FPS MOBILITY AND TRANSPORT
BELGIAN CIVIL AVIATION AUTHORITY

Training Course A1/A3

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Content table

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Glossary

Terms	Definitions
1:1 rule	Means that the remote pilot must keep the drone at a lateral distance, which cannot be less than the altitude, away from any uninvolved person. For example: if the drone flies at an altitude of 40m, the lateral distance of each person not involved must also be at least 40m.
A -	
AGL (Above Ground Level)	Refers to the altitude of a flight measured relative to the ground level (of the Earth) directly below the aircraft.
AIP (Aeronautical Information Publication)	An essential publication with detailed and comprehensive information about a country's airspace and airport infrastructure. This publication, as an official source of information, is indispensable for planning flights and knowing the regulations in force.
Airspace observer	A person who helps the pilot remotely through the airspace in which the UAS flies, visually scanning for possible dangers in the air without help.
AMSL (Above Mean Sea Level)	Refers to the altitude of a flight measured relative to the mean sea level immediately below the aircraft.
Assembly of people	A gathering where so many people are present that it is not possible for an individual to get out of the way and limit the consequences of an uncontrolled unmanned aerial vehicle. Examples include sports, cultural, religious or political events, beaches or parks on a sunny day, commercial streets during the opening hours of the shops and ski resorts/slopes.
Automatic flight operation	Mode of operation of an unmanned aircraft in which the aircraft follows pre-programmed instructions, while the pilot can intervene remotely if necessary.

Autonomous flight operations	A flight operation in which an unmanned aircraft is operated without the pilot's ability to intervene remotely.
B -	
BVLOS (Beyond Visual Line Of Sight operation)	Type of UAS flight operation in which the remote pilot is unable to maintain continuous visual contact. BVLOS is prohibited in the Category OPEN. In the opposite situation, we are talking about VLOS (Visual Line Of Sight).
C -	
C2 link = Command & Control	The data link between the unmanned aircraft and the CMU for the purpose of managing the flight.
C3 link = Command, Control and Communication link	Extends the concept of 'C2 link' to include communication with other systems or networks, such as management centers or third-party entities. This service can be used not only to control the UAS, but also to exchange additional information for complex or coordinated operations.
Category CERTIFIED	The category of UAS operations as defined in Article 6 of Implementing Regulation (EU) 2019/947.
Category OPEN	The category of UAS operations as defined in Article 4 of Implementing Regulation (EU) 2019/947
Category SPECIFIC	The category of UAS operations as defined in Article 5 of Implementing Regulation (EU) 2019/947
CE marking	A marking by which the manufacturer indicates that the product is in conformity with all applicable requirements of the Union harmonization legislation providing for its affixing.
Command unit (CU)	The equipment or equipment system to remotely operate unmanned aircraft, as defined in point (32) of Article 3 of Regulation (EU) 2018/1139, which supports the control or supervision of the unmanned aircraft during the phase of flight, with the exception of the infrastructure supporting the command and control ('C2') service.
Contingency Area	The projection of the contingency volume on the Earth's surface.

Contingency volume	The volume of airspace outside the flight geography in which contingency procedures are applied.
Controlled ground area	The area on the land where the UAS is operated and within which the UAS operator can ensure that only involved persons are present.
Cross-border operations	Refers to drone operations carried out in a Member State other than the one in which the UAS operator is registered, in accordance with EASA Regulation (EU) 2019/947
Cx label (= class identification label)	Indication that the drone meets the technical requirements set out in Regulation (EU) 2019/945. By adding a Cx label (C0, C1, C2, C3, C4,...) to the drone, the manufacturer declares that the drone is conform the respective technical requirements.
D -	
Dangerous goods	Articles or substances which, in the event of an incident or accident, may pose a danger to health, safety, property or the environment and which are carried as cargo by the unmanned aircraft, in particular: a) Explosives (mass explosion hazard, air pressure or shrapnel hazard, low air pressure hazard, high fire hazard, explosives, extremely insensitive explosives) b) Gases (flammable gas, non-flammable gas, toxic gas, oxygen, inhalation hazard) c) Flammable liquids (flammable liquid, flammable, fuel oil, gasoline) d) Flammable solids (flammable solids, self-igniting solids, hazardous in contact with water) e) Oxidizing agents and organic peroxides f) Toxic and infectious substances (poison, biological risk) g) Radioactive substances h) Corrosive substances
Direct Remote Identification (DRI)	A system that ensures the local transmission of information on an operated unmanned aircraft, including the marking of the unmanned aircraft, so

	that that information can be obtained without physical access to the unmanned aircraft.
E -	
EASA (European Union Aviation Safety Agency)	EASA is an agency of the European Union. It was established in 2018 and was given specific regulatory and executive tasks in the field of civil aviation safety and environmental protection.
Empty mass	The unladen mass of an aircraft is its total weight without cargo, accessories or additional equipment. It includes all the parts necessary for the flight, such as engines, propellers, electronic components, the GPS navigation system and the communication equipment, but does not include the material or cargo carried during the flight.
ERP (Emergency Response Plan)	An organized collection of guidelines and procedures designed to guide remote pilots and operations teams in effectively managing emergencies, such as technical failures, adverse weather conditions, and other unforeseen occurrences.
ESC (Electronical Speed Controller)	Equipment for controlling the power supply to the motors, ensuring smooth operation in accordance with the controller and pilot controls. Each engine has its own ESC.
European Standard Scenario (EU-STS)	A type of UAS operation in the Category SPECIFIC for which a precise list of mitigation measures has been established in such a way that the competent authority can be satisfied with declarations that operators will apply the mitigation measures when operating this type of operation.
F -	
FC (Flight Controller)	Central component for processing sensor data and performing pilot control, adjusting the motors in real time to ensure the stability, navigation and proper functioning of the drone.
Flight geography	The volume(s) of airspace(s) defined in space and time in which the UAS operator intends to operate.

Flight geography area	The projection of flight geography on the earth's surface.
Fly away	Refers to a situation in which the unmanned aircraft flies away uncontrolled, without the operator being able to regain control of it. This may be due to a malfunction in the communication system, a GPS malfunction or incorrect settings of the drone, such as too high a Kp value, etc.
Follow me mode	A mode of operation of a UAS in which the unmanned aerial vehicle constantly follows the remote pilot within a predetermined radius.
FPV (First person view)	A method of controlling drones in which the pilot remotely uses glasses or a screen to see in real time what the drone's on-board camera is recording, thus providing a 'first person view'. It is important to note that, in the Category OPEN, an observer of an unmanned aerial vehicle must always maintain direct visual contact with the drone to ensure the safety of the flight operations.
FTS (Flight Termination System)	Equipment is designed to terminate a flight in a controlled manner in the event of an emergency, to prevent the unmanned aerial vehicle from entering undefined adjacent zones. This is an emergency measure, not a measure for unforeseen circumstances. The main purpose of FTS is to ensure that, if a UAS becomes uncontrollable, it does not stray from the permitted flight zone.
G -	
Geo-awareness	A function that, based on the data provided by the Member States, detects a potential infringement of airspace restrictions and warns the pilots remotely so that they can take immediate and effective measures to avoid that infringement.
Geofencing	Defined as an automatic function to restrict the access of an unmanned aircraft to airspace areas or volumes specified as geographical limitations, based on the position and navigation data of the UAS.

Geographical UAS zone (= geozone)	An area of airspace defined by the competent authorities in which UAS operations are facilitated, restricted or prohibited, to mitigate risks related to safety, privacy, protection of personal data, security or the environment arising from UAS operations.
GNSS (Global Navigation Satellite System)	Satellite positioning system used by drones integrating different constellations such as GPS/NAVSTAR, GLONASS, BEIDOU and GALILEO. It is essential for maintaining the position of the UAS and ensuring flight safety and is commonly referred to as "GPS".
GPS (Global Positioning System)	A term often used to refer to the GNSS, although it refers specifically to the American GPS/NAVSTAR satellite constellation. In fact, most UAS use multi-constellation satellite positioning systems that also include GLONASS, BEIDOU or GALILEO.
Ground Risk Buffer	A zone above the Earth's surface that encloses the operational volume and is specified to minimize the risk to third parties on the surface if the unmanned aircraft leaves the operational volume.
I -	
ICAO (International Civil Aviation Organization)	The International Civil Aviation Organization (ICAO) is a global organization that includes 193 member states of the Chicago Convention. Its main role is to facilitate international cooperation by developing, promoting and establishing standards, practices and policies to ensure the safety, regularity and harmonious development of civil aviation worldwide.
Inertial Measurement Unit (IMU)	An electronic device that measures the linear acceleration and angular velocity of the UA. The IMU is essential for the stability and control of the aircraft by providing accurate data on its orientation and movements.
K -	
Kp (Planetary K-index)	The Kp index is a scale from 0 to 9 that measures solar activity and geomagnetic disturbances. A high index increases the risk of interference with the drone's GPS, making the flight more dangerous.

L -	
Level of insurance and integrity	Refers to the required level of confidence in a system or component to ensure that it functions correctly and safely, even in the event of failure or extreme conditions. This includes: • The insurance: Confidence in the ability of the system to work according to its specifications. • The integrity: The ability of the system to detect, prevent, or respond to errors, ensuring the reliability of critical data and functions.
Lift power	Force generated by the wings or rotors of a UAS to counteract gravity and keep the aircraft in the air.
LIPO (Lithium polymer)	Indicates lithium polymer batteries used to power the electronic components of a UAS. These are commonly referred to as "LIPO batteries".
LUC (Light UAS Operator Certificate)	An operation certificate issued to a UAS operator by a competent authority as set out in Part C of Regulation 2019/947. It provides certain privileges to the holder, such as to perform their own specific risk analysis and thus to start UAS operations in category SPECIFIC without prior operational approval of the competent authority.
M -	
Model aircraft club or association	An organization legally established in a Member State for the purpose of performing leisure flights, aeronautical displays, sports activities or activities with UAS.
MTOW or MTOM (Maximum Take-Off Weight or Maximum Take-Off Mass)	Corresponds to the total permissible mass of the unmanned aircraft, including cargo, fuel and any other equipment, as specified by the manufacturer or constructor. This limit represents the maximum weight that allows the unmanned aerial vehicle to be safely operated during takeoff.

N -	
Night	The hours between the end of evening civil twilight and the beginning of morning civil twilight, as defined in Commission Implementing Regulation (EU) No 923/2012.
NOTAM (Notices to Airmen)	Is an official message distributed by the aviation authority to provide urgent and temporary information on the safety or efficiency of air operations. You can consult them in real time on the website of Skeyes, the Belgian air traffic controller.
O -	
Observer of an unmanned aircraft	A person who stands next to the remote pilot and who, through visual observation without assistance, assists the remote pilot to keep the unmanned aerial vehicle in VLOS and to perform the flight safely.
OM (Operations Manual)	Document that all UAS operators in the Category SPECIFIC must possess and be able to present during an audit. It describes the organization, operational and maintenance procedures for UAS, its performance and limitations, and the training, assessment, and maintenance programs of skills for remote pilots.
Operating volume	The combination of flight geography and contingency volume.
P -	
Payload	Any instrument, mechanism, equipment, parts, apparatus, accessories or accessories, including communication equipment, installed in or attached to the aircraft. They are not intended for use in the operation or control of the aircraft, and they do not form part of an airframe, engine or propeller.
PDRA (Pre-Defined Risk Assessment)	An operational scenario for which EASA has already carried out the risk assessment and has been published as an acceptable means of compliance (AMC) to the Article 11 (risk assessment) of Regulation (EU) 2019/947.

	The PDRA still requires an operational authorization from the competent authority However, the process will be much simplified.
Privately built UAS	A UAS that has been assembled or manufactured by the builder for his own use, with the exception of UAS that have been manufactured from a series of components that are marketed as a kit.
R -	
RC (Remote Controller)	An important part of the UAS, which allows the pilot to remotely steer the course of the drone. It is equipped with two joysticks, several buttons, and antennas for transmitting and receiving signals between the aircraft and the controller.
Remote Pilot	A natural person responsible for the safe operation of the flight of a UA by operating its flight controls, either manually or, if the UA flies automatically, by supervising its course and being able to intervene and change its course at any time.
Robustness	The property of mitigating measures resulting from a combination of the safety advantage provided by the mitigating measures and the level of assurance and integrity achieved by the safety advantage.
RPA (Remotely Piloted Aircraft) = UA	Refers to an unmanned aerial vehicle. In Europe, the term "UA" (Unmanned Aircraft) is rather used to refer to this type of aircraft. It is remotely controlled by an operator through a control station.
RPAS (Remotely Piloted Aircraft System) = UAS	Complete system consisting of a remotely piloted aircraft, its control stations and the wireless connections that enable communication between the aircraft and the pilot. In Europe, the term UAS (Unmanned Aircraft System) is usually preferred to refer to the system.
RTH (Return To Home)	It is a safety feature that allows the aircraft to automatically return to the point of departure or to a predetermined point in the event of signal loss, low battery or other critical situations. This feature ensures the safe return of the drone.

