GUARDION
Countering drones

RELIABLE SECURITY AGAINST THE THREAT OF UNAUTHORIZED DRONES

PROTECTION AGAINST THE THREAT OF UNAUTHORIZED DRONES

NEGLIGENCE

+ Illegal intrusions into no-fly zones such as airports

+ Disruption of daily business causes trouble, e.g. to aviation safety, security & handling of flight operations

+ Claimed damages & possible legal actions

NEXT LEVEL AUTOMATED ASSISTANCE OR MULTIFACED THREAT POTENTIAL?

With a broad variety in size, speed and control mechanisms – from manual up to fully automatic – the ample capacities of drones are paving their way to become an everyday reality in almost every line of business.
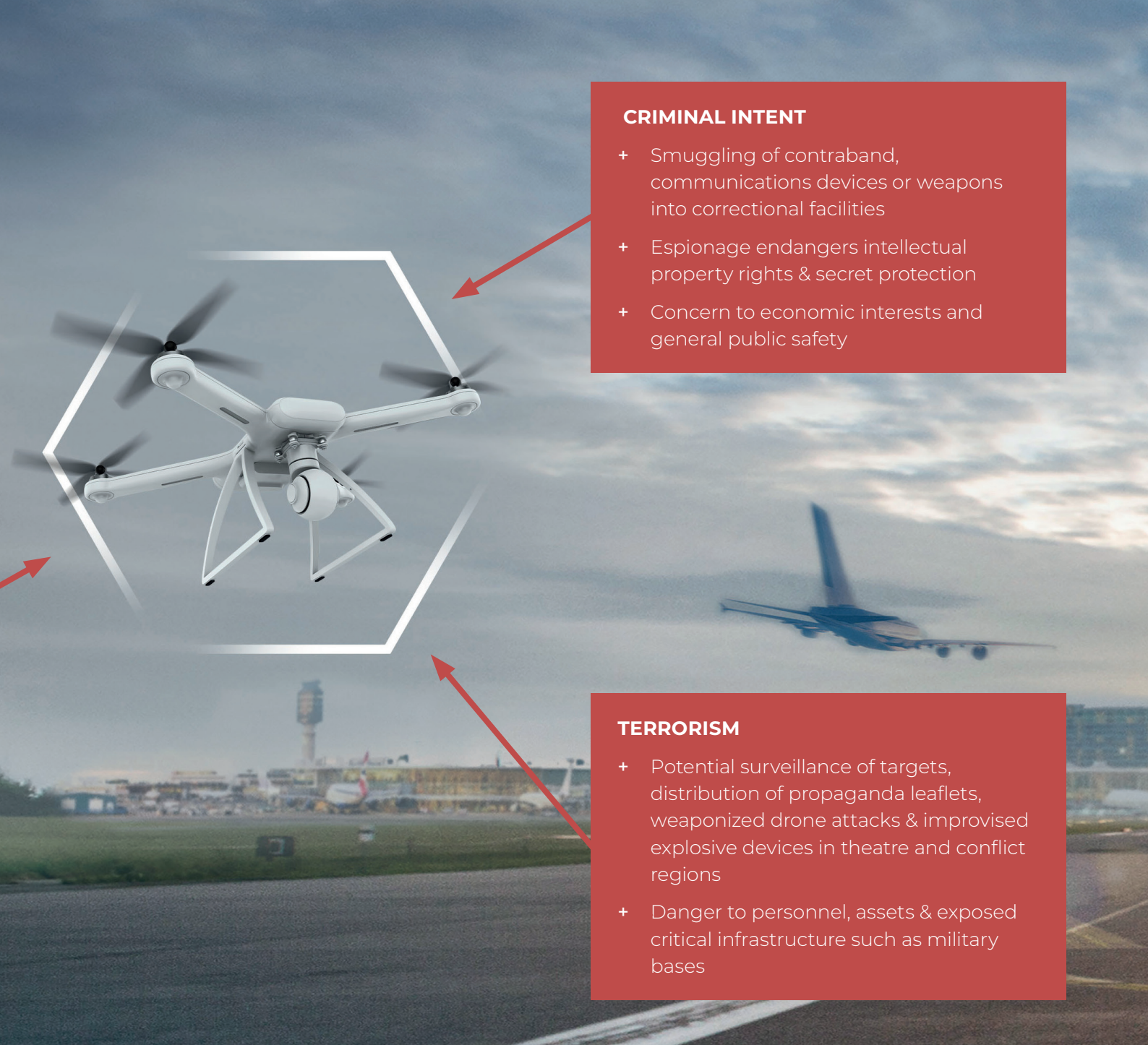
Aside from recreational use for spectacular aerial views or the much anticipated commercial use of drones for improved just-in-time logistic concepts or automated security patrolling – it is precisely their vast potential that makes drones prone to misuse.

