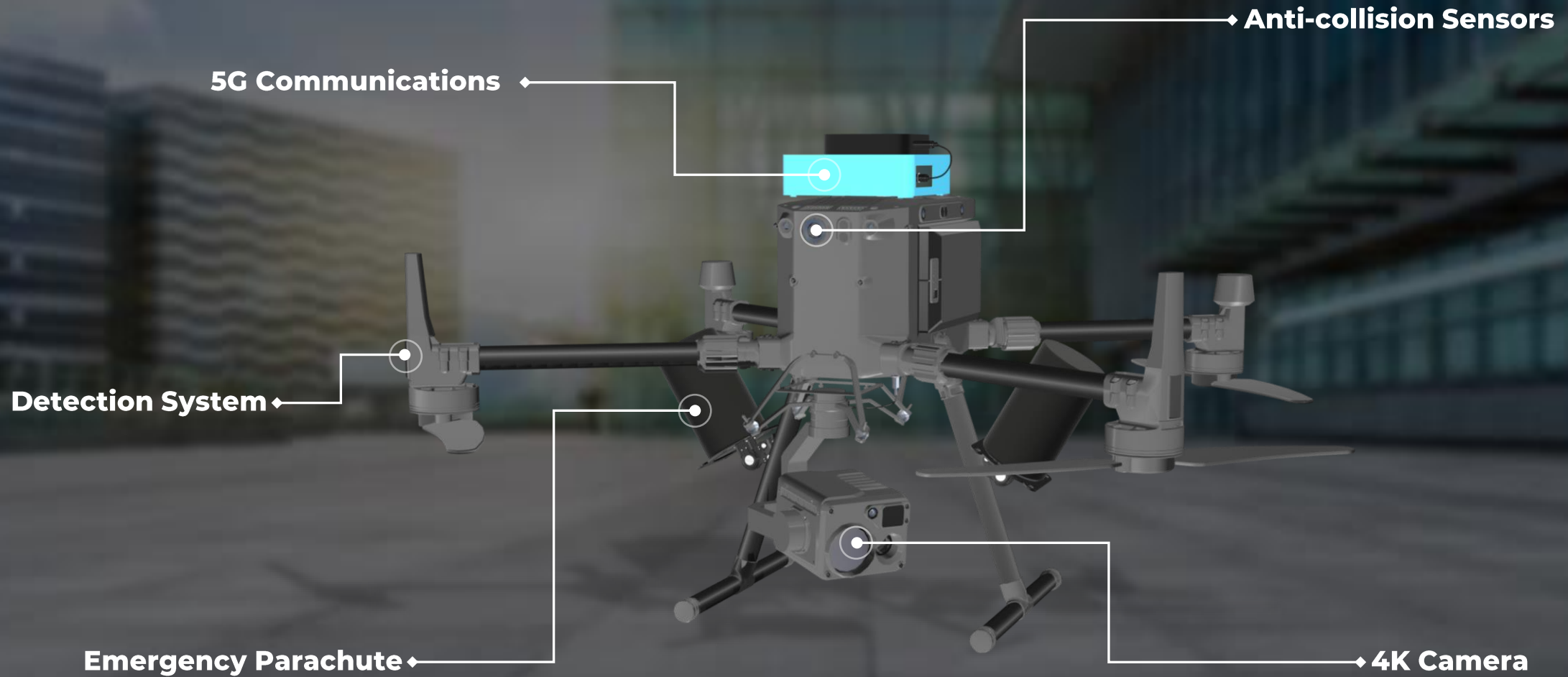
These videos are streamed to the central security system in real-time for security monitoring, and alert the system if an unauthorized person is detected.