RTK (Real-Time Kinematic)	It is a satellite navigation technique that improves the accuracy of real-time positioning by using corrections transmitted by a fixed base station to achieve an accuracy of up to a few centimeters.
S -	
SORA (Specific Operations Risk Assessment)	A methodology for the classification of the risk posed by a UAS operation in the category SPECIFIC and for the identification of mitigations and of the safety objectives. It helps the operator to identify operational limitations, training objectives for the personnel essential for the operation, technical requirements for the drone and to develop the appropriate operational procedures that will be part of the operations manual.
U -	
UAS (Unmanned Aircraft System) (=drone)	An unmanned aerial vehicle and the equipment to control it remotely.
UAS-Operator	A natural or legal person who operates flights with or intends to operate flights with one or more UAS.
Uninvolved persons	Persons who do not participate in the UAS operation or who are not aware of the instructions and safety regulations of the UAS operator.
Unmanned aircraft system	Commonly referred to as a "drone" or "UAS".
Unmanned glider	An unmanned aerial vehicle carried in the air by the dynamic reaction of the air against the fixed lift surfaces, the free flight of which does not depend on an engine. It can be equipped with a motor to be used in emergencies.
V-	
VLOS (Visual Line Of Sight operation)	Refers to a type of UAS operation in which the pilot maintains continuous visual contact with the unmanned aircraft remotely and unassisted, enabling him to control the flight path of the unmanned aircraft in relation to other aircraft, people and obstacles, to avoid collisions. If, on the other hand, there is no direct visual contact, it is called a flight operation out of sight (BVLOS - Beyond Visual Line Of Sight).

VTOL (Vertical Take-Off and Landing)	It defines a vertical take-off and landing aircraft as a heavier-than-air aircraft that can perform vertical procedures using more than two lift/propulsion units.

Module 1: Air Safety

Flying a drone is not just a hobby, it is an **aviation activity**.

That means you are sharing the airspace with many other users: airplanes, helicopters, gliders, paramotors, emergency services, and sometimes even other drones. For this reason, air safety is the number one priority in every flight.

Let us look at the essential principles for air safety.

1. Manned aviation always has priority over unmanned aviation

As a remote pilot, it's important to understand that manned aircraft, such as airplanes and helicopters, always have the right of way in the sky. **This rule isn't just about courtesy; it's about safety.**

Manned aircraft carry people, may fly faster and may operate under strict air traffic control. They often can't see or avoid drones easily. That's why drone pilots must always give way and avoid interfering with manned flights.

The remote pilot is obliged to maintain a thorough visual scan of the airspace to avoid any risk of collision with manned aircraft.

It is up to the remote pilot to avoid collisions. The remote pilot needs to make an evaluation of the risk of collision and take appropriate action.

This principle, rooted in safety, is also established in regulatory standards by aviation authorities worldwide.

The yielding to manned aircraft includes the following for the remote pilot:

- **Maintain visual line of sight (VLOS)**: keep your eyes on both the drone and the manned aircraft. Do not rely solely on the drone's camera or telemetry.
- **Safely and immediately land the drone**: the top priority is to get the drone on the ground as quickly and safely as possible. This minimizes the risk of collision or interference.
- **Avoid sudden movements**: if landing is not immediately possible, move the drone away from the aircraft's path in a controlled manner, preferably downward and to the side. The drone needs to be kept in an area that is far away from the other aircraft (not less than 500m).

Respecting this hierarchy is essential to maintaining safe and efficient airspace for everyone.

2. VLOS - Visual Line Of Sight - Keep the Drone in Sight

Another important rule of air safety is to never lose sight of your drone. Flying in VLOS means the remote pilot can always & continuously see the drone without any visual aid (such as binoculars) and scan the airspace for other aircraft, people, or obstacles.

This allows the remote pilot to control the flight path of the drone in relation to other aircrafts, people and obstacles to avoid collisions.

If you cannot see your drone, you cannot guarantee safety.

VLOS range depends on the size of the UAS and the environment

a) The maximum distance of the UA from the remote pilot depends on the **size of the UAS** and on the **environmental characteristics of the area** (such as the visibility, presence of tall obstacles, etc.).

b) The remote pilot should keep the UAS at a distance such that the remote pilot is always able to clearly see it and evaluate the distance of the UAS from other obstacles.

- If the UAS operation takes place in an area where there are no obstacles and the remote pilot has unobstructed visibility up to the horizon, the UAS can be flown up to a distance such that the UAS remains clearly visible.
- If there are obstacles, the distance should be reduced such that the remote pilot is able to evaluate the relative distance of the UAS from that obstacle.
- Moreover, the UAS should be kept low enough so that it is essentially 'shielded' by the obstacle, since manned aircraft normally fly higher than obstacles.

Exception to the VLOS obligation:

In category OPEN the remote pilot may let the drone fly in **follow-me mode**, up to maximum 50 meters from the remote pilot. Follow-me mode is a mode of operation whereby the drone constantly follows the remote pilot within a predetermined radius.

BVLOS (Beyond Visual Line of Sight) flights are **forbidden** in the category OPEN.

3. Maximum altitude

In the category OPEN, the maximum height is **120 meters above ground level (AGL)**.

This means that the remote pilot may only fly the drone lower than 120 m AGL measured from the ground directly beneath the drone.

Above this limit, the risk of conflicting with manned aircraft increases. For example, helicopters and air ambulances sometimes fly low. Staying below 120 m AGL keeps drones in a safer portion of airspace.

Exception: when flying **close to a tall artificial obstacle** (such as a tower or wind turbine), and with permission from the entity responsible for it, the maximum altitude may be extended by 15 meters above the obstacle.

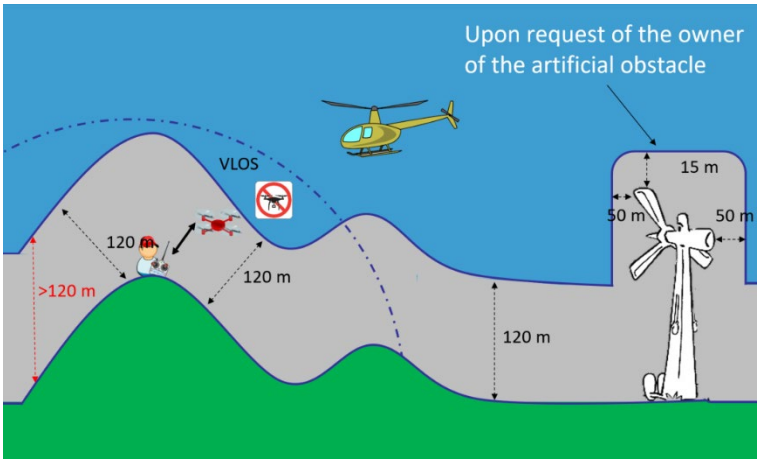


Figure 1: Regulatory reference: UAS.OPEN.010 (2) (3) Annex Part A of EU Regulation 2019/947

AGL vs AMSL

- **AGL (Above Ground Level):** the altitude measured from the surface of the ground where the drone is flying.
  Example: if you are standing in a valley, 120 m AGL means 120 m above that valley floor.
- **AMSL (Above Mean Sea Level):** the altitude measured from the average sea level. This is the reference used in aviation charts and by manned aircraft. For example, an airport might be located at 300 m AMSL, and a helicopter flying at 500 m AMSL would actually be only 200 m above the ground if the terrain is at 300 m.

For drone operations in the category OPEN, the limit of 120 m is always expressed in AGL, not AMSL.

Meters vs Feet

- In Europe, drone regulations use **meters** as the standard unit (e.g. maximum altitude 120 m AGL).
- In manned aviation, altitudes are traditionally expressed in **feet** (for example, 400 ft ≈ 120 m). This is why both units are often mentioned together.
- As a remote pilot, you should always apply the **meter values** given in EU and Belgian drone regulations, but it is useful to recognize their equivalent in feet to better understand manned aviation charts and communications.

4. Uninvolved persons

Depending on the risks of the UAS exploitation (this is the drone flight), the remote pilot may or may not fly over **uninvolved persons**.

4.1 Uninvolved person

An uninvolved person is a person that does not take part in the UAS operation, either directly or indirectly, and that could be potentially affected by the UAS operation.

When a person is not aware of the instructions and safety precautions given by the UAS operator, then this person is also considered as an uninvolved person.

4.2 Involved person

A person may be considered to be 'involved' in the UAS operation when the following conditions are met.

Before the flight, the person:

(a) has given **explicit consent** (it may be verbal) to the UAS operator or to the remote pilot to be part of the UAS operation (even indirectly as a spectator or just accepting to be overflown by the UAS); and

(b) has received from the UAS operator or from the remote pilot **clear instructions and safety precautions** to follow in case the UAS exhibits any unplanned behavior.

UAS operators are responsible for ensuring that all persons involved are able to follow in a timely manner the emergency procedures.

In principle, in order to be considered a 'person involved', one:

(a) is able to decide whether or not to participate in the UAS operation

(b) broadly understands the risks involved

(c) has reasonable safeguards during the UAS operations, introduced by the site manager and the UAS-operator; and

(d) is not restricted from taking part in the event or activity if they decide not to participate in the UAS operation.

The person involved is expected to follow the directions and safety precautions provided by the UAS operator or the remote pilot, and the UAS operator or the remote pilot should check by asking simple questions to make sure that the directions and safety precautions have been properly understood.

4.3 Examples of uninvolved persons

- People that sit at a beach or in a park, or walk on a street or on a road, are also generally considered uninvolved persons.
- Spectators or any other people gathered for sport activities or other mass public events for which the UAS operation is not the primary focus are generally considered 'uninvolved persons'.
- When filming with a drone at a large music festival or public event, it is not sufficient to inform the audience or anyone present via a public address system, or via a statement on the ticket, or in advance by email or text message. Those types of communication channels do not satisfy the points above. In order to be considered a person involved, each person should be asked for their permission and be made aware of the possible risk(s).

4.4 Overflight of uninvolved persons – safety distances

SUBCATEGORY A1 – DRONE WEIGHING LESS THAN 250 G

With a drone weighing less than 250 g, the remote pilot **may** fly over uninvolved people.

However, this **should be avoided whenever possible**, and where it is unavoidable, extreme caution should be used.

SUBCATEGORY A1 – C1 DRONE – LESS THAN 900 G

With a C1 drone, the remote pilot **may not intentionally overfly an uninvolved person**.

Before starting the UAS operation, the remote pilot should assess the area and **should reasonably expect that no uninvolved person will be overflown**. This evaluation should be made taking into account the configuration of the site of operation (e.g. the existence of roads, streets, pedestrian or bicycle paths), and the possibility to secure the site and the time of the day.

In case of an unexpected overflight, the remote pilot should reduce as much as possible the duration of the overflight, for example, by flying the UAS in such a way that the distance between the UA and the uninvolved people increases, or by positioning the UAS over a place where there are no uninvolved people.

SUBCATEGORY A2 – C2 DRONE – LESS THAN 4 KG

With a C2 drone, the remote pilot **may not overfly** an uninvolved person.

Furthermore, the remote pilot needs to keep a **safe horizontal distance of minimum 30m** from uninvolved persons (reduced to minimum 5m if the drone is flown in low-speed modus of maximum 3m per second).

Finally, the remote pilot needs to respect the **1:1 rule.** This means that the remote pilot should keep the drone at a lateral distance from any involved person that is not shorter the height at which the drone is flying.

For example, if the drone is flying at a height of 30m, the distance between the drone and any involved person should also be at least 30m.

SUBCATEGORY A3 – C3, C4 AND LEGACY & PRIVATELY BUILT DRONES BETWEEN 250G AND 25KG

The remote pilot may only fly in an area where one may reasonably expect that no uninvolved persons will be endangered.

If an uninvolved person enters the range of the UAS operation, the remote pilot should, where necessary, adjust the operation to ensure the safety of the uninvolved person and discontinue the operation if the safety of the UAS operation is not ensured.

A minimum horizontal distance from the person that is passing the area could be estimated as follows:

(1) **no less than 30 m**

(2) no less than the height (**1:1 rule'**, i.e. if the UA is flying at a height of 30 m, the distance of the UA from the uninvolved person should be at least 30 m), and

(3) no less than the **distance** that the drone would cover in **2 seconds at the maximum speed** (this assumes a reaction time of 2 seconds).

This minimum horizontal distance is intended to protect people on the ground but can be extended to property and animals.

Finally, the drone needs to stay at a **safe horizontal distance of minimum 150m from residential, commercial, industrial or recreational areas**.

Please see *Annex A* for a full overview of the UAS exploitation, remote pilot, drone and UAS operator conditions to fly in the different subcategories (A1, A2, A3) of category OPEN.

5. Assembly of people

Flying with a drone over an assembly of people is strictly prohibited in any subcategory of the category OPEN.

An assembly of people is defined in a qualitative way (not quantitively).

It is a gathering of persons whereby an individual does not have the possibility to move around and get out of the way to limit the consequences of an out-of-control drone.

Examples of assemblies of people are:

(a) sport, cultural, religious or political events

(b) beaches or parks on a sunny day

(c) commercial streets during the opening hours of the shops; and

(d) ski resorts/tracks/lanes.

6. Role of the remote pilot with regard to air safety

The remote pilot is always responsible for the safe conduct of the flight.

Air safety also depends on the remote pilot's attitude. Safe remote pilots act cautiously, respect the rules, and know their own limitations. Reckless behavior – such as ignoring weather conditions or taking unnecessary risks – is prohibited.

The remote pilot must also decide carefully when to start or stop an operation, taking into account environmental factors, the technical conditions and limitations of the UAS, and their own physical or mental state.

- For more information on the responsibilities of the remote pilot, see Module 3: Aviation Regulation.
- For more information on the human performance limitations, see Module 4: Human Performance Limitations.
- For more information on the technical conditions and limitations of the UAS, see Module 6: UAS General knowledge.