FROM NEGLIGENCE TO TERRORISM – THE QUESTION OF INTENT

This technology-driven threat from above opens a whole new dimension of uncertainty and risk potential for heavily guarded and high-tech protected governmental and military estates, industrial facilities, airports or other critical infrastructure.

The level of sophistication in disruption or attack increases tremendously from mere ignorance to criminal intent up to full-scale terroristic purposes – leaving close protection units and corporate security teams with a complex challenge.

CRIMINAL INTENT

+ Smuggling of contraband, communications devices or weapons into correctional facilities

+ Espionage endangers intellectual property rights & secret protection

+ Concern to economic interests and general public safety

TERRORISM

+ Potential surveillance of targets, distribution of propaganda leaflets, weaponized drone attacks & improvised explosive devices in theatre and conflict regions

+ Danger to personnel, assets & exposed critical infrastructure such as military bases

WINNING THE ARMS RACE IN TECHNOLOGY ADVANCEMENT

Besides facing today's threats, ongoing technological advances in the analysis of vast amounts of data and an ever-increasing level of automation call for regular updates and upgrades of future-proof solutions that provide:

+ 24/7 surveillance of protected premises with automatic alarms

+ Best possible situational awareness for enhanced decision-making

+ Options for implementing protective measures that are as effective as proportionate

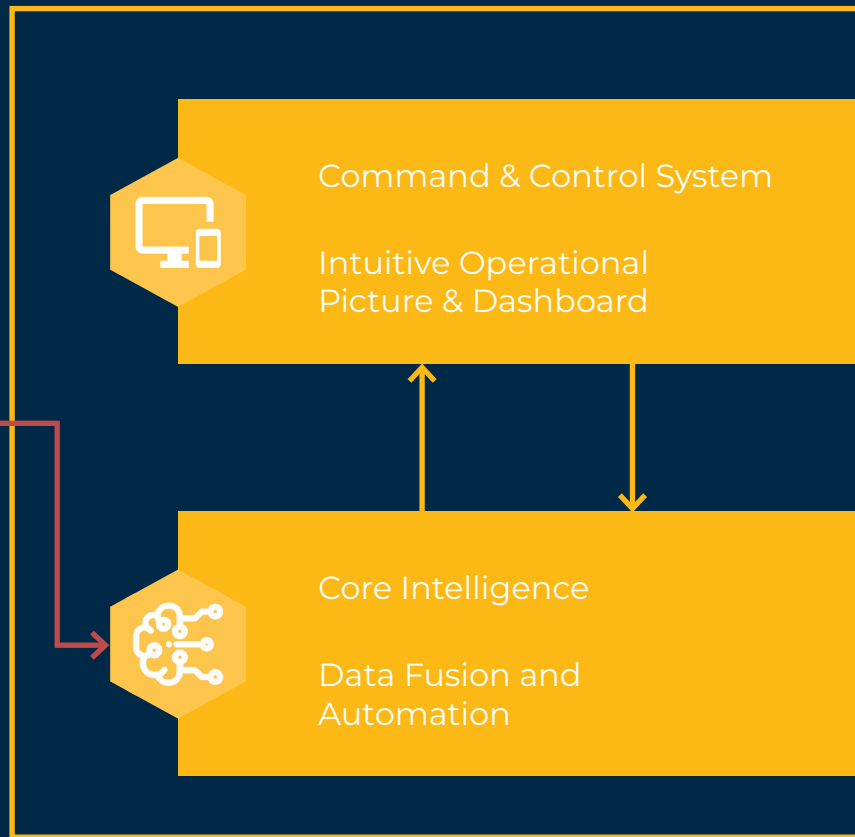## RELIABLE PROTECTION – UNDISRUPTED DAILY BUSINESS

The answer has to be a modular protective shield against the threat of unauthorized drones – no matter where it's coming from or what target or purpose its sender is pursuing.