<https://www.telefonica.com/en/communication-room/telefonica-launches-autonomous-drone-fleet-management-solution-maximise-security/>



# AUTONOMOUS DRONE SWARM SURVEILLANCE

Overview of the Drone components



# AUTONOMOUS DRONE SWARM SURVEILLANCE

## Deployment Features

TELEFONICA DEPLOYMENT FEATURES	
<b>HARDWARE</b>	2 Platform Enabled DJI M300 RTK Drones
<b>MISSION TYPE</b>	Pre-defined area and timed missions, or on demand if needed
<b>LEVEL OF AUTONOMY</b>	Fully autonomous flights. No input required beyond mission setup.
<b>CENTRAL SYSTEM</b>	Telefonica Headquarters central security system
<b>AI ALGORITHM</b>	Unmanned Life's In-House algorithm for person detection
<b>NETWORK</b>	Telefonica 5G Public Network
<b>COMPUTING CAPABILITIES</b>	Edge Computing, Telefonica Infrastructure
<b>FLIGHT PERMITS</b>	Private Land in close proximity to Madrid Airport, 3 heliports, and in Madrid's metropolitan area. Permits acquired



# AUTONOMOUS DRONE SWARM SURVEILLANCE

Complex Area Of Surveillance



Telefónica opened its new headquarters in the urban expansion area of Las Tablas, north of Madrid in 2006.

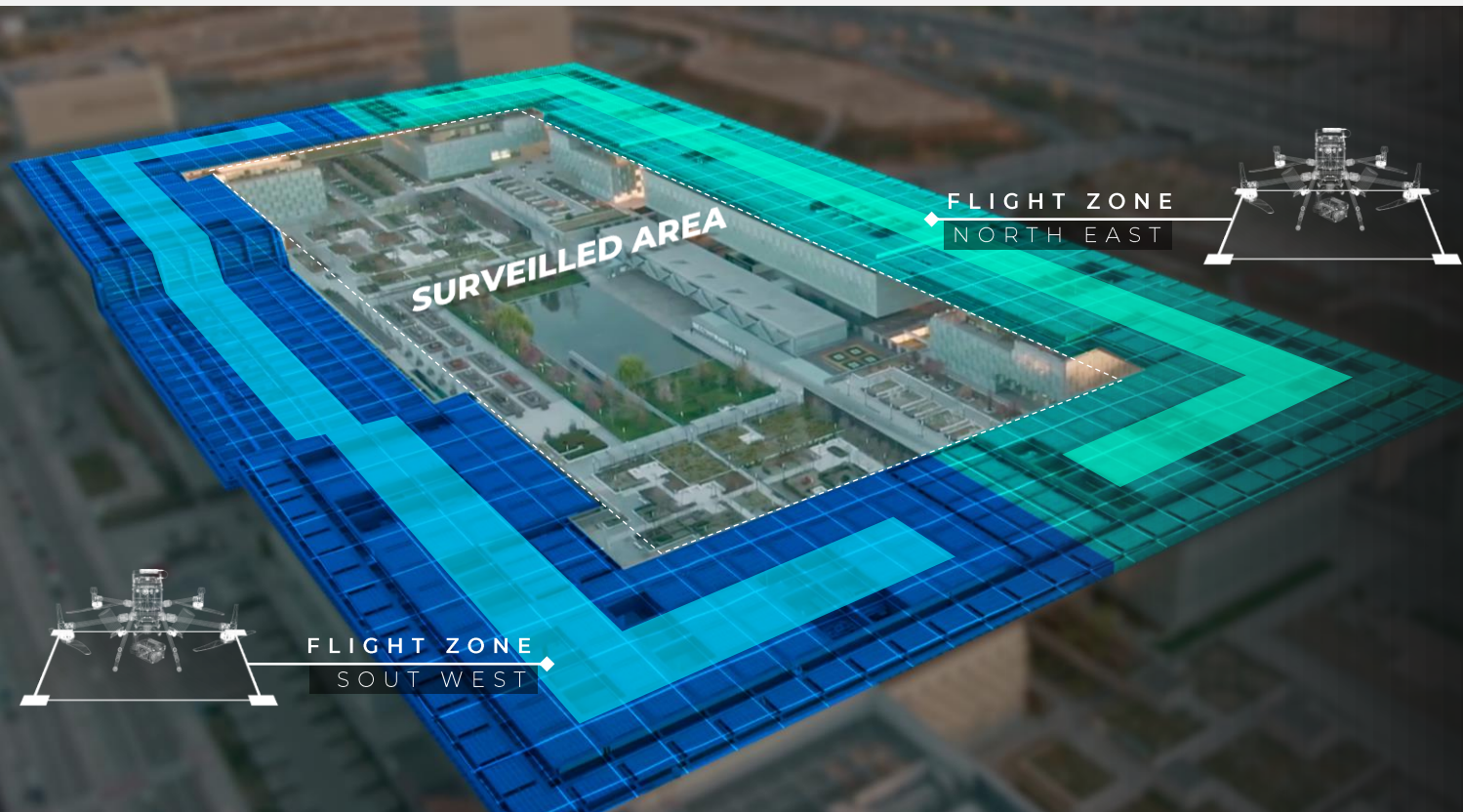
The mission was set in a highly complex environment in terms of regulation due to its proximity to Madrid Airport, Madrid's metropolitan area and heliports.