7. Awareness of the Environment

A remote pilot flying safely constantly monitors the environment for:

- Obstacles: tall trees, buildings, wind turbines, power lines, towers.
- Electromagnetic interference: sources such as high-voltage lines or telecommunication antennas can disrupt the control link.
- Animals: birds may attack drones, and farm animals may panic. Always keep your distance.
- Weather: storms, strong gusts, or freezing temperatures can reduce performance. At high altitudes (e.g., mountains), the air is thinner, meaning motors must work harder, batteries drain faster, and flight time is reduced.
- Noise: drones generate noise, which can disturb people or wildlife. Always respect any local noise restrictions or geozone conditions published on Droneguide.

Familiarization with the environment also includes evaluating whether uninvolved persons could be present in the area to be overflown and informing all involved persons of the safety measures before each flight.

8. Special flight conditions

8.1 FPV and UA Observer

FPV means First-Person View. It is a method used to control the drone with the aid of a visual system connected to the camera of the drone (goggles).

FPV is allowed in the Category OPEN, but only if an UA observer stands next to the remote pilot. The UA observer always keeps the drone in VLOS unaided (no use of binoculars) and warns the remote pilot allowing the latter to maintain the required separation between the drone and any obstacle or other air traffic.

Even in FPV, the remote pilot remains fully responsible for the flight.

8.2 Night flights

Night flights are permitted in the category OPEN if the remote pilot can keep the drone in **VLOS**. The drone needs to remain visible to the remote pilot at all times.

The UAS must also be equipped with a **green flashing light which is active and visible from the ground.** This light must be installed **underneath the drone**, not on top or on the sides.

This light is not just a formality: it improves situational awareness, prevents confusion with stars or background lights, and increases the safety margin when visibility is reduced.

8.3 Dropping

In the category OPEN the drone may not drop or spray any material, liquid or gas during the flight.

8.4 Dangerous goods

In the category OPEN dangerous goods may not be transported by drone.

8.5 Automatic vs autonomous flights

- **Automatic flights:** Pre-programmed routes are allowed, but the remote pilot must always be able to take control.
- **Autonomous flights:** These are different from automatic flights. In an autonomous flight, the drone decides and acts on its own without remote pilot input. This is forbidden in the category OPEN.

8.6 Indoor flights

The EU drone regulations do not apply to drones intended to be exclusively operated indoors.

Indoor operations are operations that occur in or into a house or a building or, more specifically, in or into a closed space such as a fuel tank, a silo, a cave or a mine where the likelihood of the drone escaping into the outside airspace is very low.

9. To recap

Air safety means flying responsibly, with full awareness of your drone, your environment, and your own limitations as a remote pilot.

- Always yield to manned aircrafts
- Keep your drone in VLOS and below 120m AGL
- Never intentionally overfly uninvolved persons
- Never fly above assemblies of people
- Respect environmental limits such as weather and interference

As a remote pilot, you are part of the aviation community.

Your responsibility is not only to your drone, but to everyone on the ground and in the air.

Module 2: Airspace restrictions

When flying a drone, it is not enough to know how to operate the controls. You must also understand the rules of the airspace in which you are flying.

Airspace is a shared environment, used by airplanes, helicopters, gliders, emergency services, and drones. To keep operations safe, authorities define airspace restrictions and geographical zones.

These rules are not optional; they are legal obligations that every remote pilot must respect.

1. Geozones and access conditions

A **geozone** is an UAS geographical zone. It is a portion of airspace established by the competent authority in accordance with Article 15 of Regulation (EU) 2019/947.

In Belgium the competent authority to establish geozones is the Belgian Civil Aviation Authority (BCAA).

In such geozones UAS operations may be facilitated, restricted or excluded in order to address risks relating to

- Safety
- Security
- Privacy & protection of personal data
- The environment

Examples of geozones created for safety purposes are geozones around airports, airfields and heliports to prevent collisions with manned aircraft.

Examples of geozones created for security purposes are those protecting prisons, governmental buildings, military areas or nuclear facilities.

The access conditions to a geozone may differ from geozone to geozone.
A geozone may

a) prohibit certain or all UAS operations
b) request specific conditions for certain or all UAS operations
c) require prior flight authorization for certain or all UAS operations
d) subject UAS operations to specified environmental standards
e) allow access to certain UAS classes only
f) allow access only to UAS equipped with certain technical features, in particular remote identification systems or geo awareness systems.

Geozone access conditions always apply **in addition to the general rules** of the UAS operation category (OPEN A1, A2, or A3, SPECIFIC).

If the flight takes place in a location that falls within multiple geozones, **all access conditions apply cumulatively, and, where relevant, the most restrictive conditions apply**.

3. Types of geozones

In Belgium, two types of geozones exist:

- **Fixed geozones** are defined in the Ministerial Decree of 20 December 2020 establishing fixed geographical UAS zones and access conditions for fixed Geographical UAS Zones

  The categories of fixed geozones are

  - Military zones
    - Uncontrolled military airfields
    - Military Controlled Traffic Region (CTR)
    - Military Terminal Maneuvering Area (TMA) and Control Area (CTA)
    - Zones for the protection of controlled military airfields outside their opening hours
    - Additional zones for the protection of certain controlled military airfields outside their opening hours
    - Military danger zones that touch the surface of land or sea
    - Military danger zones with a height of more than 400 feet AGL
    - Military helistrips and heliports
    - Military Helicopter Training Area (HTA)
    - Military Low Flying Area (LFA)
    - Military restricted areas solely for an explosive ordnance disposal center
    - Other military restricted areas
    - Military Temporary Reserved Airspace (TRA) and Temporary Segregated Airspace (TSA)
    - Military domains
  - Uncontrolled Civil Aerodromes
  - Civil Heliports
  - Civil Model Aircraft Airfields

- Civil Sites for Paramotors and Hot Air Balloons
- Seaports
- UAS Test Zones
- Penitentiary institutions
- Nuclear installations
- Royal Domains
- Civil Controlled Traffic Region (CTR)
- Civil Terminal Maneuvering Area (TMA) and Controlled Area (CTA)
- Radio Mandatory Zone (RMZ) and Transponder Mandatory Zone (TMZ) (Airport Kortrijk-Wevelgem)
- Zone for the protection of certain public institutions located in Brussels-Capital Region

- **Temporary zones**, which can be created for a limited period. These are often linked to specific events such as a cultural or royal ceremony, a large festival, a political demonstration, or an emergency response like a forest fire where helicopters are in use. Temporary zones are less foreseeable. Therefore, Droneguide must always be checked before flight.

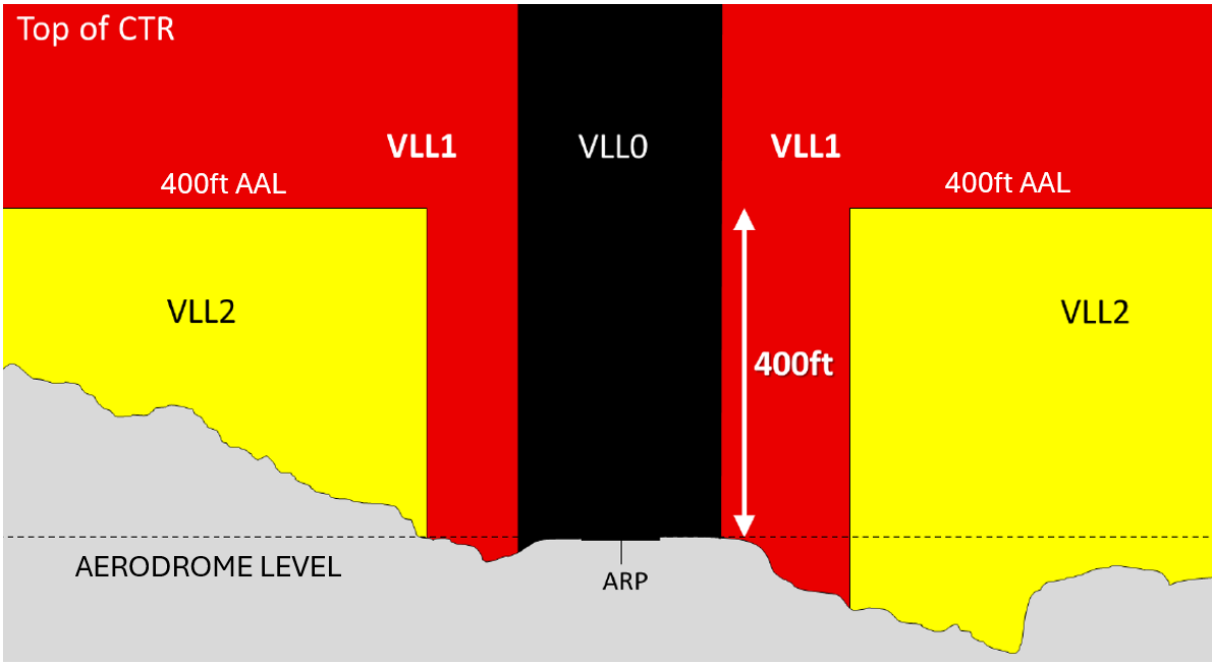
Some geozones are permanently active (24/7) and others operate according to fixed or flexible schedules. It is therefore essential to check prior to your flight which geozones are active and what the access conditions are of those active geozones.

4. Specific case: Civil Controlled Traffic Region (CTR) geozone

Airports represent some of the most sensitive areas with regard to the safety of manned aircraft.

At the Belgian airports of Brussels, Antwerp, Ostend, Charleroi and Liège, geozones have been created which coincide with the CTR. This CTR geozone is divided into **Very Low Level (VLL) areas**, each with specific access conditions:

- **VLL0** covers the runway itself and its immediate surroundings.
- **VLL1 (including VLL1A and VLL1B)** covers areas close to airport facilities.
- **VLL2** covers areas further away from the runway.



A more precise delimitation of the respective VLL area can be found under the paragraphs VLL 0, VLL 1 and VLL2 below.

When you enter the location where you want to fly with your drone in Droneguide, it will indicate in which VLL zone the flight is located and what the access conditions are for this VLL zone.

VLL0

Area

The geographical UAS zone VLL 0 consists of one or more rectangles with lateral limits defined as follows:

- On one side, the length of the respective runways extended by three kilometers from the thresholds
- On the other side, a width of two kilometers centered on the runway's central axis.

The height of the VLL 0 zone extends from ground level up to the maximum height of the respective CTR as published in the AIP Belgium-Luxembourg.

Activity period

This zone is **permanently active**.

Access conditions for UAS operations in the category OPEN

In this zone, all UAS flight operations in the category OPEN are **prohibited**.

VLL1

Area

The geographical UAS zone VLL 1 includes, insofar as it lies outside the lateral and vertical limits of VLL 0:
1° A cylinder with a radius of 4,500 meters or more if deemed necessary for aviation safety, centered on the ARP or another point approved by the Director-General, extending from ground level up to 400 feet AAL;
2° One or more rectangles with lateral limits defined as follows:

- On one side, the length of the runways extended by 8,500 meters from the thresholds (or another distance approved by the Director-General)
- On the other side, a width of three kilometers centered on the runway's central axis, extending from ground level up to 400 feet AAL.

3° A zone with the lateral limits of the relevant CTR as described in the AIP Belgium-Luxembourg, extending from 400 feet AAL up to the maximum height of the CTR as published in the AIP Belgium-Luxembourg.

Activity period

This zone is active during the times described for the relevant CTR in the AIP Belgium-Luxembourg or according to NOTAM.

If the respective VLL1 is active, the area will be filled up in orange on Droneguide.

Access conditions

Access to this zone for UAS flights in the category OPEN is subject to the following cumulative conditions:

1. UAS flights in the category OPEN may **not** be conducted **above 150 feet AGL** and never above the highest obstacle within a 100-meter radius unless explicitly authorized by air traffic control
2. Possession of a prior flight authorization from SPACC and the geozone manager.
    a. This flight authorization can be obtained via the *DAA planner* (link: https://www.skeyes.be/en/services/drone-home-page/you-and-your-drone/drone-service-application/)

   b. To know how much time in advance you need to introduce this request in the DAA planner, please check Droneguide.

3. Notification at the start and end of each flight

   a. This notification needs to be performed in *DAA Fly* (link: https://www.skeyes.be/en/services/drone-home-page/you-and-your-drone/drone-service-application/)

4. Possession of a remote identification system

   Exemption: this obligation does not apply to UAS flights in the category OPEN with

   - A UAS with C0 class identification label; or
   - A UAS with placed on the market before 1 January 2024 with MTOM below 250g; or
   - A privately built UAS with MTOM below 250g and speed below 19m/s

5. Possession of a geo-awareness system
6. The pilot must remain reachable during the flight via a mobile phone registered with the zone manager;

VLL 2

Area

The geographical UAS zone VLL 2 includes, insofar as it lies outside the lateral and vertical limits of VLL 0 and VLL 1, the lateral limits of the respective CTR as published in the AIP Belgium-Luxembourg and extends vertically from ground level up to 400 feet AAL.

Activity period

This zone is active during the times described for the respective CTR in the AIP Belgium-Luxembourg or according to NOTAM.

If the respective VLL 2 is active, the area will be filled up in orange on Droneguide.

Access conditions

Access to this zone is subject to the following cumulative conditions:

1. UAS flights in the category OPEN may not be conducted above 150 feet AGL
2. Notification of the flight at least 3 hours before the start of the flight

   a. This notification needs to be performed in *DAA Planner* (link: https://www.skeyes.be/en/services/drone-home-page/you-and-your-drone/drone-service-application/)

   b. If no conditions or prohibitions are imposed by air traffic control, the flight is considered authorized.

