F.A.Q. Sheet

- Real-time decoding of many drone protocols (DJI Ocusync, DJI WiFi, Mavlink, Yuneec etc.)
- Real-time AI and 3D DF frequency monitoring, including height information
- Real-time frequency monitoring (NO bands)
- Extremely high detection range of up to 50 km
- 360° full dome coverage with high tracking accuracy
- Ultra-wide frequency range (20 MHz to 8 GHz)
- Can be switched to a fully remote mode (no operator required)
- Scalable for huge sites and borders
- Locates drone swarms and drone operators
I. Performance

AARTOS™ DDS F.A.Q.

How large is the system’s detection range?
The AARTOS™ Drone Detection System features a virtually unlimited detection range, equal to (or larger than) the maximum distance between the operator and the drone (depending on the transmission power of the drone and/or its operator). The latest AARTOS™ DDS V6 can handle a DJI Phantom 4 FCC drone from a range of 50 km or more. The specific range depends on factors such as drone type and topography.

How quickly can a drone be detected?
Detecting a drone may take the system between 10 μs to 500 ms, depending on factors such as the complexity of the specific AARTOS™ system in use, the number of IsoLOG® 3D DF antenna arrays, etc.

In general, a drone can be detected as soon as its operator establishes a radio link (i.e. the drone and/or the remote control are switched on). The process of pairing, radio linking, then take-off and climb usually takes between 30 seconds and five minutes, depending on the drone model (our reference being the DJI Mavic Pro). This allows the AARTOS™ DDS unique early-warning capabilities by detecting the drone even before it takes off. Optical, acoustic or radar-based drone detection solutions do not have the ability to perform this kind of early-warning detection.

Can the AARTOS™ DDS locate the drone operator?
Yes, the AARTOS™ DDS can locate the drone operator, and can track the operator’s movements even if drone and operator are operating at different frequencies or bands.

What detection mechanisms are being used?
The AARTOS™ DDS uses real-time RF signal detection plus a combination of AI-based smart pattern triggers and neural network scans.

Can the system detect the altitude of the drone as well?
Absolutely – this is a unique feature of the AARTOS™ DDS! With two or more antennas, the DDS can detect the drone’s altitude; a single system will already show the azimuth.

Is it possible to measure the distance to the drone?
Yes, only two systems are needed to accurately measure the distance of the drone – most competing drone detection systems require at least three antennas for this. For best results, however, we recommend using three or more systems.

What does “ALL-BAND MONITORING” mean?
Traditional RF-based drone detection solutions only monitor specific bands (e.g. WiFi 2.4/5.8GHz or ISM 433/868MHz) because this is where most commercial drones have operated in the past, however, the threat landscape is changing. The latest commercial and custom drones can connect at any (mostly illegal) frequencies. Driving us to develop our unique, all-band-monitoring, receiver and ultra-wide-band tracking antenna.
The AARTOS™ DDS is able to monitor the entire frequency spectrum (e.g. 100MHz - 6GHz) hundreds of times per second. Whatever frequency the drone operator might use, we will be able to detect and track it. A completely unique feature on the current market.

What kind of coverage does the system provide?
The system’s 3D DF antenna provides 360° dome coverage (360° azimuth and full 90° elevation). This feature is unique on the market, and can be adjusted to specific needs as needed.
I. Performance
AARTOS™ DDS F.A.Q.

Does the AARTOS™ DDS depend on a line of sight?
Although the fastest detection is reached within line of sight, the system does not require it. The AARTOS™ DDS relies on RF signals, which by their nature can be traced regardless of obstructions like buildings, trees, or people. If the signal is strong enough, the system’s detection range is virtually unlimited.

Are there limitations to the detection and tracking altitude and/or elevation with respect to the sensor(s)?
Since the system can be equipped with an unlimited number of sensors forming a network covering larger and larger areas, there are no inherent limitations in terms of altitude or elevation. All systems can be linked to a single monitoring center with remote-control capabilities for each individual system. Each single system covers a radius of 360°, including the airspace above the sensor (i.e. 360° dome coverage).

If a drone’s frequency range is unknown – how does the AARTOS™ DDS detect it?
The latest AARTOS™ X3, X5 and X7 systems offer an extremely fast scan mode with a sweep speed above 1THz/s. Allowing the system to monitor its complete frequency range (e.g. 100MHz - 6GHz) hundreds of times per second. The AARTOS™ X9 system offers an even faster sweep reaching up to 48THz/s, by stitching multiple receivers together.

Does the AARTOS™ DDS support 24/7 surveillance?
Yes, the AARTOS™ DDS has a 24/7 recording mode. The system is able to continuously monitor and record the entire real-time spectrum, as long as there is enough internal/external storage space (HDD/SSD). In the context of a criminal investigation, this information would serve as valuable evidence.