This security solution is a PIONEER in autonomous flights, being the first corporate headquarters at national level to obtain all the relevant authorisations and deploy it.



# AUTONOMOUS DRONE SWARM SURVEILLANCE

Flight Zones, Are of Surveillance, and Key Benefits



**AREA OF SURVEILLANCE** - 200m x 400m

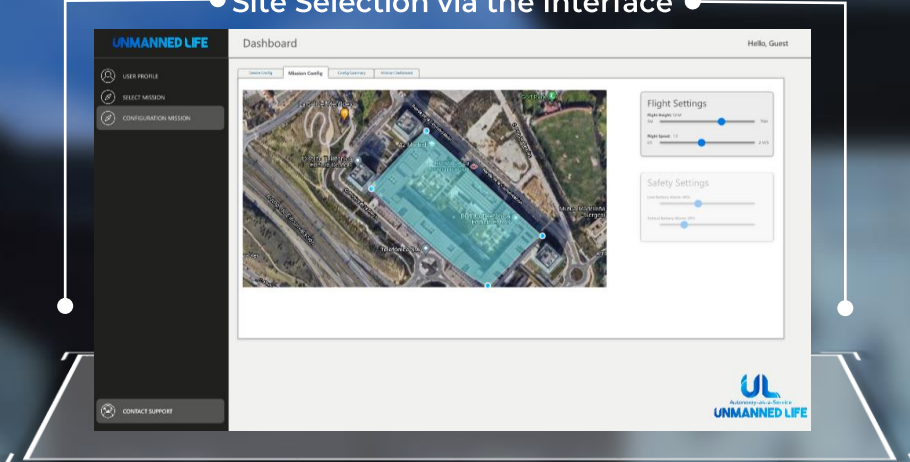
**POPULATION DENSITY** – Over 20,000 people

**MISSION TIME** – Under 10 minutes

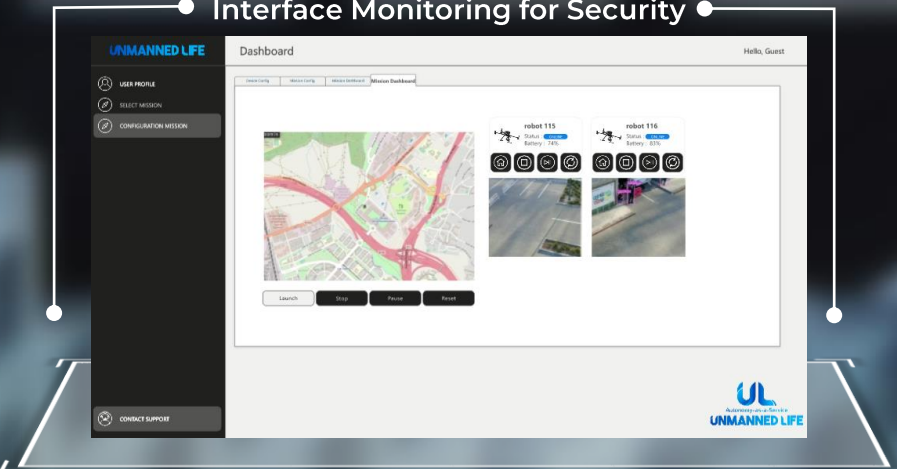
**INCIDENCE RESPONSE vs Manual** - 2.3X Faster