3. Notification at the start and end of each flight

   a. This notification needs to be performed in *DAA Fly* (link: https://www.skeyes.be/en/services/drone-home-page/you-and-your-drone/drone-service-application/)

4. Possession of a remote identification system

   Exemption: this obligation does not apply to UAS flights in the category OPEN with

   - A UAS with C0 class identification label; or
   - A UAS with placed on the market before 1 January 2024 with MTOM below 250g; or
   - A privately built UAS with MTOM below 250g and speed below 19m/s

5. Possession of a geo-awareness system
6. The pilot must remain reachable during the flight via a mobile phone registered with the zone manager.

6. How to verify geozones and comply with the geozone access conditions

Before every flight, it is the remote pilot's legal responsibility to check whether the operation will take place inside an active geozone. In Belgium, this information is available on Droneguide.

The **Droneguide platform (map.droneguide.be)** is the official interactive map, showing all Belgian geozones. It provides details such as altitude limits, activation periods, and access conditions.

With regard to other airspace restrictions, it is of interest to remote pilots to verify the following 2 official sources:

- The **Aeronautical Information Publication (AIP)** describes the structure of airspace and official restrictions.

Link:
https://ops.skeyes.be/html/belgocontrol_static/eaip/eAIP_Product/index.html

- **NOTAMs (Notices to Airmen)** provide short-term or temporary restrictions.

  Link: https://ops.skeyes.be/opersite/notamsummary.do?cmd=summaryToHtml

On Droneguide, geozones are **color-coded**.

Active geozones are **filled up** with a distinctive color

- **Red** indicates that this is an active geozone where UAS operations are prohibited. However, this prohibition may be waived for certain users.
- **Orange** indicates that this is an active geozone where UAS operations are subject to prior flight authorization
- **Yellow** indicates that this is an active geozone where UAS operations are subject to the fulfilment of a set of conditions.

The access conditions and the point of contact of the entity from which the waiver or authorization needs to be requested is indicated on Droneguide.

If a geozone is not yet active, but will become **active later on**, the geozone is already indicated with a **dotted line** on Droneguide (but not filled up with a color).

Whether a geozone is active or not, you always need to comply with the general rules of your UAS operation category (OPEN A1, A2, A3, SPECIFIC):

- If 1 or more geozones are active at the location where you want to fly, you need to comply with the access conditions of the respective active geozones(s) **AND** with the general rules of your UAS operation category
- If there is no active geozone, then only the general rules of your UAS operation category apply.

7. Geo-awareness and Responsibility

Drones may include a **geo-awareness** system that alerts you prior to entering a geozone. Some drones also have **geofencing**, which prevents entry altogether.

However, the law is clear: these tools do not replace the remote pilot's responsibility.

The UAS operator must ensure that the geozone data is updated. The remote pilot must comply with the geozone access conditions during flight. If you fly into a restricted area because your drone did not stop you, this is not an excuse, you remain fully responsible.

8. Penalties

Violating geozone access conditions is not a minor issue, as it may entail safety and security risks.

Flying in a restricted geozone without respecting the rules can result in:

- Administrative fines
- Legal sanctions
- In serious cases, criminal liability.

Compliance with geozone access conditions is a legal duty, not a recommendation.

9. U-Space – the Future

The U-Space concept is a European initiative to create a digital system for drone traffic management. It will allow safe integration of many drones into shared airspace through digitalization and automation.

U-Space is not yet active in Belgium, but it is expected to play a major role in the future, especially for advanced and commercial drone operations.

10. To recap

Respecting airspace restrictions are fundamental for safe drone operations:

- Always check Droneguide before each flight.
- Respect the access conditions of fixed and temporary geozones.
- Keep geo-awareness systems updated, but remember the remote pilot remains responsible.

By respecting these restrictions, you protect people on the ground, avoid conflicts with manned aviation, and ensure that drones remain a safe and accepted part of modern airspace.

Module 3: Aviation Regulation

Drone operations in Europe are not only about technical skills – they are above all about **safety**. Safety has been laid down in aviation regulation and **compliance with the aviation regulation is therefore crucial.**

Drones are aircrafts and thus part of civil aviation. This entails that every remote pilot and UAS operator must respect international, European, and national aviation regulations. Let us explore the main institutions, the regulatory framework, and the categories of drone operations.

1. Authorities responsible for civil aviation safety

1.1 ICAO – International Civil Aviation Organization

The **International Civil Aviation Organization (ICAO)** is the global body that coordinates civil aviation. It was created in 1944 with the **Chicago Convention**, which entered into force in 1947. ICAO develops standards and recommended practices that all member states apply to ensure international harmonization of aviation.

For drones, ICAO sets the global framework, but the detailed rules are developed at the European and national levels.

1.2 EASA – European Union Aviation Safety Agency

The **European Union Aviation Safety Agency (EASA)** is responsible for aviation safety across 32 European countries, including EU Member States plus Norway, Iceland, Switzerland, and Liechtenstein.

The European Commission developed **binding regulations** (hard law), such as:

- **Commission Implementing Regulation (EU) 2019/947**: defines the rules for drone operations, including the categories OPEN, SPECIFIC, and CERTIFIED.
- **Commission Delegated Regulation (EU) 2019/945**: sets out product requirements and technical standards for drones, including UAS-classes (C0 to C6).

EASA publishes **AMC (Acceptable Means of Compliance)** and **GM (Guidance Material)**, which helps in the interpretation of the legislation.

1.3 BCAA – Belgian Civil Aviation Authority (BCAA)

At national level, the **Belgian Civil Aviation Authority (BCAA / DGTA / DGLV)** is the competent authority for civil aviation. The BCAA:

- Implements European aviation regulations in Belgium
- Defines and enforces national requirements
- Publishes geozones on the Droneguide platform
- Is the competent authority for UAS operator registration, remote pilot certificates, exploitation authorizations, recognition of UAS training entities, audits, inspections and drone enforcement

The BCAA also works with:

- **Skeyes**, which manages civil controlled airspace and is responsible for the development of Droneguide
- **BIPT**, which regulates radio frequencies used by drones
- **AAIU**, the Air Accident Investigation Unit, which investigates drone accidents and incidents

2. Categories of Operations

UAS operations are divided into categories based on risk. The higher the risk, the stricter the requirements.

2.1 Category OPEN (low risk)

The **category OPEN** is for low-risk operations. It has three **subcategories,** based on the operational limitations, the requirements for the remote pilot and the technical requirements for the UAS:

Subcategory A1	Fly over people under certain conditions, but not over assemblies of people
Subcategory A2	Fly close to people (with distance requirements)
Subcategory A3	Fly far from people and populated areas

The key principles to fly in category OPEN are:

- **No flying over an assembly of people**
- Maximum altitude: **120 m AGL**
- Only **VLOS** flights - BVLOS flights are not allowed
- No dropping of objects, liquids or gases
- No transport of dangerous goods

Each subcategory also has its own specific additional rules.

Therefore, when preparing your flight, it is essential to identify the subcategory under which your UAS operation falls. This will determine the applicable rules and the type of training required for the remote pilot.

For an overview of all rules applicable to the different subcategories in category OPEN, see *Annex A*.

2.2 Category SPECIFIC (medium risk)

If your operation does not fit in with the category OPEN (e.g., BVLOS, urban flights with heavier drones), it falls into the **category SPECIFIC**.

In this category you can only operate based on

- a **declaration of a European Standard Scenario** (EU-STS-01 or EU-STS-02): or
- an **operational authorization** from the BCAA, based on a **PDRA (pre-defined risk assessment)** or a **SORA (Specific Operations Risk Assessment)**; or
- a **Light UAS certificate** (LUC)

2.3 Category CERTIFIED (high risk)

This applies to very high-risk operations, such as transporting people by drone. Both the drone and the remote pilot require full certification, similar to manned aviation.

3. Drone Classes (C0 to C4)

Drones are classified according to **Regulation (EU) 2019/945**:

CX-class	MTOM	UAS operation subcategory
C0	<250 g	Can fly in A1, under certain conditions even over uninvolved persons. Can also fly in A3.
C1	<900 g	Can fly in A1, but not intentionally over uninvolved persons. Can also fly in A3.
C2	<4 kg	May be used in A2.
C3	<25 kg	May be operated in A3.
C4		Model aircraft. May be operated in A3.
No CX-class	**MTOM**	**UAS operation subcategory**
Privately built UAS	<250 g	Can fly in A1, under certain conditions even over uninvolved persons. Can also fly in A3.
	<25 kg	May be operated in A3.
Legacy UAS	<250 g	Can fly in A1, under certain conditions even over uninvolved persons. Can also fly in A3.
	<25 kg	May be operated in A3.

A legacy UAS is a UAS without class identification label (Cx-label), which was brought to the market before 1 January 2024.

A drone must keep its UAS class conformity during its lifetime. If it is **modified in a way that breaches compliance with the product requirements as defined in the Regulation (EU) 2019/945**, it may not be operated in the respective subcategory (A1, A2, A3) of the category OPEN.

4. UAS Operator Requirements

The UAS operator is the natural or legal person who operates or intends to operate one or more UAS. The remote pilot, on the other hand, controls the drone during the UAS operation and is responsible for the safe execution of the flight itself.

The UAS operator may be the owner of the drone and possibly also the remote pilot, but this is not always the case.
It is permitted for one person to fulfill both roles, UAS operator and remote pilot, at the same time, but the obligations remain separate.

A UAS operator can employ multiple remote pilots, and a remote pilot can work for multiple UAS operators.

Drones can be used by different UAS operators and remote pilots.

4.1 Operator Registration

It is important to note that it is the UAS operator who needs to be registered, not the drone itself.

In Belgium, UAS operators must register via **Drone Portal** if:

- The drone weighs 250 g or more, or
- The drone weighs less than 250 g but is equipped with a camera or sensor that can capture personal data.

The UAS operator receives a unique registration number, which must be displayed on every drone flown under the responsibility of the UAS operator.

If the drone has a direct remote identification (DRI) system, then the UAS operator number needs to be uploaded onto the DRI system.

4.2 UAS Operator responsibilities

The UAS operator shall comply with all of the following:

(1**) develop operational procedures** adapted to the type of operation and the risk involved.

- If the UAS operator is also the remote pilot, written procedures should not be necessary for UAS operations in category OPEN. The UAS operator, being also the remote pilot, may use the procedures defined in the manufacturer’s instructions
- If a UAS operator is not the remote pilot or employs more than one remote pilot, the UAS operator should:

a) develop procedures for UAS operations in order to coordinate the activities between the personnel used; and

b) establish and maintain a list of the personnel and their assigned duties.

(2) ensure that all operations effectively use and support the **efficient use of radio spectrum** in order to avoid harmful interference

(3) **designate a remote pilot** for each flight

In the category OPEN it is forbidden to hand the control of the UA over to another command unit during the flight

(4) ensure that remote pilots and all other personnel performing a task in support of the operations are **familiar with manufacturer's instructions** provided by the manufacturer of the UAS, and:

(a) **have appropriate competency in the subcategory of the intended UAS operations** (category OPEN A1, A2 or A3) to perform their tasks or, for personnel other than the remote pilot, have completed an on-the-job-training course developed by the operator

(b) **are fully familiar with the UAS operator's procedures**

(c) **are provided with the information** relevant to the intended UAS operation **concerning any geographical zones**, as published on **Droneguide** for Belgium

(5) **update the information into the geo-awareness system** when applicable according to the intended location of operation.

The UAS operator should download the latest version of the geographical data and make available to the remote pilot such that they can upload it onto the geo-awareness system, if such a system is available on the UA used for the operation.

For Belgium the JSON file with these geographical data can be downloaded from **Droneguide** (https://map.droneguide.be/).

(6) in the case of an operation with a UAS with class identification label (e.g. C0, C1, C2,..), ensure that:

(a) the UAS is accompanied by the corresponding EU declaration of conformity, including the reference to the appropriate UAS class and

(b) the related class identification label is affixed to the UAS.

(7) in the case of an UAS operation in subcategory A2 or A3, ensure that all involved persons present in the area of the operation have been informed of the risks and have explicitly agreed to participate.

5. Remote Pilot Requirements

The remote pilot is the person piloting/flying the drone.

5.1 Minimum age

In Belgium the minimum age to fly a drone is

In subcategory A1 & A3	14 years
In subcategory A2	16 years

The minimum age can be different in other European countries. The remote pilot should verify the minimum age in other European countries prior to flying there.

5.2 Remote Pilot Competency

To fly in the category OPEN with a UAS, the remote pilot must be familiar with the instructions provided by the manufacturer of the UAS. These instructions can be found in the UAS user manual.

In addition, depending on the subcategory of the intended flight operation, the remote pilot needs to complete the following training and/or exam:

UAS operation subcategory	Required remote pilot training and/or exam	Remote Pilot Certificate
A1 / A3	A1/A3 online eLearning and theoretical exam	A1/A3 certificate
A2	A2 theoretical exam and Declaration of practical self-training	A2 certificate

Exemption:

For a UAS with an MTOM of less than 250 grams, it is not mandatory to complete the online training to fly this type of UAS. You do need to have a good understanding of your UAS user manual. However, we recommend taking the free online training anyway, as it will provide you with a basic understanding of the regulations you must comply with.

Registration

You can register for the A1/A3 eLearning and the A1/A3 & A2 theoretical exam via **Drone Portal** (https://drones.mobilit.fgov.be/login).

The A1/A3 theoretical exam can be completed online after having followed this A1/A3 training course.

For the A2 theoretical exam, you can choose in Drone Portal at which training entity or exam location you wish to take the exam.