Ranging from delicate airport operations up to military camp protection under extreme environmental conditions, each of our customers' use cases presents unique challenges, and end users share one common objective –to protect their daily business from unauthorized intrusion and disruption.

DETECT

- RF
- Radar
- Acoustics
- EO/IR Optics
- Other

REACT

Command & Control System

Intuitive Operational Picture & Dashboard

Core Intelligence

Data Fusion and Automation

TRUSTED MODULAR SOLUTION

With more than five years of mission experience working closely with law enforcement and military end users, GUARDION provides comprehensive security via reliable detection and effective countering of unauthorized drones.
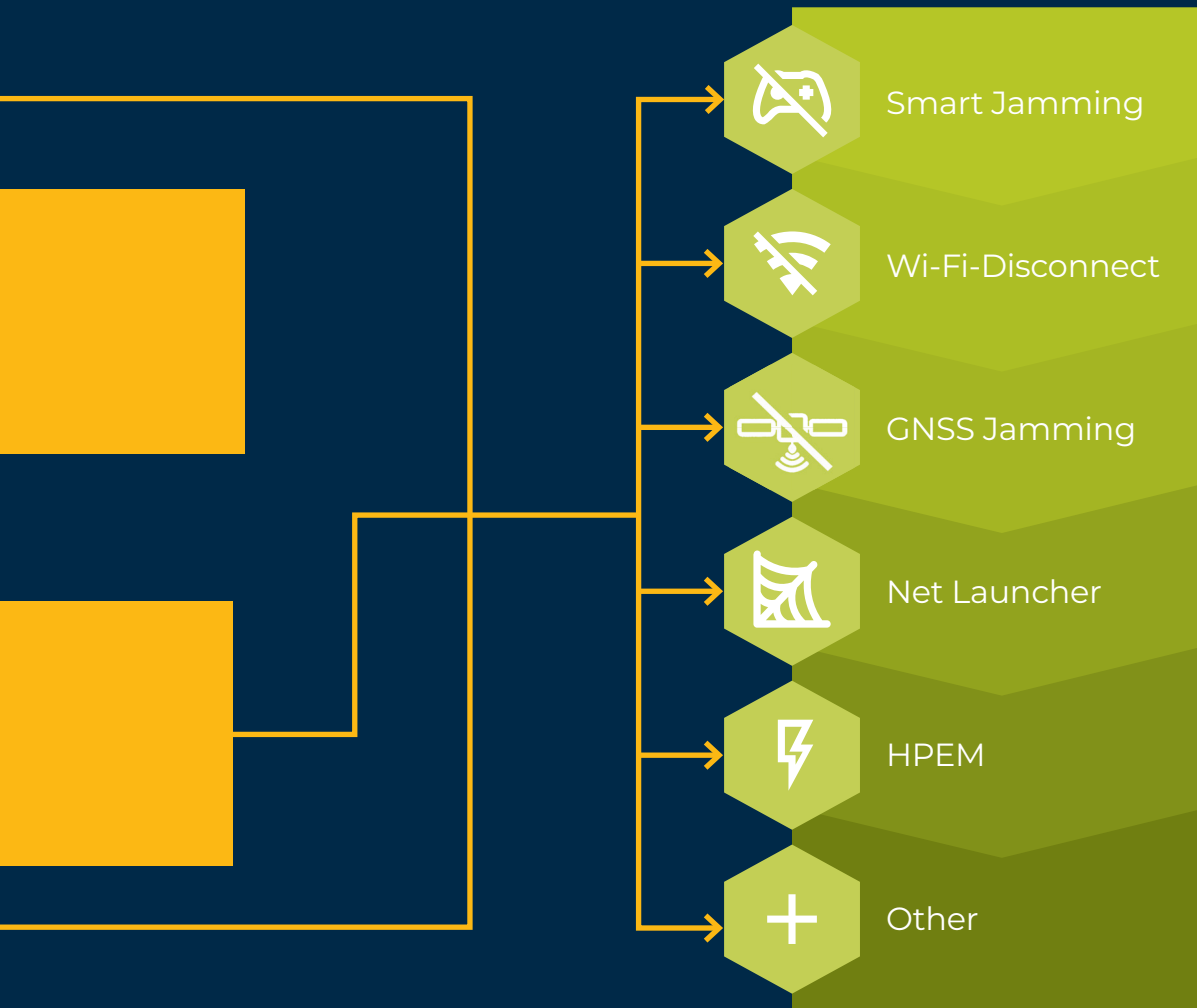
The system features a modular multisensor toolbox design providing customized system solutions for governmental, industry, airports and other critical infrastructure customers – trusted, chosen and approved by military and law-enforcement clients applying the highest level of scrutiny and due diligence.