Can the AARTOS™ DDS be switched to an event-recording mode?
Yes, the AARTOS™ DDS can be set to its SmartEvent Recording Mode, which automatically filters out and deletes useless data to minimize the amount written to the internal/external storage devices (HDD/SSD).

Can the AARTOS™ DDS detect 3G, 4G or even 5G Drones?
Yes, the latest AARTOS™ DDS can detect any flying RF transmitter at any frequency - even flying cellphones!

Can the AARTOS™ DDS be disguised or camouflaged?
Yes, in fact the system can be covered very easily without impacting its detection capabilities. The antenna can be covered with any material, such as camouflag netting, as long as the material is RF non-reflective (not made of metal).

When mounted on a vehicle, the AARTOS™ DDS can hardly be distinguished from a common TV or satellite antenna. This is yet another advantage of the AARTOS™ DDS system over optical, acoustic or radar-based drone detection systems.
I. Performance

AARTOS™ DDS F.A.Q.

Could the performance of the AARTOS™ DDS be negatively affected by other RF radiation (urban environment, WiFi, Bluetooth, etc.)?

No, additional RF radiation does not influence the system at all.

Does the AARTOS™ DDS work at night?

Yes, the AARTOS™ DDS works around the clock, day and night. The availability of daylight is not a limiting factor to the system.

Is the performance of the AARTOS™ DDS limited to certain weather conditions?

No, the AARTOS™ DDS is entirely weather-proof and impervious to fog, rain, snow, etc. It was designed and tested to be operated under the harshest conditions.
II. Triggers and Identification

AARTOS™ DDS F.A.Q.

Can the AARTOS™ DDS distinguish a drone signal from common WiFi or other RF signals?
Yes, our system uses intelligent AI-based pattern classification, enabling it to distinguish precisely between signal types.

How does the AARTOS™ DDS distinguish between different drone models or signals?
We use a sophisticated method that begins with recording drone emission patterns. These patterns are saved in our Smart Trigger Pattern Database (STPD), which is constantly being maintained and expanded (optional upgrades are available via service contracts). For professional use, users can also add their own custom pattern recordings to their database through the system’s teach-in function.

Is it possible to prevent friendly drones from triggering the alarm?
Yes, the system is adaptable. You can use the teach-in function to “teach” the AARTOS™ DDS which drones are friendly, allowing it to distinguish friendly drones from actual threats (black- and whitelist).

Could commercial planes, birds or other airborne objects cause the system to trigger a false alarm?
Absolutely not! The AARTOS™ DDS has been specifically designed to distinguish, on a sophisticated level, between drones and other airborne objects, minimizing the likelihood of false alarms.

When the AARTOS™ DDS detects a drone and triggers an alarm, can it provide any information on the location of the drone or the operator? How accurate is this information?
The AARTOS™ DDS can detect both drones and operators. However, the extent and accuracy of this information depends on the number of systems and antennas in use. A single AARTOS™ DDS can provide the direction and azimuth for a drone signal. Its accuracy depends on the type of IsoLOG® used; our IsoLOG® 3D DF 160 antenna offers up to 1° sector accuracy, meeting ITU class A – the highest class. As with all antennas, accuracy also depends on its specific environment (height, reflecting objects, etc.). Increasing the number of IsoLOG® antennas can improve the accuracy of the system as well. If two or more antennas are being operated, signal triangulation can be used. This enables users to locate the exact position and altitude of the drone and/or its operator. A single antenna can only register the direction and azimuth of the signal.

Is the system able to detect several drones at once?
Yes, the system can detect multiple drones or drone swarms at once – regardless of brand, type frequency/frequencies or direction.
III. Countermeasure Solutions

Do you have any products that can prevent a drone from entering a facility’s airspace?
Yes, we offer various so-called countermeasure solutions (CMS), such as jammers, to keep drones out of a restricted airspace. Both stationary and mobile solutions are available such as our mobile handheld jammer and automatic stationary sector jammers.

Are the countermeasure solutions integrated into the main system?
Yes, the stationary CMS can be integrated seamlessly into the AARTOS™ DDS system. Since the mobile handheld CMS is entirely manual, it is not available as an integrated solution.

Does the stationary CMS require an operator to be present?
Once set up correctly, a stationary CMS does not require an operator. All our stationary CMS can be controlled manually, semi-automatically or in fully-automated mode – tailored specifically to users’ needs.

Once detected, how long does it take to disable a drone?
From the time a drone has been spotted by the AARTOS™ DDS, it takes between 1-2 seconds to block the control signal and video link. These figures apply to the stationary and the mobile CMS versions as well.

What is the shutdown range of the countermeasure solutions?
Depending on the specific model, the stationary CMS has a range of up to 12 km (7 miles). The mobile CMS has a shutdown range of 1-2 km (1 mile), while still being able to block the systems of targets further away.
IV. Installation and Infrastructure

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Does the AARTOS™ DDS have any infrastructure requirements?
Specific requirements depend on the system. Our portable systems are powered by an independent battery while our other systems require an external power supply. Systems that rely on multiple remote units need a power supply as well as Ethernet cable connections. We also offer versions that are GSM-based, which use 24GHz airFiber links or satellite link-ups, and do not require an Ethernet cable connection.