# Telefonica Deployment in Pictures

Site Selection via the Interface



Interface Monitoring for Security



AI Detection for Trespasser recognition



Drone Swarm for additional / faster coverage







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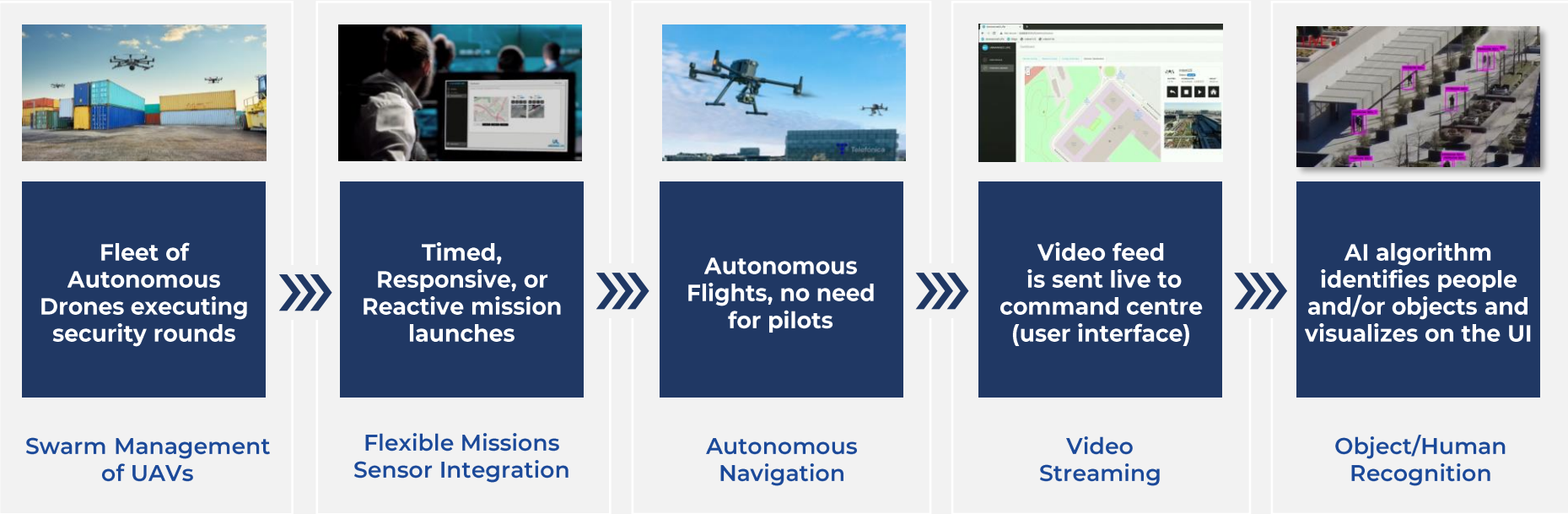
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## **GENERAL SURVEILLANCE DEPLOYMENT**

Process and Capabilities of the Surveillance Vertical



# AUTONOMOUS DRONE SWARMS FOR SECURITY & SURVEILLANCE



**Integration with End users IT systems**



# FLEET OF AUTONOMOUS DRONES FOR SECURITY ROUNDS

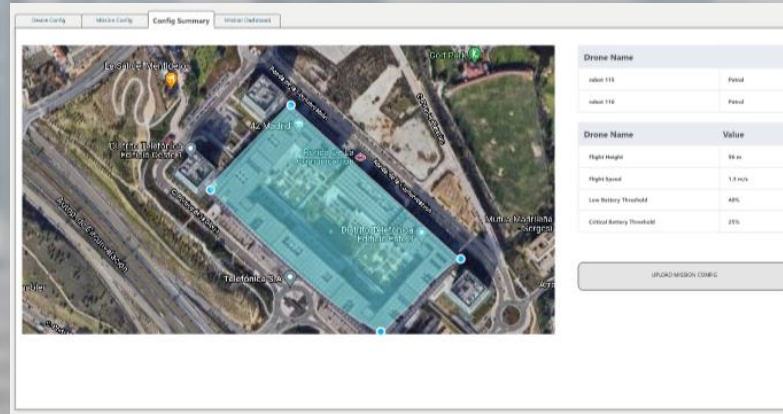
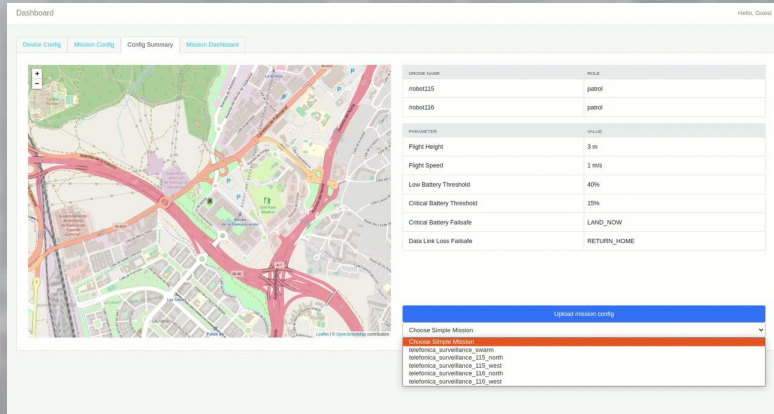
Autonomous Drone Swarms for Security & Surveillance