Validity

The A1/A3 and A2 certificates are valid for 5 years from the date of issue.

To renew, you need to follow the online training course (only for A1/A3) and successfully pass the exam again.

However, the validity date of the highest-level certificate automatically applies to all lower-level certificates.

EXAMPLE 1

You are the owner of the following certificates

- A1/A3 certificate issued on 1 January 2026 – originally valid until 31 December 2031
- A2 certificate issued on 1 May 2029 – valid until 30 April 2034.

In this case, both certificates will now expire on 30 April 2034, because the A2 certificate is the highest certificate.

This implies that you don't need to renew your A1/A3 certificate separately as long as you keep your A2 certificate current.

EXAMPLE 2

You are the owner of the following certificates

- A1/A3 certificate issued on 1 January 2026 – originally valid until 31 December 2031
- A2 certificate issued on 1 May 2026 – originally valid until 30 April 2031
- EU-STS (European Standard Scenario) certificate issued on 1 February 2028 – valid until 31 January 2033.

In this case, the 3 certificates will now expire on 31 January 2033, because the EU-STS certificate is the highest certificate.

5.3 Tasks & responsibilities

The remote pilot has tasks he/she must perform

- Prior to the UAS flight
- During the UAS flight

5.3.1 PRIOR TO THE UAS FLIGHT

Before starting an UAS operation, the remote pilot shall:

a) **verify in which subcategory** of category OPEN (A1, A2, A3) the UAS operation will be carried out and make sure that he/she has the **necessary competences and certificates** to carry out the respective UAS operation

   See Annex A for an overview of the subcategories and the respective required remote pilot certificates.

b) **obtain updated information about any geographical zone** (geozones) in which the UAS operation will take place.

   For Belgium the information about all geozones can be verified on **Droneguide** (https://map.droneguide.be/).

c) observe the **operating environment**, check the **presence of obstacles** and check the presence of any uninvolved person.

   c1) The remote pilot should observe the **operating environment** and check any **conditions** that might affect the UAS operation, such as the locations of people, property, vehicles, public roads, obstacles, aerodromes, critical infrastructure, and any other elements that may pose a risk to the safety of the UAS operation.

   c2) Familiarization with the environment and obstacles should be conducted, when possible, by **walking around the area** where the operation is intended to be performed.

   c3) It should be verified that the **weather conditions** at the time when the operation starts and those that are expected for the entire period of the operation are compatible with those defined in the manufacturer's manual.

   c4) The remote pilot **should be familiar with the operating environment** and the **light conditions** and make a reasonable effort to **identify potential sources of electromagnetic energy**, which may cause undesirable effects, such as electromagnetic interference (EMI) or physical damage to the operational equipment of the UAS.

c5) For more info on uninvolved persons, see Module 1, 4. Uninvolved persons.

d) ensure that the UAS is in a condition to safely complete the intended flight, and if applicable, check if the **direct remote identification** is **active** and **up to date**.

To keep the UAS in a safe condition to complete the intended flight, the remote pilot should

d1) update the UAS with data for the geo-awareness function if it is available on the UAS

d2) ensure that the UAS is fit to fly and complies with the instructions and limitations provided by the manufacturer, or the best practice in the case of a privately built UAS

d3) ensure that any payload carried is properly secured and installed and that it respects the limits for the mass and CG of the UA

d4) ensure that the charge of the battery of the UA is enough for the intended operation based on:

(1) the planned operation; and

(2) the need for extra energy in case of unpredictable events; and

d5) for UAS equipped with a loss-of-data-link recovery function, ensure that the recovery function allows a safe recovery of the UAS for the envisaged operation; for programmable loss-of-data-link recovery functions, the remote pilot may have to set up the parameters of this function to adapt it to the envisaged operation.

e) if the UAS is fitted with an **additional payload**, verify that its **mass does not exceed the MTOM defined by the manufacturer nor the MTOM limit of its UAS class.**

5.3.2 During the UAS flight

During the UAS flight, the remote pilot shall:

a) **not** perform duties **under the influence of psychoactive substances or alcohol or when he/she is unfit to perform his/her tasks due to injury, fatigue, medication, sickness or other causes**.

'Other causes' means any physical or mental disorder or any functional limitation of a sensory organ that would prevent the remote pilot from performing the operation safely.

- For more information on human performance, see Module 4: Human Performance Limitations.

b) keep the unmanned aircraft in **VLOS** and maintain a **thorough visual scan of the airspace** surrounding the unmanned aircraft in order to avoid any risk of collision with any manned aircraft. **The remote pilot shall discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property**.

- For more information on VLOS, see *Module 1,2. VLOS - Visual Line Of Sight - Keep the Drone in Sight*.
- For more information on the discontinuation of the UAS flight if it poses a risk to other aircrafts, see *Module 1,1. Manned aviation always has priority over unmanned aviation*.

c) comply with all **operational limitations in geozones**

- For more information on the geozones, see *Module 2: Airspace restrictions*.

d) have the ability to **maintain control** of the unmanned aircraft

d1) The remote pilot should:

- be focused on the operation of the drone, as appropriate
- not operate a drone while operating a moving vehicle; and
- operate **only one UA at a time**.

d2) If the remote pilot operates a drone from a moving ground vehicle or boat, the speed of the vehicle should be **slow** enough for the remote pilot to maintain the drone in VLOS, maintain control of the drone at all times and maintain situational awareness and orientation.

e) operate the UAS in accordance with **manufacturer's instructions** provided by the manufacturer, including any applicable limitations

f) comply with the operator's procedures when available

g) when operating at night, ensure that a green flashing light on the unmanned aircraft is activated.

- For more information on flying a drone at night, see *Module 1, 8.2 Night flights*.

h) **NOT fly close to or inside areas where an emergency response effort is ongoing** unless they have permission to do so from the responsible emergency response services.

h1) Emergency response is any action taken in response to an unexpected and dangerous event in an attempt to mitigate its impact on people, property or the environment. This includes, but is not limited to, police, civil protection, ambulance and fire brigade actions.

h2) The remote pilot may **not interfere with, or endanger, the activities of the emergency response services**.

a. In case of an emergency response, the UAS operation should be immediately discontinued

b. In particular the remote pilot and the UAS operator should take particular care

i. not to hinder possible aerial support

ii. protect the privacy rights of persons involved in the emergency event.

6. Incidents & Accidents

- An **incident** is an occurrence, other than an accident, associated with the operation of the drone which affects or could affect the safety of the operations
- A **serious incident** is an incident in circumstances that would very likely have led to an accident
- An **accident** is when someone is seriously or fatally injured, or significant damage occurs.

6.1 Obligation to report

An accident or serious incident on or above the territory of Belgium **must be immediately reported to the AAIU(Be),** the Air Accident Investigation Unit (Belgium)**.**

This must be done **by telephone** by the persons listed below who are aware that an accident or serious incident has occurred:

- the owner, remote pilot, operator, crew members of the operator of the drone involved in an accident or serious incident
- persons involved in providing air traffic control, flight information, or aeronautical services to the remote pilot
- persons involved in maintenance, design, manufacture of the drone or training of its crew
- staff members from BCAA or personnel from EASA.

The telephone numbers of AAIU(BE) are

Tel: +32 (0)2 277 44 33
Mobile: +32 (0)476 76 18 65

If AAIU is not reachable via the above numbers, BRUSSELS A.C.C. must be notified:
Tel: +32 (0)2 206 27 21
Tel: +32 (0)2 206 27 22

They will then contact the investigator on duty.

6.2 Preservation of evidence

Except in cases of urgent necessity, it is prohibited to move a drone involved in a serious incident or accident, or to remove objects or parts from it, without having obtained permission from the AAIU(Be) investigators.

7. Enforcement and Penalties

Non-compliance with UAS regulations can lead to serious repercussions. The nature and severity of penalties depend on the jurisdiction (state) in which the violation occurs. Potential sanctions may include:

- Administrative fines imposed by the relevant authority
- Suspension or revocation of the operator's registration or the remote pilot certificate
- Criminal prosecution

8. European and National Legal References

- **Commission Implementing Regulation (EU) 2019/947 of 24 May 2019**: defines the rules and procedures for operation an UAS in category OPEN, SPECIFIC, CERTIFIED, and the required competencies for remote pilots
- **Commission Delegated Regulation (EU) 2019/945 of 12 March 2019**: defines product standards and UAS classes (C0 to C4) for UAS
- **Royal Decree of 8 November 2020:** implements Commission Implementing Regulation (EU) 2019/947 of 24 May 2019 on the rules and procedures for the operation of unmanned aircraft
- **Ministerial Decree of 21 December 2020:** establishes fixed geographical UAS zones and access conditions for fixed geographical UAS zones.

9. To recap

Aviation regulations ensure that drones operate safely within the wider aviation system.

- **ICAO** provides the international framework.
- **EASA** publishes AMC & GM interpreting binding EU regulations (2019/947 and 2019/945).
- **BCAA** implements and enforces the European regulation in Belgium
- **UAS Operators** must register, mark their drones with their UAS operator number, and ensure conformity with the operational procedures.
- **Remote pilots** must be trained, certified, and respect operational rules.
- **Reporting** serious incidents and accidents is mandatory.

By respecting these regulations, remote pilots and UAS operators contribute to safer skies, protect uninvolved persons, and ensure that drones remain an accepted part of civil aviation.

Module 4: Human Performance Limitations

Flying a drone is not just about technical knowledge. The **human factor** plays a decisive role in aviation safety. Even with a perfectly functioning drone and good weather conditions, an unfit or distracted remote pilot can compromise safety. That is why the rules in Europe and Belgium emphasize **human performance limitations**. Remote pilots must always be physically and mentally capable of flying.

1. Fitness to Fly

A remote pilot is **unfit to fly** if under the influence of **alcohol, drugs, psychoactive substances, or certain medications**.

- Alcohol is strictly prohibited. In Belgium, as in manned aviation, the limit is very low: any detectable level can impair safety. Just **one glass of alcohol** can raise blood alcohol concentration by 0.20–0.25 g/L.
- The human body eliminates alcohol slowly, at about **0.15 g per liter per hour**. This means that drinking the evening before a flight can still affect your abilities the next day.
- Symptoms of intoxication include euphoria, slower reactions, reduced vision (up to 25% less), poor coordination, fatigue, slurred speech, and impaired judgment.

Conclusion: A remote pilot should not consume alcohol **at least 24 hours before a flight**.

2. Effects of Illness, Injury, and Medication

Even minor health problems can affect safe operations:

- A cold may block the ears and increase the risk of ear infection, leading to hearing loss or disorientation.
- Gastrointestinal problems can distract the remote pilot.
- Illness or injury with even a brief loss of consciousness means the remote pilot should stop flying and consult a doctor.

Medication may also impair performance. Painkillers, sedatives, or antihistamines can cause drowsiness, slower reflexes, or reduced concentration. The rule is clear: if medication affects alertness, **do not fly**.

3. Fatigue and Stress

Fatigue reduces reaction time, alertness, and decision-making. It can result from lack of sleep, long working hours, or stress. Unlike machines, humans cannot be "recharged" quickly.

- Fatigue delays responses to failures or unexpected situations.
- It also reduces **situational awareness**: the ability to perceive, understand, and anticipate what is happening around the drone.

Stress has similar effects: high stress levels can cause impulsive decisions or tunnel vision. If a remote pilot feels abnormal stress, the flight must be postponed or stopped.

Good practice: Always ensure proper rest, hydration, and mental focus before each flight. If you feel tired or stressed, **do not fly**.

4. Vision and Night Operations

The **eyes** are the most important tool of the remote pilot.

At night, the **eyes need about 30 minutes to adapt to darkness**. Remote pilots should avoid sudden exposure to bright lights such as car headlights or flashlights, which can cause temporary blindness.

Low light also reduces depth perception, making it harder to judge distances, speed, and altitude. This makes night flights more demanding.

In addition to visibility, remote pilots must also correctly evaluate three key elements during operations in low light:

- **Distance from obstacles**: trees, buildings, antennas, and power lines must always be kept at a safe margin, with extra caution at night when depth perception is degraded.
- **Speed of the UAS**: at night, high speeds increase the risk of losing control or colliding with unseen obstacles. Slower, more deliberate maneuvers are recommended.
- **Height of the UAS:** respecting the maximum altitude is essential, but remote pilots should also regularly verify height information from their instruments, as visual estimation is less reliable in darkness.

5. Situational Awareness

Situational awareness is the remote pilot's mental radar – the ability to perceive, understand, and anticipate events. It has three levels:

1. **Perception** – noticing obstacles, weather changes, or people entering the area.
2. **Understanding** – interpreting what these signs mean (for example, a person walking towards the landing zone).
3. **Anticipation** – predicting what could happen next and preparing to react.

Poor situational awareness increases the risk of collisions, intrusions into restricted airspace, or loss of control.

6. Environmental Factors

The environment influences human performance:

- **Cold weather** may make it difficult to use the controls with gloves, or cause propeller icing.
- **Strong wind or poor visibility** increases workload.
- **Electromagnetic interference** (power lines, antennas) may stress the remote pilot due to signal loss.

Assessing environmental conditions before a flight helps reduce remote pilot workload and supports better decision-making.

7. Illusions and Misjudgments

The human brain can misinterpret reality. **Optical illusions** may distort distances, colors, or the speed of the drone. Fatigue, stress, or poor lighting can increase this risk. To reduce errors:

- Rely on the UAS instruments for altitude, distance, and speed.
- Respect the operational limits of the subcategory (A1, A2, A3).
- Use obstacle detection systems if available.