Our mission is to deliver solutions that are individually tailored to our customers' needs, scalable and future-proof to withstand all challenges now and in the future.

EFFECT

- Smart Jamming
- Wi-Fi-Disconnect
- GNSS Jamming
- Net Launcher
- HPEM
- Other

DETECT

+ Automatic detection, classification & localization of both drone and pilot

+ Multisensor suite with early warning capabilities and minimal false alarm rates

REACT

+ Powerful core intelligence

+ Sensor data fusion and processing

+ Intuitive Command & Control System

+ Reduced complexity of operational picture

EFFECT

+ Effective counter-measures against all control methods (including autonomous UAV)
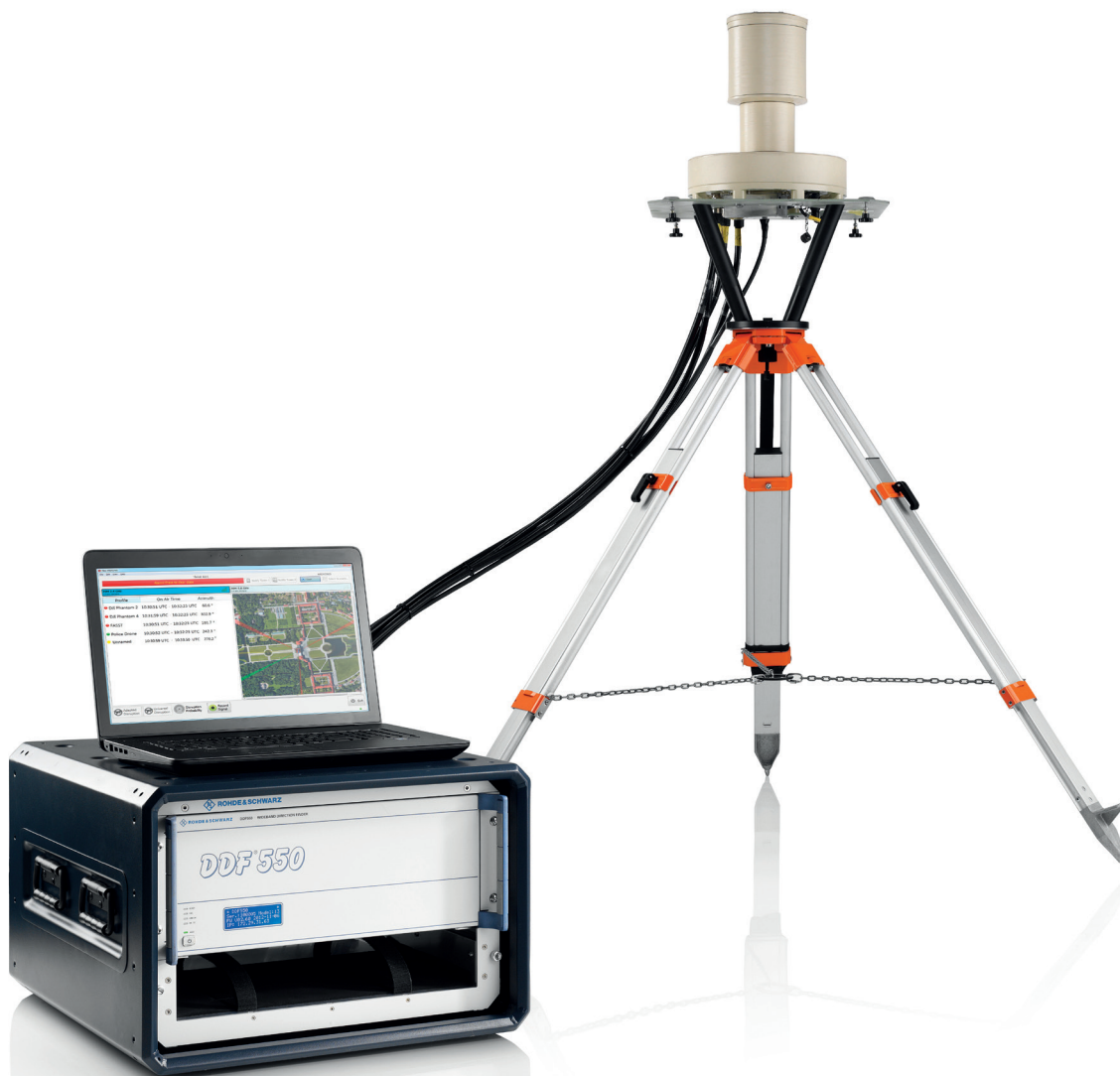
+ Minimal collateral damage