- » Agnostic drone technology can be deployed on existing drones used by the customer.
- » Different type of drones can be used for different purposes (fixed-wing or multi-copters)
- » Software-driven approach, which ensuring multiple missions deployed at the same time.

# DEFINITION OF THE AREA TO BE SURVEILLED

Autonomous Drone Swarms for Security & Surveillance



## Pre-Defined

Information requirement for pre-planned mission introduced in advance and integrated with the software.



## On-Demand

Operator can request and select area to be surveyed, using the UI.



## Triggered

Software integrated to other IoT systems that can send an alarm to trigger surveillance, after an incident is detected.



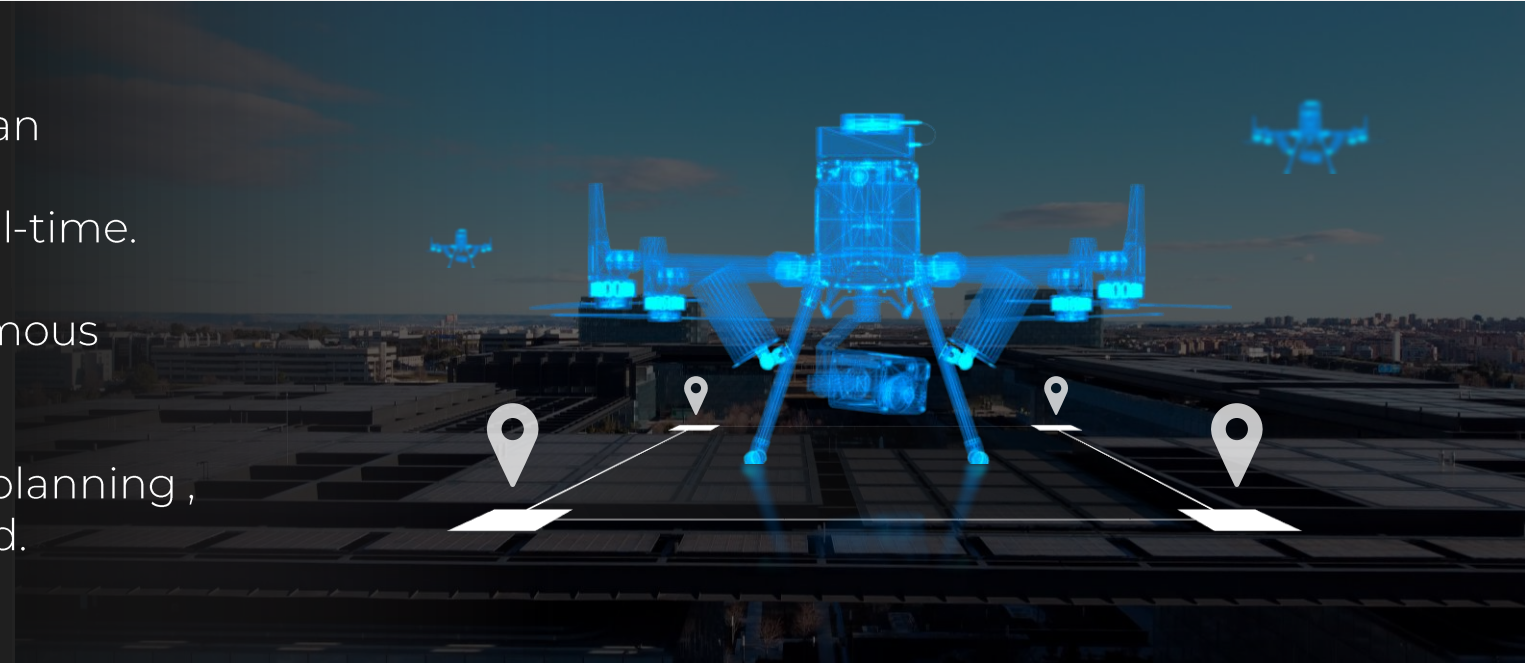
# AUTONOMOUS FLIGHTS, NO NEED FOR PILOTS