8. Operational Practices

To support human performance, certain practices are recommended:

- **Wear a vest** marked "Remote pilot – do not disturb" to avoid distractions.

- Secure the **take-off and landing area** with cones or markers.
- Always conduct a **pre-flight check** using the manufacturer's manual and checklist.
- Continuously monitor your own condition during the flight, as sudden fatigue or dizziness can appear unexpectedly. Stop when you do not feel fit to fly anymore.

9. UAS Operator's Responsibilities: I'M SAFE

In aviation, safety always starts with the human at the controls. Unlike manned pilots, remote pilots of drones are not legally required to undergo a medical examination before flying. However, this does not mean health and fitness can be ignored. The responsibility lies with the UAS operator, who must ensure that medical and human performance risks are properly assessed before each flight.

A practical way to do this is by using the **"I'M SAFE" checklist**, a simple but effective self-assessment tool widely used in aviation. It helps remote pilots quickly evaluate whether they are fit to fly.

- **I**llness: Even a minor cold or headache can affect concentration, judgment, or reaction times. The remote pilot must be free from illness.
- **M**edication: Some medications, even common painkillers or cough syrups, may cause drowsiness or blurred vision. Always check the side effects before flying.
- **S**tress: Daily stress from work, family, or personal issues can significantly reduce attention and decision-making ability. Flying under stress increases risk.
- **A**lcohol & Drugs: A single drink can already impair judgment and reaction times. No flight should ever take place if alcohol or drugs have been consumed.
- **F**atigue: Tiredness is one of the most dangerous hidden risks. It slows reflexes and reduces situational awareness. If you feel fatigued, postpone the flight.
- **E**motions & Eating: Strong emotions like anger, sadness, or excitement may lead to errors or reckless behavior. Likewise, flying without having eaten properly can affect energy and focus.

This checklist is not just a recommendation; it should become a **habit before every operation**. By checking these 6 topics, a remote pilot can prevent poor decisions and increase overall flight safety.

10. The Attitude of the Remote Pilot

Flying safely is not only a matter of technical skills. It also depends on the mindset of the remote pilot. The way you approach decision-making, evaluate risks, and respect your own limitations will directly affect the safety of your operations.

A good remote pilot maintains a balanced and professional attitude:

- **Deliberate decision-making**: Take time to think before acting. Rushed or impulsive choices often lead to mistakes.
- **Self-awareness**: Know your abilities, but also your limits. Recognizing when you are reaching your limits is a sign of professionalism.
- **Humility**: Even experienced remote pilots can make errors. Accepting feedback and learning from mistakes keeps you safe.
- **Open-mindedness**: Conditions, technologies, and rules evolve. Staying receptive to new information and perspectives makes you adaptable.

On the other hand, there are attitudes that must be avoided:

- **Impulsiveness**: Acting without reflecting on the consequences is one of the fastest ways to cause an incident.
- **Overconfidence**: Thinking that nothing can go wrong often leads to ignoring rules and safety margins.
- **Low self-confidence**: Constantly doubting your own abilities may lead to hesitation and poor decision-making under pressure.

In short, the right **attitude** is just as important as technical knowledge. A remote pilot who combines skills, preparation, and the correct mindset will significantly reduce the risk of accidents.

11. Linking Human Performance to Safety Rules

All the safety requirements in the category OPEN are directly linked to human performance:

- **VLOS** (Visual Line of Sight) ensures the remote pilot can react immediately.
- **Night flight limitations** exist because vision and perception are reduced.
- **Distance rules** (30 m, 150 m, 1:1 rule) provide margins for human reaction time.
- **Alcohol and drug prohibitions** exist because impaired judgment is one of the leading causes of aviation accidents.

12. To recap

Human performance limitations are just as important as the technical limits of the drone. A safe flight requires a remote pilot who is healthy, well-rested, and not under the influence of alcohol or drugs. It also means being aware of how fatigue, stress, emotions, or medication can affect your ability to fly. Good vision and proper adaptation for night operations are essential, and situational awareness must be maintained at all times.

As remote pilot, you always have the right to say NO.

If conditions are unsafe, if you feel unfit to fly, or if the risks are too high, you must refuse the flight. This is not a weakness; it is part of your responsibility. Knowing when not to fly is a sign of professionalism and is just as important as knowing how to fly.

By respecting these principles, remote pilots in Belgium and Europe ensure compliance with the regulations. They also protect themselves, uninvolved/involved persons, and the reputation of the drone community.

Module 5: Operational procedures

Flying a drone is not just about piloting. Safe operations depend on a structured process before, during, and after every flight. Operational procedures are therefore divided into three main phases: pre-flight, in-flight, and post-flight. Each phase has specific steps that the remote pilot must follow to ensure safety, compliance, and efficiency.

1. Pre-flight procedures

1.1 Assessment of the area of operation

Before every flight, the remote pilot must carefully evaluate the area of operation and its surroundings. This evaluation of the area of operation includes the following:

- **Terrain**: Check whether the area is flat, hilly, or contains valleys. Terrain influences how you maintain visual line of sight and affect how wind behaves.
- **Obstacles**: Identify tall trees, power lines, masts, towers, wind turbines, or other types of buildings. These can interfere with your visual line of sight and can pose possible collision risks.
- **VLOS considerations**: Always maintain VLOS without obstructions as outlined above. If obstacles, terrain, or weather conditions limit visibility, adjust your flight path accordingly and make sure you remain in visual line of sight.
- **Uninvolved persons**: Always consider the risk of flying over or near people who are not involved in the operation. In category OPEN, intentional overflight of uninvolved persons is prohibited, except when operating a C0-class drone under subcategory A1. Even in the subcategory A1 with a C0, overflight should be avoided and kept to the absolute minimum.
- **Assemblies of people**: Recognize situations where people are gathered so closely that they cannot move away, such as concerts, demonstrations, or crowded beaches. Assemblies of people are generally gatherings where individuals cannot freely move due to the density of the crowd. Overflight of such assemblies is strictly forbidden in the category OPEN.
- **Critical infrastructure**: Airports, heliports, power plants, and other sensitive sites are often subject to geozone restrictions. Always verify these restrictions on Droneguide.

A thorough pre-flight assessment by the remote pilot is essential to ensure awareness of geozone conditions and compliance with the requirements of the specific subcategory of the Category OPEN in which the operation will take place. Both the UAS operator and the remote pilot share responsibility for ensuring that the flight fully complies with the applicable category requirements and any geozone restrictions.

1.2 Identification of a safe area for practice

A safe area must always be chosen for any drone operation. This is especially important during practice flights or when testing a new drone. A safe area for practice typically has:

- **Open space:** Select a field or meadow far away from houses, roads, or busy areas. For example, when you want to practice as a remote pilot, following the conditions of the A3 subcategory in a location with no active geozone is a good benchmark to choose your location for your first flights.
- **Good visibility**: always maintain an VLOS with the drone. If visibility is reduced by obstacles, terrain, or weather conditions, you must adjust your flight path immediately to restore clear sight and ensure continuous VLOS.
- **Minimal interference**: Always keep in mind that antennas or sources of electromagnetic disturbance can interfere with your drone's connection. Avoid locations where electromagnetic interference is likely, especially in urban environments where strong emissions and signal reflections occur. Examples include areas near high-voltage power lines, radio or TV broadcast towers, mobile phone masts, radar installations, and large metal structures such as bridges or industrial sites.
- **Limited risk to third parties**: Always remain alert to the possibility that uninvolved persons may unexpectedly enter your area of operations. Continuously monitor the surroundings and be prepared to take immediate action, such as hovering your drone or initiating a safe landing, if someone approaches the safety zone.
- **Emergency landing zone:** Ensure you can quickly land or abort the flight if needed. Emergency access means having a clear, obstacle-free landing zone and an immediate plan to stop operations when unexpected hazards occur. For example, if a trauma helicopter approaches at low altitude, you must immediately descend and land in a safe spot away from the helicopter's flight path. Always give full and immediate right of way to manned aircraft, your drone must clear the airspace without delay.

Training in safe areas enables a remote pilot to build confidence and develop essential skills while minimizing operational risks. These environments provide space to practice maneuvers, test emergency procedures, and become familiar with your drone's behavior without endangering people or property.

Even experienced remote pilots should select safe areas when testing new drones, firmware updates, or unfamiliar features to ensure safety and reliability before operating in more complex environments.

1.3 Environmental and weather conditions

Weather and environmental conditions directly affect the performance of your drone. The remote pilot must always keep in mind to:

- **Check the windspeed**: every drone has a specified maximum wind resistance listed in its user manual. Operating in wind conditions that exceed this limit can lead to instability and potential loss of control.
- **Consider the temperature**: cold environmental conditions reduce the efficiency of the battery, while excessive heat can lead to overheating of your drone's battery. Always check the user manual for the recommended safe operating temperature range.
- **Monitor for precipitation:** rain, snow, or fog can severely damage the electronic components of your drone and may significantly reduce visibility, increasing the risk of incidents and accidents. Most drones in the Category OPEN are not waterproof, so flying in such conditions should be strictly avoided.
- **Identify electromagnetic interference**: power lines, radar installations, or strong telecommunication antennas may disrupt GPS and control signals.
- **Obtain reliable forecasts**: Use aviation sources such as METAR (current weather observations) and TAF (24 to 36-hour forecasts), or trusted weather apps. Learn to interpret wind codes like '09010G20KT,' which means wind from 090° (east) at 10 knots, with gusts up to 20 knots.

Ignoring weather conditions is one of the most common causes of accidents. Assessing the environment before take-off is a mandatory step.

1.4 Physical inspection of the UAS

Before every flight, it is critical to perform a comprehensive pre-flight inspection of your drone and all associated equipment. This step is essential to prevent technical failures during your flight and to ensure operational safety.

A thorough inspection helps identify potential issues such as loose components, damaged propellers, low battery health, or calibration errors before they become serious risks in the air.

Those key checks should at least include the drone's structural integrity, battery condition, propeller security, sensor functionality, and controller connectivity. Always follow the manufacturer's recommendations. A consistent inspection routine helps ensure nothing is forgotten.

- **Propellers**: Inspect each propeller individually and carefully for cracks, dirt buildup, or looseness of the propeller. Even some minor damage can reduce aerodynamic efficiency of the propellors, cause vibrations, and lead to loss of lift. As a remote pilot you have the responsibility to replace any damaged or worn propellers immediately.
- **Motors**: Ensure all motors of the drone are clean, free of debris, and unobstructed. Make sure that you check whether they rotate smoothly without unusual resistance and confirm they are securely mounted to the airframe.
- **Airframe**: Examine the entire structure for cracks, deformation, or impact marks that could compromise integrity of your drone.
- **Batteries**: Check the charge level, temperature, and physical condition of each battery. Never use batteries that are swollen, leaking, or show signs of damage. Such batteries can overheat, leak, or even catch fire, posing a serious safety risk to both the drone and the operator. Physical damage or swelling indicates internal cell failure, which can lead to sudden power loss during flight and cause crashes. Always confirm they are properly seated and locked in place before flight.
- **Remote controller**: Verify the controller is fully charged and functioning correctly. Check antenna orientation for optimal signal strength, ensure joysticks move freely, and confirm stable connectivity with the drone.

Additionally, verify that all firmware is up to date (of your drone and remote controller) and that the Return-to-Home (RTH) function is properly configured before each flight.

Taking the time to complete these checks significantly reduces the likelihood of in-flight malfunctions and enhances overall mission reliability.

Before each flight, verify that your operator registration number is clearly attached and readable on all your UAS. This can be done, for example, by using a durable sticker.

1.5 Setting the parameters

Once you have completed the physical inspection of your drone, the next critical step is configuring its operational parameters to ensure a safe and compliant flight. Proper configuration minimizes risks and guarantees adherence to regulatory requirements:

- **Altitude limit**: set the maximum altitude to 120 meters AGL or lower. This complies with EASA regulations for the Category OPEN and reduces the risk of conflicts with manned aircraft.
- **Maximum distance**: configure the maximum horizontal distance so the drone always remains within VLOS. This is essential for maintaining control and situational awareness.
- **Return-to-Home (RTH)**: make sure you set the RTH altitude above the highest obstacle along your route. This ensures a safe return in case of, for example, signal loss between the drone and remote controller without violating the altitude limits of the Category OPEN
- **Geo-awareness system (when required)**: update the system with the latest geozone data (see Droneguide) to avoid restricted or prohibited areas.
- **Remote identification (when required)**: verify that the Remote ID is active and correctly configured, as required by EASA regulations.

Always be careful when adjusting advanced features in the control application. Make sure you always check the user manual to understand what exactly you are changing in the parameters. Incorrect settings can drastically alter your drone's behavior, potentially leading to unsafe situations. Always double-check configurations before takeoff.

2. In-flight procedures

2.1 Normal procedures

During flight in the Category OPEN, the remote pilot must always:

- **Maintain VLOS**: Keep the drone visible without the aid of electronic devices.
- **Monitor flight parameters**: Continuously check altitude and speed to ensure compliance with legal and technical limits.
- **Respect Safety Distances**: Maintain the required separation from uninvolved persons, vehicles, animals, and property, according to the OPEN subcategory in which you are operating.
- **Follow geozone restrictions**: Adhere to limitations displayed in Droneguide or other official sources.

Normal procedures are about discipline. Even routine flights must follow the same strict rules of the category OPEN to ensure safety and regulatory compliance.