DETECT

Automatic detection, classification & localization of drones and pilots

The complexity of the drone technology in use requires a combination of multiple high-end technologies to reliably detect both the drone in the air as well as its pilot on the ground wherever applicable.

Any automated alarm has to be generated as early as possible to maximise the operator's reaction time and to increase the chances of capturing intruders.

At the same time, the reliability of target classification has to be enhanced to avoid false alarms from cluttering the operational picture.

RF SENSOR:

+ Reliable detection and localization of pilot and drone
+ Early warning capability
+ Passive system with 360° coverage (day and night)
+ For all drone types in all bands
+ Robust in challenging environments

RADAR

+ Active system with 360° coverage (day & night)
+ Special development for small objects
+ Automatic classification and tracking
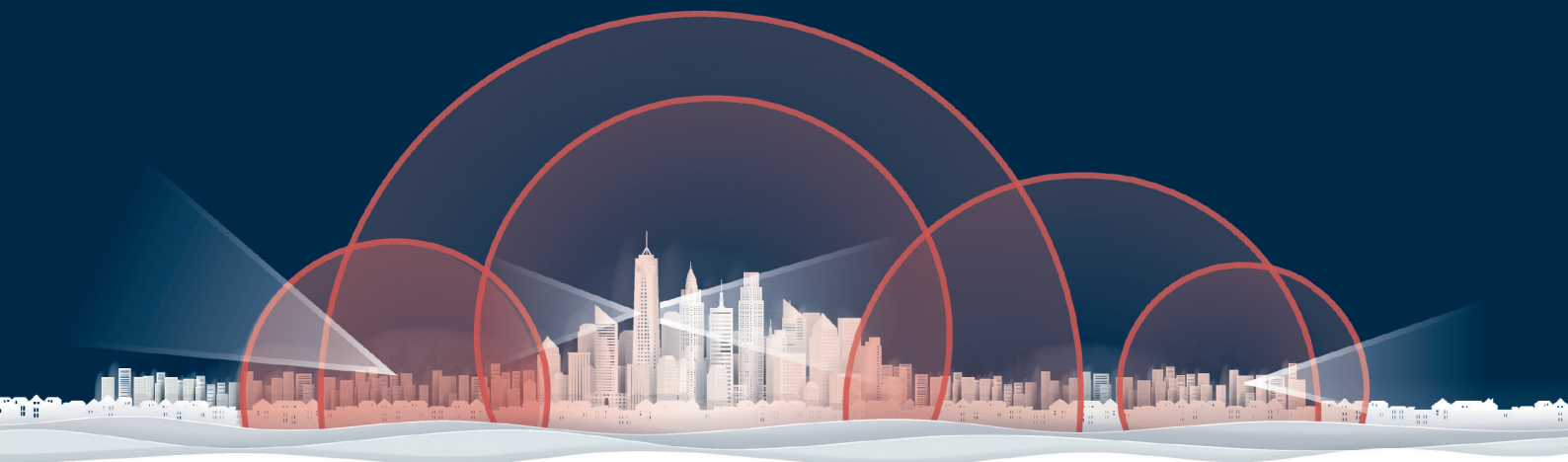+ Optional: target height information (3D) and military ruggedized design