Autonomous Drone Swarms for Security & Surveillance

**Autonomous Navigation:** Software acts as an intelligent central brain, coordinating and orchestrating different drone missions in real-time.

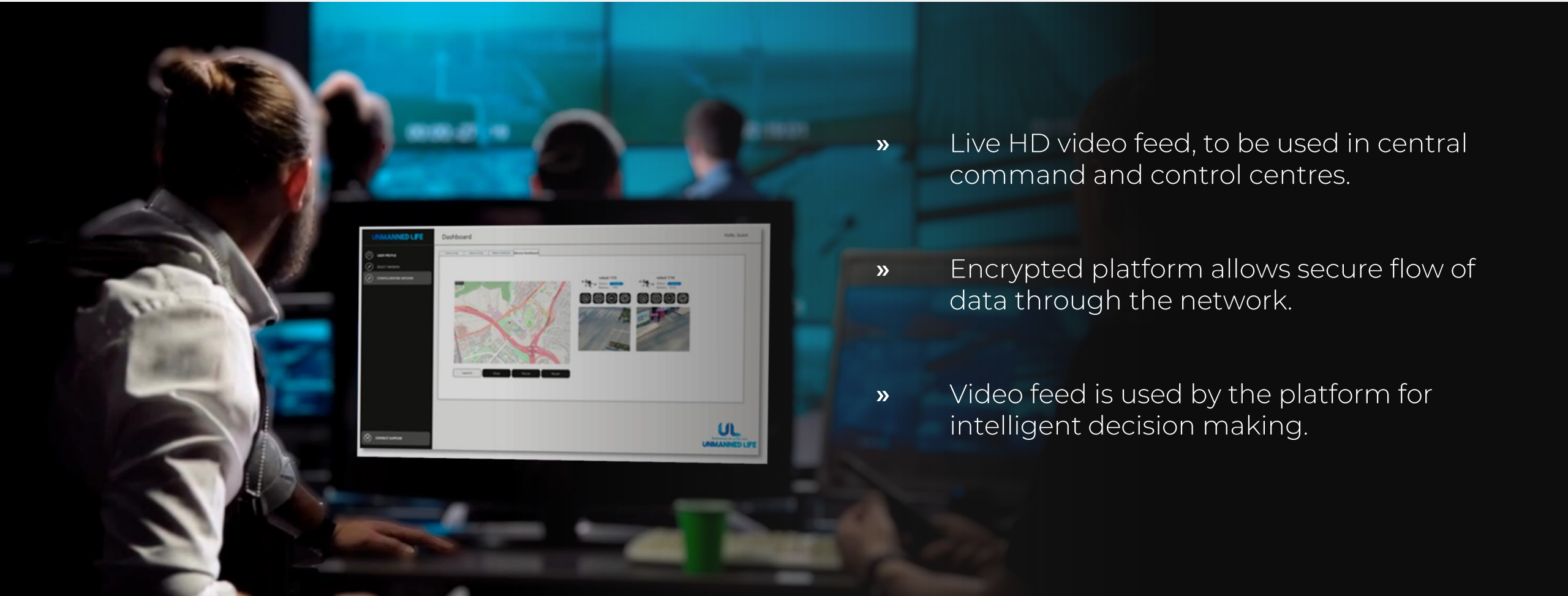
Decision behavior trees allowing for autonomous decision making.

Integration to UTM will allow dynamic path planning, based on restrictions and information available.



