elsight

White Paper

COMPLIANCE WITH FAA REMOTE ID REGULATIONS

2022

INTRODUCTION

Thanks to the breakneck pace at which the UAS (unmanned aerial systems) industry has accelerated, the skies have become busier and drones have begun to increasingly share the same airspace as manned aviation.

We are well on our way to witnessing a fundamental societal change that will see countless commercial and civil industries and applications transformed by the enhanced convenience and efficiency of drone technology. But before this vision can completely come to fruition, extra safety precautions will be essential to ensure the seamless integration of UAVs into everyday life. Foremost among these will be the ability to easily identify the millions of new aircraft that will enter national airspace systems around the world.

Safety regulations and identification procedures for manned aircraft are numerous and well-established. However, these cannot simply be copied wholesale and applied to drones, mostly due to one fundamental difference. This is the fact that an unmanned aircraft and its pilot are located at a distance from each other, thus making accountability and law enforcement more complicated.

The remote identification, or Remote ID, concept aims to provide a solution to this dilemma that takes into account the unique needs and conditions of the commercial drone industry.

WHAT IS REMOTE ID?

Remote ID provides a standardised method for authorities to identify not only individual drones but also their pilots. This provides crucial accountability and also reduces the risk of threats to safety such as collisions with people, property and other aircraft. It will also help combat other issues arising from irresponsible or malicious drone use, such as invasions of privacy and breaches of security.

Often referred to as "digital license plates for drones," Remote ID has undergone a significant development process that took into account input from a large number of aviation committees, key players in the drone industry, and standards bodies.

The U.S. Federal Aviation Administration (FAA) has recently announced its final ruling for Remote ID requirements. Beginning September 16, 2023, all drones covered by this ruling must comply with the published regulations.

While this white paper will largely focus on the details of the FAA's implementation, it is worth noting that the UK and Europe are following suit, and similar legislation is sure to be put in place anywhere around the world where commercial and recreational drone activity is on the rise.

REMOTE ID REQUIREMENTS AND APPROACHES

Two different approaches to remote identification of UAS have been proposed: Broadcast Remote ID (also sometimes referred to as Direct Remote ID) and Network Remote ID.

Broadcast Remote ID involves the drone transmitting information that can be picked up by receivers within a limited local range. Communications are one-way only, with no specific recipient, and can be picked up by anyone with a suitable receiver.

Network Remote ID uses a third-party UAS service supplier to store and disseminate the required information, allowing drones to be tracked and monitored over greater distances.

The FAA has settled on Broadcast Remote ID for its initial implementation of the requirements. One of the downsides of the networking approach is that it requires the drone to be permanently connected to the internet via Wi-Fi or cellular connection, which can be a problem in remote areas as 4G and 5G coverage is not yet ubiquitous. Security and interoperability concerns were also cited as reasons for selecting Broadcast Remote ID instead.

ACCORDING TO THE FAA, THERE ARE THREE WAYS IN WHICH DRONE PILOTS WILL BE ABLE TO COMPLY WITH REMOTE ID REQUIREMENTS:

1. Fly a drone that has been manufactured with a built-in Remote ID broadcast capability.

These so-called Standard Remote ID UAS will be equipped with a radio-frequency broadcast capability such as Wi-Fi or Bluetooth. Messages will be receivable by a large number of personal devices, but matching of drone ID numbers to operator information will be performed only by the FAA, who can release this information to law enforcement or authorized security personnel upon request.

2. Retrofit an existing drone with an add-on Remote ID broadcast module.

The serial number of these devices must be registered with the FAA database of UAS records. Matching of serial numbers to operator information will follow the same procedures as for Standard Remote ID UAS.

3. Fly a drone at a special FAA-recognized identification area (FRIA), in which case Remote ID broadcast capability is not required.

Universities, educational institutions, and other community-based organizations will be able to apply to the FAA for official FRIA designation. Flights taking place within such areas will be limited to VLOS (visual line of sight operations) only.

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Information that must be continually broadcast by a Standard Remote ID UAV includes:

- Drone serial number or session ID. The session ID option provides an additional layer of privacy, as only the FAA or law enforcement will be able to match this ID to the drone serial number.

- Drone latitude, longitude, altitude and velocity

- Ground control station latitude, longitude and altitude

- Timestamp

- Emergency status indication

The required information for Remote ID add-on broadcast modules includes:

- Module serial number

- Drone latitude, longitude, altitude and velocity

- Latitude, longitude and altitude of the drone's takeoff point

- Timestamp

These regulations must be complied with in order to operate any drone in the National Airspace System (NAS) that weighs more than 0.55 lbs, as well as drones of any weight that undertake operations that would normally require registration. Such operations include BVLOS (beyond visual line of sight) missions and flights over people.
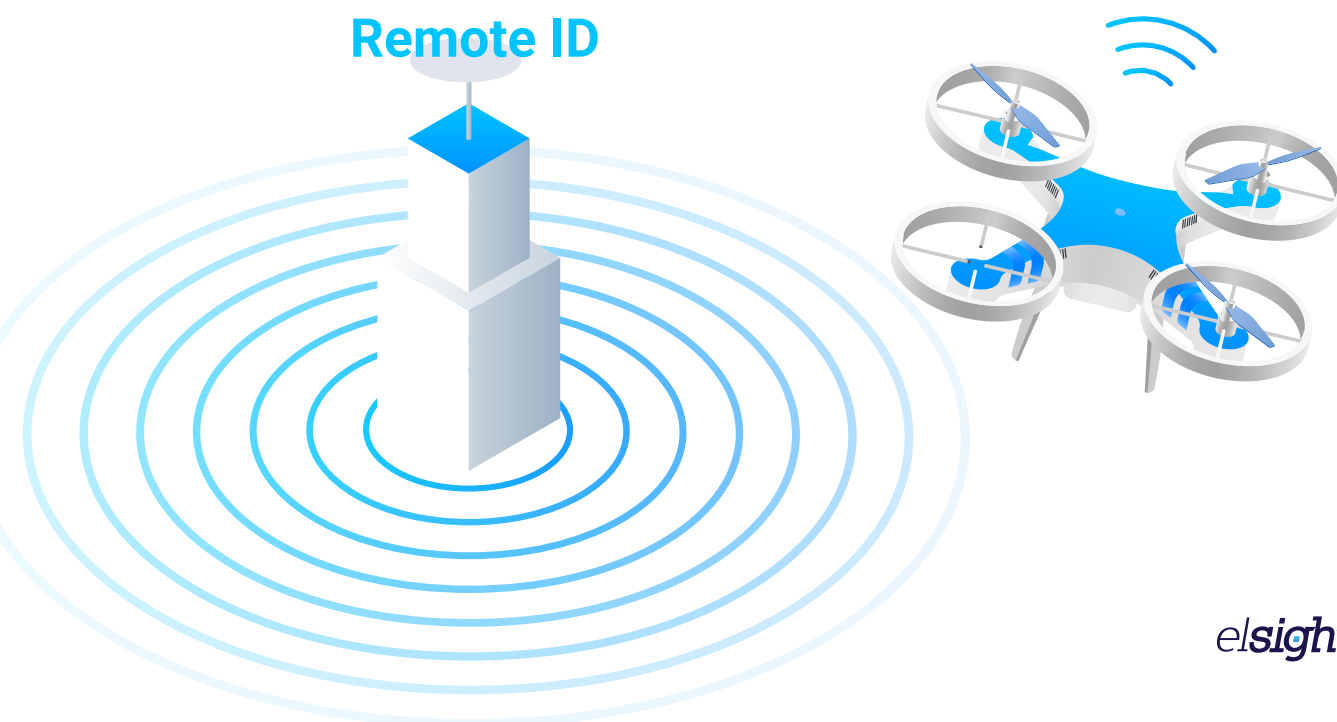
Remote ID

THE IMPORTANCE OF REMOTE ID FOR BVLOS OPERATIONS

One of the major driving forces behind the uptake of Remote ID technology was the concern from security agencies about the risks posed by unidentified drones. Now that the implementation of Remote ID has begun, this opens up the door for further support and acceptance, both from authorities and the general public, for more complex commercial operations involving BVLOS.

Remote ID will help legitimize large-scale enterprise drone programs, allowing the public to trust that operators are doing the right thing. It will also allow current laws to be enforced more effectively, and do away with the need for yet more complicated regulations to be foisted upon the drone industry.

Robust implementation of Remote ID will also help allow BVLOS operations to become more routine and repeatable. Currently, these operations can only be undertaken following a lengthy and complex waiver application process. This process is slow and often expensive, and keeps commercial drone applications from scaling up to the next level and unlocking the most profitable potential.

Remote ID will be an essential part of automating the proof of compliance required for BVLOS flights, significantly reducing the paperwork required. Target markets that will benefit from scaling up to BVLOS include package delivery, precision agriculture, industrial inspection and more.

It is worth noting that for widespread adoption of BVLOS operations, Network Remote ID implementation may be necessary, as this will allow more complex communication and co-ordination between large numbers of drones and UTM (unmanned traffic management)/U-Space services. Switzerland has already implemented the world's first functional drone Remote ID network, and the FAA has left the door open for future legislation changes that could accommodate network Remote ID.

Drone manufacturers looking to develop BVLOS-capable platforms should also take heed of Remote ID requirements in their target markets – for instance, the FAA has ruled that drones that are retrofitted with the aforementioned broadcast modules can be used for VLOS only. Manufacturers may therefore want to consider integrating Remote ID technology into their drone designs, particularly if they are looking to get type-certified. A solution that can handle both broadcast and network Remote ID requirements will be ideal if you wish to future-proof your platform design and cater to as many target markets as possible.

A FUTURE-PROOF COMMUNICATIONS SOLUTION FOR REMOTE ID AND BVLOS

As we have discussed, the future of commercial drone operations lies with Remote ID-compliant BVLOS, and this in turn is increasingly likely to require communication with a third-party service provider that can safely co-ordinate complex missions in crowded airspace, no matter where you are in the world. To provide seamless connectivity and assure legislators that you can operate with the utmost safety, a robust communications solution will be required.

Elsight's Halo provides the assurance BVLOS operators need to fly in the future commercial drone industry landscape. Featuring advanced bonding technology, it can aggregate up to four cellular channels into one single link, and can also take advantage of RF and satellite communications.

Halo ensures critical redundancy and failover, and provides the ability to automatically and dynamically balance traffic among the links most suited to the aircraft's needs even as communication environments change. The powerful platform ensures that BVLOS drones can continually provide the crucial information required to comply with any Remote ID requirements.

As even the smallest BVLOS drones will require a Remote ID implementation, the development of SWaP (size, weight and power)-optimized solutions is one of the most important priorities. Halo is highly compact, lightweight and power-efficient, adding the essential capability to your drone platform with minimal impact upon system resources.

Elsight has already begun to power the BVLOS drone industry revolution, and we can help you become a part of it. Get in touch with us to find out more!

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