Keep in mind for the category OPEN:

- **Do not fly over assemblies of people**: Flying over crowds or gatherings is strictly prohibited to reduce the risk of injury in case of loss of control.
- **No dropping of goods**: Dropping objects from the drone is not allowed, as it can cause harm to people, animals, or property.
- **120m AGL (400ft.)**: Always remain below 120m AGL with your drone.

2.2 Determining UA's attitude, altitude, and direction

As the remote pilot you must always maintain full awareness of the drone's orientation and position. Losing track of whether the drone is facing toward or away from the pilot can lead to dangerous control errors, especially during turns or emergency maneuvers.

Orientation techniques:

- **Observe navigation lights**: If equipped, use the color coding (e.g., green or red) to determine the drone's heading.
- **Check controller display**: Take a *brief* look at your controller to use the map or heading indicator on the ground station or remote controller.
- **Practice in safe areas**: Regularly train orientation maneuvers in open spaces to build confidence and muscle memory.

Loss of orientation or poor altitude judgment can result in collisions, loss of control, or violation of limitations of the category OPEN. Consistent awareness ensures safe and compliant operations.

2.3 Observing the airspace

The remote pilot must continuously scan the airspace for potential hazards. Situational awareness is critical for preventing collisions and ensuring safe operations.

Key hazards to watch out for:

- **Manned aircrafts**: This includes airplanes, helicopters, and emergency service aircraft but also paramotors or hot air balloons. Always give full and immediate right of way to manned aircraft. Your drone must clear the airspace without delay.
- **Other drones**: Airspace under 120m (400ft) may include other UAS. Always maintain safe separation, adjust your flight path, and if possible, coordinate via visual signals or radio.
- **Birds and wildlife**: Birds can behave unpredictably and may attack drones. Keep a safe distance and avoid areas with high bird activity.
- **Obstacles and terrain**: Continuously monitor for trees, power lines, cranes, and other structures that may not appear on maps.
- **Weather changes**: Watch out for sudden wind gusts, rain, or fog that can affect visibility and control of your drone.

Important key principle: Manned aircraft always have priority! Always give full and immediate right of way to manned aircraft.

2.4 Ensuring no danger to people or property

The remote pilot must ensure that the drone never creates a risk to individuals, animals, vehicles, or property during any part of the operation.

This responsibility begins before takeoff and continues until the drone is safely landed. Overflying uninvolved persons is generally prohibited, except where explicitly permitted, such as with C0 drones operating in the A1 subcategory. Even in these cases, exposure must be minimized and control always maintained.

The remote pilot must respect all minimum separation distances defined by the EASA regulations, keeping the drone well clear of houses, roads, and moving vehicles to prevent accidents and privacy violations.

Safety is not static; it requires constant adaptation.

The remote pilot must continuously monitor the environment and adjust the flight path whenever new hazards appear, such as people entering the operational area or vehicles approaching.

- **Before** the flight, a thorough risk assessment should identify sensitive zones like playgrounds, traffic routes, and private property, and alternative routes or emergency landing spots should be planned.
- **During** the flight, the remote pilot must remain vigilant and ready to execute an immediate descent or return-to-home procedure if control issues arise or unexpected hazards occur.

Weather conditions and visibility play a critical role in safety. Operations should be postponed with strong winds, rain, or poor visibility, as these factors increase the risk of losing control.

The reliability of equipment is equally important. Pre-flight checks must confirm that all systems, including navigation, propulsion, and battery, are functioning correctly.

Ultimately, ensuring no danger to people or property is a dynamic process that demands continuous awareness, proactive decision-making, and strict adherence to regulatory requirements.

2.5 Contingency and emergency procedures

Remote pilots must be prepared to respond effectively to unexpected events during flight. But even with extensive preparation, abnormal situations can occur.

Every remote pilot, beginner or experienced, must be ready to act upon these abnormal situations.

The following procedures briefly outline how to manage abnormal situations to maintain safety:

- **Abnormal flight path**: If your drone behaves unexpectedly or external conditions change, immediately try stabilizing the UAS. Reduce its speed, maintain VLOS, and steer toward a safe area. If necessary, initiate RTH or controlled landing.
- **Positioning failure**: Loss or degradation of the GPS or other positioning systems can lead to drift or inaccurate navigation. Switch to manual control, maintain visual reference, and avoid obstacles. If orientation becomes difficult, descend and land in a safe location.
- **Uninvolved person entering the operational area**: If an uninvolved person enters the flight zone, adjust the flight path to maintain required safety distances. If separation cannot be guaranteed, immediately climb or descend to a safe altitude and prepare for landing.
- **Exiting the planned area**: If the drone unintentionally leaves the planned area, correct the flight path promptly. Avoid that the drone starts drifting away into, for example restricted geozones or populated areas. If control is compromised, execute a RTH or emergency landing in a safe spot.
- **Manned aircraft near the area of operation**: Manned aircraft always have priority. If one is detected near the operational area, descend immediately and land as soon as possible. Never assume the aircraft can see your drone.
- **Another UAS incursion**: If another drone enters your airspace, maintain visual contact and adjust your trajectory to avoid collision. If necessary, land until the area is clear.
- **Loss of attitude or position control**: Strong wind, magnetic interference, or turbulence can cause instability of your drone. Reduce altitude, slow down, and regain control. If recovery is not possible, execute an emergency landing in a safe area.
- **Loss of C2 link**: In case of communication loss between the remote pilot and the drone, the pre-programmed failsafe procedure must activate (e.g., hover, RTH, or land). The remote pilot must monitor and ensure the drone completes the procedure safely.

Emergency and contingency procedures are not optional. They are an integral part of safe UAS operations. A remote pilot who anticipates those abnormal situations and reacts decisively protects not only the integrity of the flight but also the safety of people and property. Mastering these procedures turns unexpected events into manageable challenges.

3. Post-Flight Procedures

3.1 Maintenance

After every flight, the drone must undergo a thorough check to ensure continued airworthiness and safety for future operations.

- **Inspect the drone**: Check propellers, motors, and the airframe for cracks, deformation, or wear. Any damage must be repaired before the next flight.
- **Handle batteries safely**: Remove the battery immediately after landing and allow it to cool before recharging. Store your batteries between 15°C and 25°C on a non-flammable surface, away from heat sources. Replace those batteries that are showing signs of swelling or irregular performance.
- **Clean the drone**: Remove dirt, dust, and moisture from all surfaces, paying attention to sensors and cooling vents. Ensure your drone is completely dry before storage, especially after flying in humid or wet conditions.
- **Plan maintenance**: Schedule necessary actions such as propeller replacement, tightening screws, and firmware updates. Keeping track in a maintenance log to track component life cycles and ensure compliance is always a good idea.

Damaged or swollen batteries must never be reused. They should be safely discharged and disposed of according to local hazardous waste regulations. Continuing to use compromised batteries can lead to overheating, fire, or even explosion during charging or flight. Always inspect batteries after each flight and remove any that show signs of swelling, leakage, or physical damage.

Finally, **always refer to the user manual of your specific UAS**, because maintenance requirements can differ depending on the model of UAS you're using. Following the manufacturer's instructions ensures not only the safety of the operation but also that the drone continues to comply with UAS class requirements.

3.2 Logging of flight details

Although the category OPEN does not legally require a logbook, maintaining one is considered good aviation practice and strongly recommended.

A flight log provides a structured record of operations, helps track remote pilot experience, identifies recurring technical issues, and serves as evidence of compliance in case of audits or inspections.

A well-maintained logbook should at least include:

- **Flight identification**: Flight number, date, and time.
- **UAS details**: UAS type, UAS class, and registration number.
- **Operational data**: Take-off and landing locations, flight duration, and maximum altitude.
- **Purpose of the flight**: Training, recreational, commercial, or test operation.
- **Environmental conditions**: Weather observations, wind speed, and visibility.
- **Anomalies or incidents**: Any technical issues, loss of link, or safety occurrences.
- **Maintenance notes**: Actions taken after the flight or scheduled for later.

In addition, saving telemetry data such as waypoints, altitudes, and battery performance is highly recommended. This information enables accurate flight reconstruction, supports incident analysis, and contributes to improving future operations.

Maintaining a logbook reflects professionalism and a commitment to safety, even when it is not mandated by regulation for the category OPEN.

4. To recap

Operational procedures form the foundation of safe drone operations. Every flight begins with thorough preparation, continues with disciplined and alert remote piloting, and ends with careful post-flight checks.

By carefully preparing before take-off, staying alert and disciplined during flight, and performing proper checks afterwards, remote pilots can actively reduce risks to people, property, and the aircraft itself.

Preparation and situational awareness are as vital as technical flying skills.

A flight that starts and ends safely is never a matter of luck; it is the direct result of following these operational procedures consistently and professionally.

Module 6: UAS General knowledge

Flying a drone might seem effortless, but true safety goes far beyond take-off and landing. Every remote pilot needs a solid understanding of how his or her UAS functions, the environment it can operate in, and the systems that keep it under control.

This module provides the foundation for safe and responsible UAS operations. You'll explore the core principles of flight, technical systems, operational limitations, and essential safety procedures. This knowledge of your UAS protects not only your drone but also the people, property, and airspace around you.

1. Basic Principles of Flight

1.1 Lift and thrust

All aircraft, manned or unmanned, are subject to the same physical laws of flight. Two key forces make this flight possible: lift and thrust.

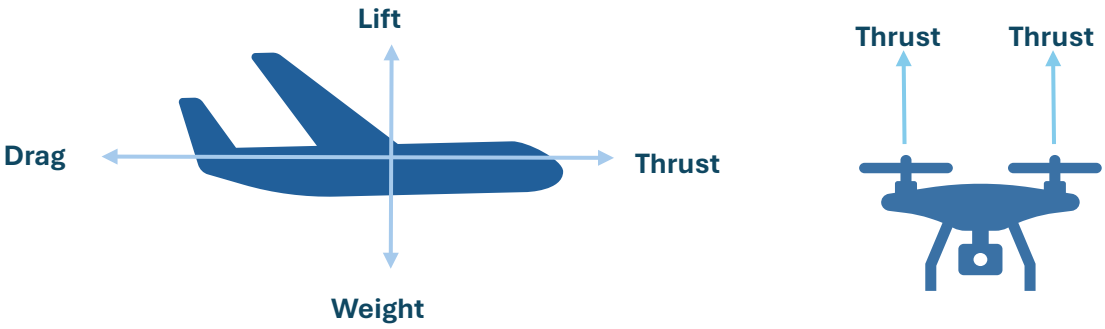


Figure 1: Lift & thrust

Lift	Thrust
Lift is the upward aerodynamic force that counteracts gravity. In fixed-wing aircraft, lift is generated by the wings. As air flows over the curved upper surface of the wing, it moves faster than the air beneath, creating a pressure difference that produces lift.	**Thrust** is the force that propels an aircraft. For multirotor drones thrust acts vertically to keep the drone airborne. High-speed spinning propellers accelerate air downward, creating an upward reaction force. Each propeller's angle, called blade pitch, and rotation speed determines how much thrust is produced

By varying the speed of individual propellers, multirotor drones achieve stability and maneuverability. This differential thrust allows the drone to pitch, roll, and yaw, enabling precise control in three dimensions.

1.2 Axes of rotation in UAS flight

A UAS moves around three principal axes, each corresponding to a specific type of rotation and control input:

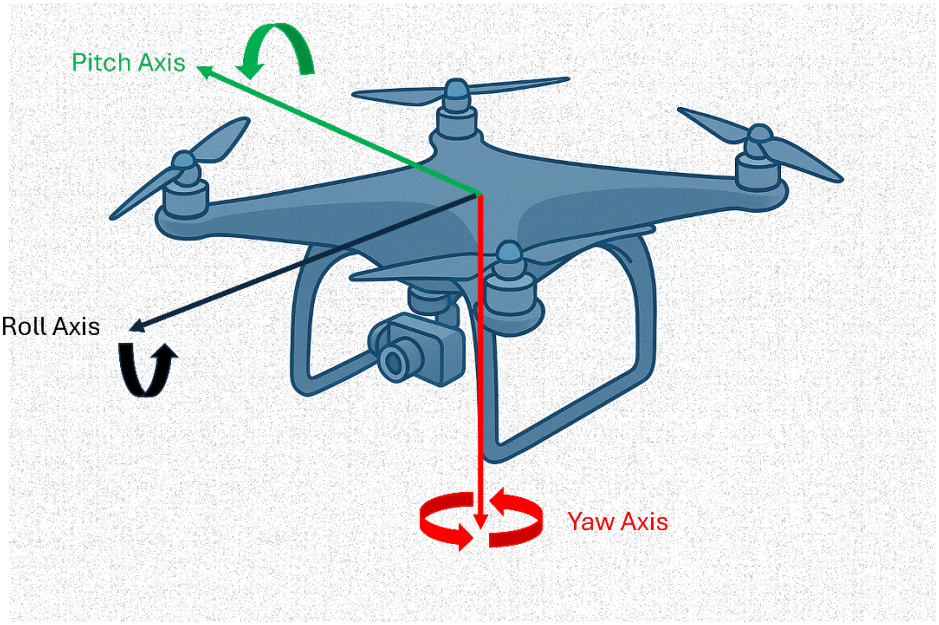


Figure 2: Axes of rotation

- **Roll**: Rotation around the longitudinal axis (nose to tail). Roll is controlled by varying thrust between the left and right propellers, causing the aircraft to tilt sideways.
- **Pitch**: Rotation around the lateral axis (wingtip to wingtip). Pitch is controlled by adjusting thrust between the front and rear propellers, enabling the drone to tilt forward or backward.
- **Yaw**: Rotation around the vertical axis. Yaw is achieved by applying differential torque between clockwise and counterclockwise propellers, allowing the drone to rotate left or right without changing altitude.