# VIDEO FEED IS SENT LIVE TO COMMAND CENTRE (USER INTERFACE)

Autonomous Drone Swarms for Security & Surveillance



- » Live HD video feed, to be used in central command and control centres.
- » Encrypted platform allows secure flow of data through the network.
- » Video feed is used by the platform for intelligent decision making.

# AI ALGORITHM IDENTIFIES PEOPLE / OBJECTS AND VISUALIZES ON THE UI

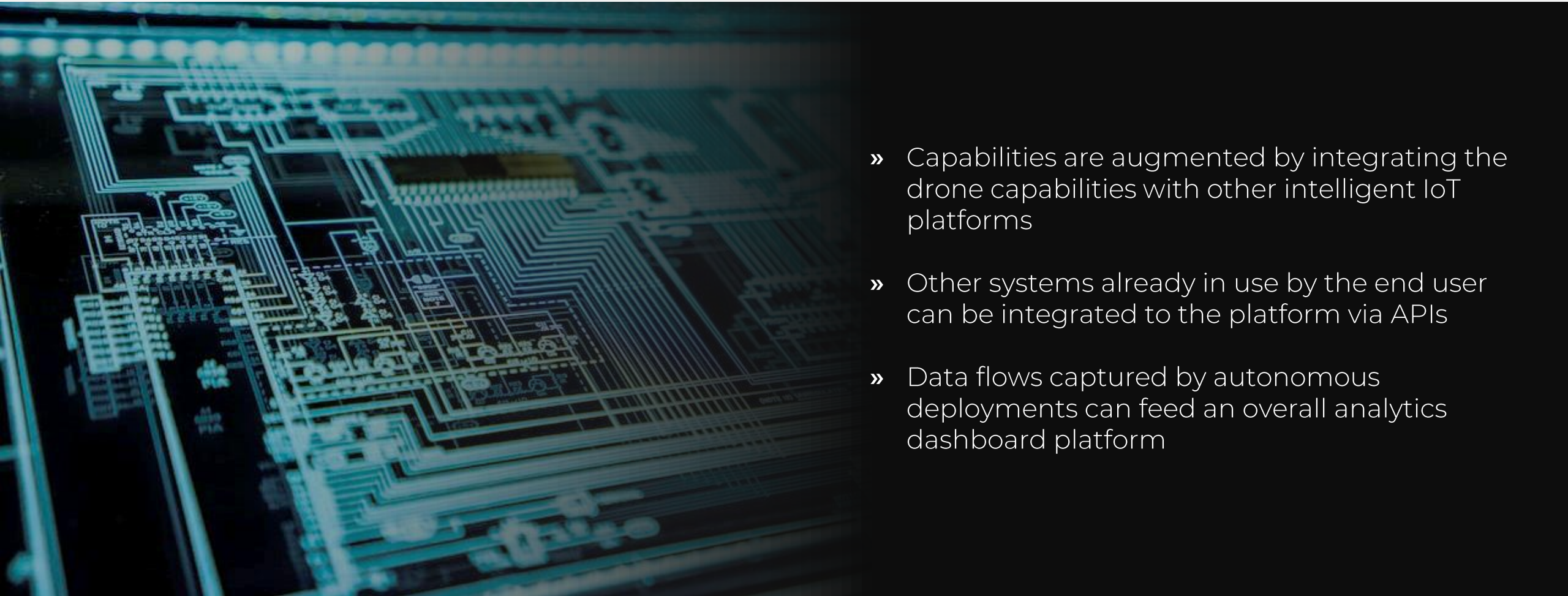
Autonomous Drone Swarms for Security & Surveillance

- » Data captured by the drones is processed by our AI algorithm to feed intelligent decision making
- » Detection of anomalies or unauthorized persons on site triggers the different type of security rounds.
- » Machine learning models further increase the precision of the algorithm over time