Provided that power, equipment, and crew are already on-site, how long would it take to set up an AARTOS™ system?
Our mobile AARTOS™ DDS X3 can be ready to use within 30 seconds. Our bigger systems (the X5, X7 and X9), a trained crew of two people can set up a single system in about 3 to 5 minutes.

How long are the expected downtimes for software upgrades?
Software upgrades (e.g. for the drone database, new software features, and device firmware) generally take around 10 to 20 minutes. The system does not require any further downtime.

Does the AARTOS™ DDS always need to be manned?
No, in fact, once the initial setup is completed, the system can work fully automated. DDS operation can also be switched at any time to semi-automated or completely manual mode.

Is it possible to integrate the AARTOS™ DDS into existing surveillance systems?
Yes, the AARTOS™ DDS system includes an application programming interface (API), allowing the user to integrate it into any existing surveillance software and hardware systems.

How long does it take to train a new system operator?
The training necessary to operate the AARTOS™ DDS can be completed within a few days at our training campus in Germany. Please contact mail@aaronia.de for further details regarding our training.

Is there a recommendation at which height the antennas should be installed for best results?
The antenna should be installed at a minimum height of 3 meters above the ground. The general rule of thumb is: the higher the antenna, the more accurate the results and the longer the range.
Can the AARTOS™ DDS be protected against lightning?
Yes, a standard lightning rod can be installed and does not influence the AARTOS™ Drone Detection System’s performance.

In terms of mobile use, is the AARTOS™ DDS limited to certain vehicle types?
Not at all. Thanks to its durability, the AARTOS™ DDS can be mounted on many types of mobile vehicles: it can be installed on cars, trucks, vans, even on yachts. All parts of the IsoLOG® 3D DF antenna are resistant to salt water in addition to its weather and splash resistance with full IP65 certification. Coastal and marine environments do not limit the system’s performance.

Does the AARTOS™ DDS emit any radiation that may interfere with the operation of e.g. airports or communication infrastructure?
No, the AARTOS™ DDS does not emit any radiation which could interfere with such an infrastructure. The DDS is an entirely passive system.

In what temperature range can the system be used?
The IsoLOG® 3D DF antenna supports an operating temperature range of -40° C to +80° C. Our real-time spectrum analyzer (XFR V6 PRO) supports operating temperatures of -20° C to +60° C.
V. Sales, Service, Demonstrations

AARTOS™ DDS F.A.Q.

Who may need an AARTOS™ DDS?
When it comes to drone detection, the term ‘target group’ becomes ambiguous – drones pose a potential threat to commercial, public and private causes alike. Making our drone detection system beneficial to a variety of customer groups: like companies in the automotive and chemical industries, critical infrastructures such as nuclear power plants, correctional facilities, governments, and operators of airports, stadiums and concerts. Military branches and security firms benefit from drone detection on a similar level, as do private individuals seeking to protect their homes and properties.

Is the AARTOS™ DDS future-proof?
The AARTOS™ DDS is under continuous development and is consistently updated. In addition, we offer service-level agreements (SLAs) which include regular updates and maintenance of the drone database, DDS software, firmware for our analyzers, and even the IsoLOG® 3D DF antennas and receivers.

What is the typical lead time?
The typical lead time for a single AARTOS™ DDS is around 1 to 3 months, depending on the complexity of the final configuration.

What is the cost of the AARTOS™ DDS?
For all information related to the AARTOS™ DDS and its price range, please feel free to contact us at mail@aaronia.de.

Does the AARTOS™ DDS have any export regulations?
In most cases, the AARTOS™ DDS has no restrictions with regard to export or import. For further clarification, please contact us at mail@aaronia.de.

How long will you keep the system in production and provide support for it?
We provide support for a minimum of 10 years for the AARTOS™ Drone Detection Systems.

Where can I see the AARTOS™ DDS in action?
We demonstrate the AARTOS™ DDS at various international trade shows and conventions, and cooperate with partners around the globe. Should you have further inquiries regarding demonstrations, please contact us at mail@aaronia.de.

Where is the AARTOS™ DDS being manufactured?
Both the hardware and the software of the AARTOS™ Drone Detection System are being developed and manufactured in Germany, in adherence to the highest quality standards.

Examples of vehicle-mounted AARTOS™ DDS with extendable mast
Drone Detection.
In every terrain.

- Real-time ALL frequency monitoring
- Up to 16 THz/s sweep speed
- 360° gapless full-dome coverage
- Tracks 3G, 4G and 5G drones
- AI multi-target image and RF pattern recognition
- Ultra-high range of up to 50 km
- Hardware and software made in Germany