ACOUSTICS

+ Passive system with 105° coverage per panel (day & night)
+ Detection with simultaneous tracking
+ Advanced algorithms for noise classification
+ Military ruggedized design
+ Scalable blind spot coverage (independent of line-of-sight)

OPTICS:

+ Optical verification of detected targets
+ Increasing reliability of target classification
+ Day and night capabilities (EO/IR/residual light amplification)
+ Optional intelligent auto-track and classification function (AI)

REACT

Powerful core intelligence

In the heat of an unauthorized drone intrusion or targeted attack, commanders and their teams have to ensure swift action to protect their assets.

To assist and simplify this decision-making process, operators need an intuitive operational picture showing the current threat situation at a glance as well as to share this information securely and in real-time with all forces involved - in the control centre, in the air and on the ground.

Enhanced algorithms enable ever-increasing levels of automation by displaying only the most relevant set of processed and evaluated target information. This reduces the overwhelming complexity of both high-tech threat and deployed counter-UAS (CUAS) technology to a manageable level.

Plug-and-play solutions facilitate quick and easy set-up. The military backbone of the system enables reliable interoperability of multiple systems. This allows for modular and scalable system designs in complex large-scale operations or properties and ensures central oversight even for widely dispersed sites in theatres.

Core Intelligence

+ Open interface architecture
+ Enhanced algorithms for sophisticated processing and fusion of heterogenous sensor data
+ Decision support, assistance functions and threat management system – automatic prioritization of high-risk targets in multi-threat scenarios, flight path prediction & suggestion of suitable countermeasures

Command & Control System

+ Based on proven military artillery command & control (C2) system
+ Scalable and networked C2 system providing comprehensive situational awareness even in dispersed multi-site scenarios
+ Secure communication in real-time between C2 systems and mobile forces
+ Interoperability with superordinate C2 systems