# INTEGRATION WITH EXISTING OR AVAILABLE PLATFORMS

Autonomous Drone Swarms for Security & Surveillance

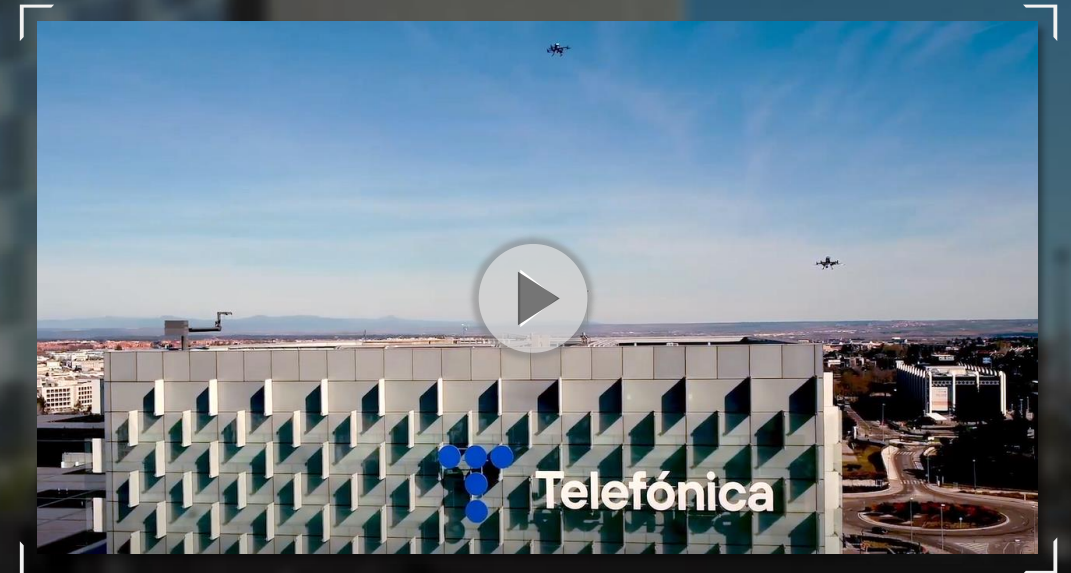
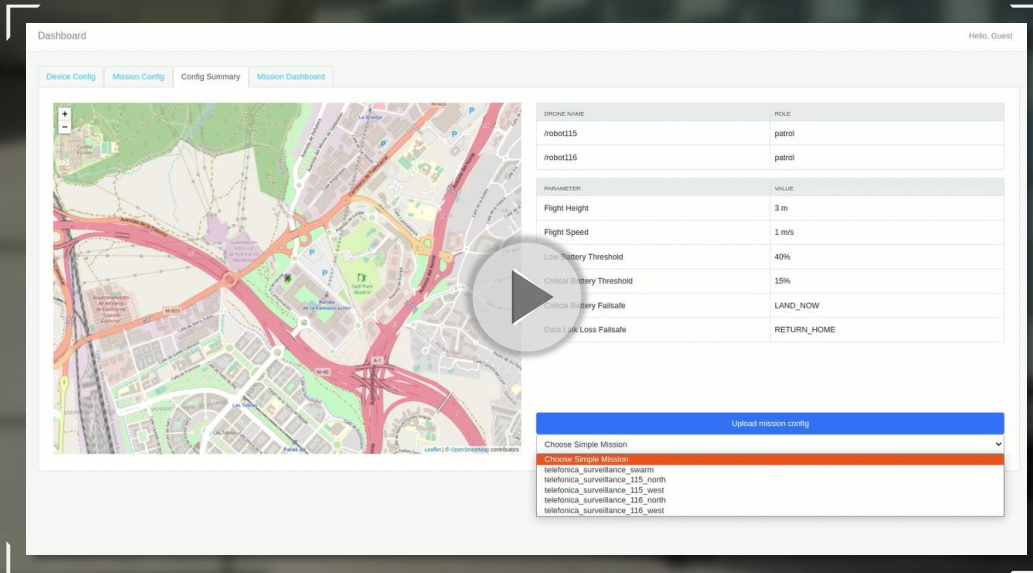


- » Capabilities are augmented by integrating the drone capabilities with other intelligent IoT platforms
- » Other systems already in use by the end user can be integrated to the platform via APIs
- » Data flows captured by autonomous deployments can feed an overall analytics dashboard platform



# DEFINITION OF THE AREA TO BE SURVEILLED

Autonomous Drone Swarms for Security & Surveillance



**End-to-End autonomous mission demonstration**

**Mission description, features, and flight**





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