Intuitive Operational Picture & Dashboard

+ Deeply integrated and highly intuitive graphical user interface featuring state-of-the-art design elements for real-time target visualization, system status and operation
+ Reduced complexity of highly configurable, map based operational picture
+ Dashboard providing analyzes of mission data and automatic mission reports (statistics of overflights, health status of subsystems, overall assessment of system performance and operation success)
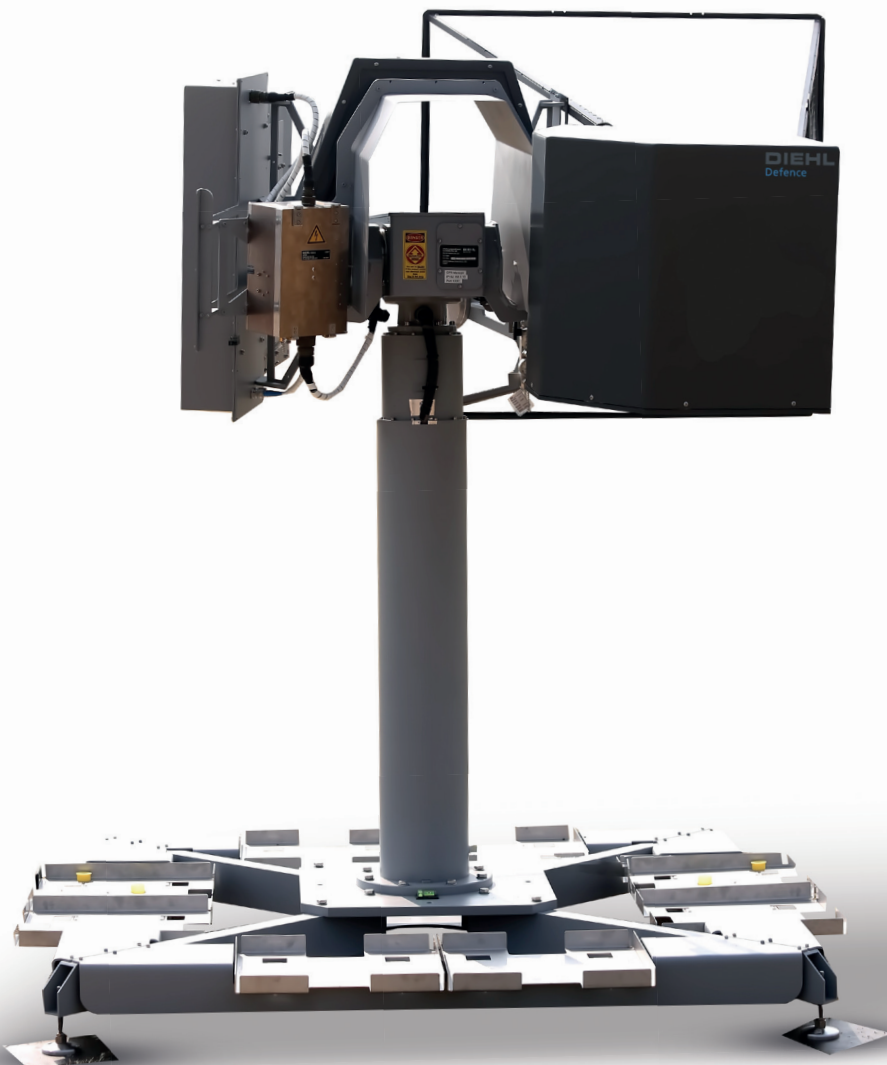
EFFECT

Effective countermeasures against unauthorized drones

In compliance with the applicable legal framework, customers can choose from a layered portfolio of measures, balancing effectiveness against all types of drones with minimal collateral damage of uninvolved third parties.

High-end integration ensures reliable security with safety in operation to keep secured premises and their airspaces drone-free wherever possible while resorting calculated risk and outcome.

Depending on the scenario of deployment and the legal preconditions for action, customers can either opt for manual intervention by a man-in-the-loop or enable fully automatic launch of countermeasures.

Smart Jamming

+ Highly effective jamming of RF control links
+ Minimal effects on other communications links
+ Selective low power approach allows omnidirectional and directed jamming

Wi-Fi Disconnect

+ Selective disconnecting control of Wi-Fi drones

GNSS Jamming

+ Effective jamming of GNSS reception
+ Prevents waypoint and return-to-home modes

Net Launcher

+ Neutralization of the drone (physical capture: net & parachute)
+ Fully automated on request

HPEM

+ Impacts directly on the semiconductors of the control electronics inside the drones
+ Counters also way-point-navigated and autonomous drones, as well as drone swarms

GUARDION SERVICE

Individually tailored consulting & future-proof product lifecycle management

+ Hardware-agnostic advice on technology, configuration and set-up

+ Risk assessment & scenario analysis (urban position vs. active airport environment, etc.) for individual customer needs

+ Harmonization of concepts with applicable legal framework and cooperative commercial drone traffic (UTM networks)

+ Full integration into existing infrastructure and complex security architecture of large-scale operations

+ Aftersales support: advanced operator training, worldwide maintenance, future-proof updates & upgrades

GUARDION USE CASES

The drone threat is versatile and so are the scenarios that require protection from aerial disruption. The GUARDION team has spent the last several years developing and testing with end users in real-life operations to ensure all subsystems in the GUARDION portfolio as well as the overall integration and connectivity work are ready for the challenges presented in:

+ Densely built urban positions
+ High-frequency cluttered areas
+ Extreme environmental conditions (maritime harbour or desert)
+ Delicate active airport environments

Our mission-proven GUARDION system has been developed on customer demand and modified to operators' needs to provide customers with solutions that are tailored to their mission.

RELIABILITY IN HIGH-PROFILE OPERATIONS

2015

G7 SUMMIT

June 2015 – Elmau

Contribution of prototypical counter-UAS system in collaboration with Germany's Federal Criminal Police Office & Bavarian Police

2016

STATE VISIT OF U.S. PRESIDENT OBAMA

April 2016 – Hannover

Contribution of counter-UAS further developed system in collaboration with Germany's Federal Criminal Police Office

2017

G20 SUMMIT

July 2017 – Hamburg

Commissioned by Germany's Federal Criminal Police Office to ensure airspace protection of event

2018

ILA BERLIN

April 2018 – Berlin

Airspace protection for Brandenburg Police

TAG DER DEUTSCHEN EINHEIT

October 2018 – Berlin

Protection of German Unification Day celebration for Berlin Police

2019

NATO „HPEX 19" (HARBOUR PROTECTION EXERCISE)

May 2019 – Lithuania

Contribution of counter-UAS system to NATO "Open Spirit" harbor protection exercise

2020

FIELD CAMP PROTECTION

July 2020

Commissioned by the German Armed Forces to deliver container-based GUARDION systems for field camp protection

GUARDION IN ACTION

GUARDION offers scalable solutions for detecting and countering drones in diverse configurations – fitting the individual requirements of customers and scenarios and providing straightforward installation and operation.

DEPLOYMENT OPTIONS:
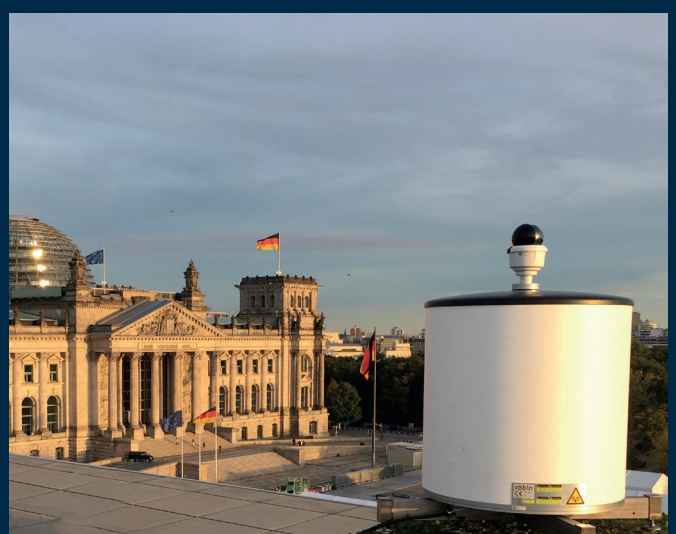

Vehicle based
Fully integrated into vehicle

Transportable
Agile version for immediate deployment

Shelterized
Fully fitted into container, ready to be temporarily stationed anywhere in the world

Stationary
Fully integrated in existing environments

> 250

GUARDION components
in action worldwide

THE GUARDION QUALITY PROMISE

Expertise of well established German high-tech companies combined in a trusted solution

DIEHL
Defence

ESG DEFENCE + PUBLIC SECURITY

ROHDE&SCHWARZ

GUARDION SOLUTION

+ Reliable protection against unauthorized drones
+ Mission-proven in multiple end-user operations
+ Flexible, tailored-to-mission integration into customizable deployment platforms

GUARDION COOPERATION

Teaming the

+ reliability of three GUARDION cooperation partners with decades of experience working closely with military and governmental customers

+ with the agile innovation of GUARDION selected suppliers such as highly-specialized tech partners

RELIABLE PROTECTION AGAINST THE THREAT OF UNAUTHORIZED DRONES

GUARDION SERVICE

+ Hardware-agnostic consulting & harmonization

+ Integration into existing infrastructure and complex security architecture

+ After-Sales Support: comprehensive operator training & worldwide maintenance

ROHDE & SCHWARZ

A cooperation of Diehl Defence, ESG and Rohde & Schwarz
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Defence

ESG DEFENCE +
PUBLIC SECURITY

ROHDE & SCHWARZ