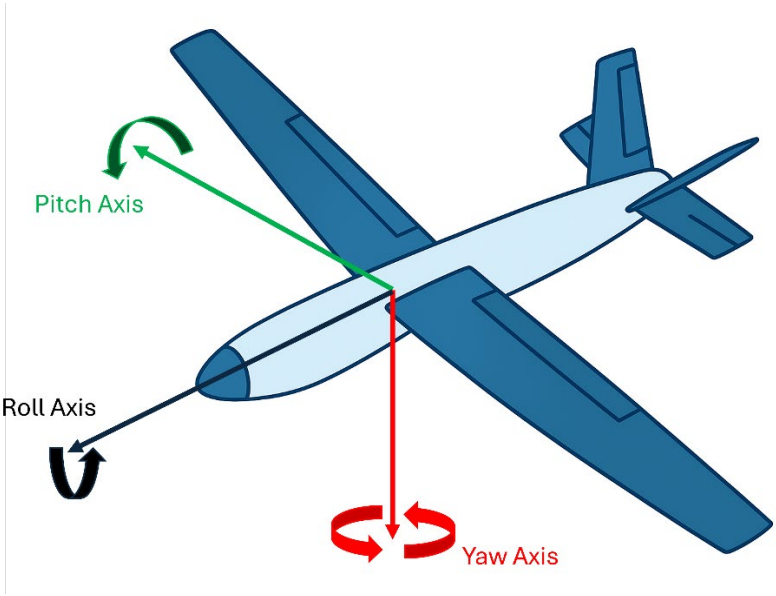


Figure 3: Fixed wing drone principal axes.

For fixed-wing drones, these movements are controlled by movable flight surfaces: ailerons for roll, elevators for pitch, and the rudder for yaw.

Understanding these principles is essential, as all drone and other aircraft maneuvers are based on these three fundamental axes of rotation.

1.3 Motors

Most drones are powered by electric motors, which can be either brushed or brushless.

- **Brushed motors** use physical contact between brushes and the commutator to transfer electricity. The friction created reduces efficiency, generates heat, and causes wear, leading to a shorter lifespan. They are cheaper and typically found in small, low-cost drones.
- **Brushless motors** operate using magnetic fields without physical contact, making them more efficient, powerful, and durable. They produce less heat, require minimal maintenance, and are the standard in modern UAS for better performance and reliability.

Both types of motors are powered and controlled by an Electronic Speed Controller (ESC), which regulates electrical current and ensures precise control of motor speed for stability and maneuverability.

2. Environmental effects on UAS performance

2.1 Wind

Wind is one of the most significant environmental factors affecting your drone's performance. Flying against strong winds increases the battery consumption, shortens flight time, and can compromise the stability. Behind tall obstacles such as buildings, trees, or towers, turbulence may occur for a distance up to ten times the height of the obstacle. For example, a 20-meter building can create turbulent airflow extending up to 200 meters downwind.

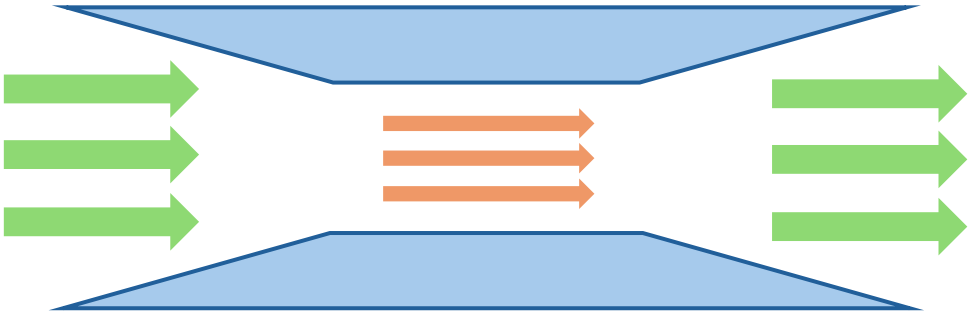


Figure 4: Venturi effect: wind can accelerate through narrow passages.

Remote pilots must always account for wind direction and strength during flight planning. Additionally, they should be aware of the **Venturi effect**: when wind passes through a narrow gap, such as between two buildings or through a valley, its speed can increase dramatically, creating unpredictable gusts. These sudden changes can destabilize the drone, reduce efficiency, and increase the risk of losing control.

2.2 Rain and humidity

Most drones are not designed to operate in rainy conditions. Water can penetrate motors and electronic components, leading to malfunctions or short circuits. Even if a drone is water-resistant, rain introduces additional risks: reduced visibility, extra weight from water accumulation, and increased power consumption.

Flights in rain or fog should be avoided unless the manufacturer explicitly certifies the UAS for such conditions and provides clear operational limits, such as IP rating, maximum precipitation intensity, and temperature range.

2.3 Icing and frost

Flying in cold and humid conditions can cause ice to form on propellers or wings. Ice alters the aerodynamic profile, reduces lift, adds weight, and can obstruct moving parts.

For multirotor drones, propeller icing severely decreases efficiency and may lead to loss of control. Remote pilots should avoid operating in freezing or near-freezing humid environments unless the aircraft is specifically certified for such conditions.

2.4 Temperature

The performance of LiPo batteries is highly sensitive to temperature and works best within the manufacturer's recommended range, typically around 15–25 °C.

- In (very) **low temperatures**, internal resistance increases, reducing power output and shortening flight time. Batteries may also struggle to deliver peak current, affecting stability and performance.
- **Excessive heat** can cause batteries to overheat, swell, or suffer permanent damage. This not only shortens lifespan but also poses a safety risk.

Always respect the temperature limits specified in the user manual.

2.5 Electromagnetic interference

Drones rely on radio links for control, telemetry, and navigation. These links can be disrupted by interference from external sources such as Wi-Fi antennas, mobile towers, radars, or high-voltage power lines. Even in some cases internal components, including onboard cameras or poorly shielded power cables, can also generate interference.

Such disruptions may affect GPS reception, compromise compass accuracy, or break the communication link between the remote controller and the aircraft.

Remote pilots must always assess the operational area for potential interference sources and take preventive measures before flight.

2.6 Kp index

The Kp index is a global measure of geomagnetic disturbances caused by solar activity. It is expressed on a scale from 0 to 9.

High Kp values indicate strong disturbances, which may reduce the accuracy of GNSS signals and affect drone navigation. A Kp index of 3 or below is generally safe, but when values rise to 5 or more, remote pilots should expect degraded positioning performance.

3. Principles of Command and Control

3.1 Overview

The **Command and Control (C2) link** provides communication between the remote pilot and the unmanned aircraft. It transmits control inputs from the remote pilot to the aircraft and sends telemetry data, such as position, altitude, speed, and system status, back to the pilot.

This link is essential for maintaining safe operation and is subject to performance and integrity requirements defined by the manufacturer and regulatory standards.

3.2 Data link frequencies

Most drones operate on radio frequency bands at **2.4 GHz and 5.8 GHz** for control and video transmission.

- At **2.4 GHz**, the maximum allowed transmission power is **100 mW EIRP**.
- At **5.8 GHz**, the maximum allowed transmission power is **also 100 mW EIRP**

These limits exist to prevent interference with other spectrum users. Because Wi-Fi and many other devices share these bands, interference is common in urban environments. Remote pilots should always maintain VLOS in the category OPEN to react quickly to signal disruptions.

Extra information

EIRP (Effective Isotropic Radiated Power) is a standardized way of measuring the total power radiated by the antenna, including the transmitter power and antenna gain. It ensures compliance with spectrum regulations and prevents interference with other devices using the same frequencies (like Wi-Fi).

3.3 Automatic flight modes and override

Modern drones often have multiple automatic flight modes such as waypoint navigation, orbit, or follow-me. These features can support specific tasks, but they do not make the aircraft autonomous. The remote pilot remains fully responsible for the safety of the operation and must be able to take manual control at any time.

Automatic	Autonomous
These drones follow pre-programmed instructions, or flight plans without continuous manual input, but they do not make independent decisions. The remote pilot can always intervene during the flight. For example, a drone flying a GPS waypoint mission is automatic, it executes commands but relies on the remote pilot for oversight and intervention.	These can perceive their environment, analyze data, and make decisions without human intervention during the mission. They adapt to changing conditions (e.g., avoiding obstacles, rerouting) based on onboard sensors and algorithms. Full autonomous means the drone can complete tasks without pilot supervision, which is not allowed in the category OPEN. A remote pilot must always be able to intervene.

Automatic modes rely on the C2 link, and a fail-safe function is usually pre-programmed to handle lost-link situations. Typical responses include hovering for a defined period, executing an automatic landing, or activating RTH.

The remote pilot must verify and configure these parameters before each flight to ensure they align with the operational environment and manufacturer specifications.

4. Familiarization with the UAS user manual

4.1 Overview of main elements

Every UAS must be accompanied by a user manual that provides detailed technical and operational information. The user manual is a critical safety document that ensures the remote pilot and operator understand the system's capabilities, limitations, and maintenance needs.

Purpose and scope

The user manual of your drone serves multiple functions:

- **System description**: It explains the architecture of the UAS, including all major components and subsystems.
- **Operational guidance**: It provides instructions for normal, contingency, and emergency procedures.
- **Safety assurance**: It outlines limitations, risk mitigations, and compliance with geo-awareness and containment requirements.
- **Maintenance instructions**: It details inspection intervals, component checks, and firmware updates to maintain airworthiness.

Essential components covered in the manual

1. **Airframe and structure**
    - Materials used, load limits, and structural integrity.
    - Diagrams showing dimensions and center of gravity.
2. **Propulsion system**
    - Motors (electric or fuel-powered), propellers, and Electronic Speed Controllers (ESCs).
    - Performance data: maximum thrust, endurance, and failure modes.
    - Safety measures for fuel or battery systems.
3. **Flight control system**
    - Layout and interface description, but also alerts for critical conditions (e.g., low battery, lost link).
    - Flight Controller: The core unit managing stability and navigation.
    - Autopilot: Pre-programmed flight execution with pilot override capability.
    - C2: Specifications for data link performance, latency, and redundancy.

4. **Sensors**
    - IMU (gyroscope and accelerometer) for attitude control.
    - GNSS/GPS module for positioning.
    - Compass and altimeter for orientation and altitude.
    - Additional sensors for geo-awareness and detect-and-avoid (DAA) functions.
5. **Power source**
    - Battery type, capacity, endurance, and emergency power provisions.
    - Charging and storage safety precautions.
6. **Safety features**
    - Geo-awareness and containment systems.
    - Emergency recovery systems (e.g., parachute, flight termination system).
    - Fail-safe procedures for lost link scenarios.

4.2 Limitations and flight envelope

Every UAS has defined performance limitations that form its flight envelope. These limitations are not optional and must always be respected by the remote pilot.

- **Maximum Take-Off Mass (MTOM)**: The UAS must not exceed the MTOM specified by the manufacturer or builder. For the Category OPEN, this is limited to less than 25 kg.
- **Maximum altitude**: Operations in the Category OPEN must remain below 120 m (400 ft) above the closest point of the surface. This parameter must be respected by the remote pilot despite the fact that the drone could possibly fly way higher than 120m (400ft).
- **Maximum wind speed**: The UAS manual specifies the maximum wind speed for safe operation. Exceeding this limit compromises controllability and stability.
- **Operating temperature range**: Batteries, sensors, and propulsion systems have temperature limits. Operating outside these ranges can lead to system failure or degraded performance.
- **Battery endurance**: The manual indicates expected flight time under normal conditions. Remote pilots must plan operations to avoid battery depletion during flight.

4.3 Controlling the UAS in all phases of flight

A competent remote pilot must demonstrate full control of the unmanned aircraft during all phases of flight:

- **Take-off**: Smooth and controlled lift-off, maintaining stability and orientation.
- **Hovering**: Ability to hold position accurately, even in variable wind conditions.
- **Basic flight patterns**: Executing straight lines, turns, climbs, and descents with precision.
- **Landing**: Safe and controlled descent, ensuring the aircraft touches down without damage.

Practicing in a safe, designated area builds confidence and reinforces proper technique. This matters because of:

- **Safety**: Prevents uncontrolled drift or fly-away incidents.
- **Legal compliance**: category OPEN operations require to always maintain control.
- **Operational resilience**: Ensures mission continuity even when automated systems fail.

Remote pilots should also train to fly without GNSS (GPS) assistance, as signals can be lost or degraded. In such cases, the remote pilot must rely on:

- Visual orientation (VLOS as required in the category OPEN).
- Manual stick control for navigation and stabilization.
- Knowledge of aircraft behavior without automated position-hold features.

Training flights in a designated safe practice area are essential for building confidence and developing muscle memory. These sessions allow remote pilots to practice normal, contingency, and emergency procedures without endangering people or property.

4.4 Safety features

Modern UAS are equipped with various safety-enhancing technologies designed to reduce operational risks and assist the remote pilot. Common features include:

- **Obstacle detection and avoidance**: Sensors that help prevent collisions with objects during flight. These systems are useful but may have limitations in low-light or adverse weather conditions.
- **Low-battery warnings**: Alerts that notify the remote pilot when power levels are critical, allowing time for safe landing.
- **Automatic RTH**: A function that commands the UAS to return to its take-off point in case of signal loss or low battery. While valuable, RTH requires proper configuration of the home point and awareness of surrounding obstacles.
- **Geo-awareness and altitude limits**: Features that prevent entry into restricted zones and ensure compliance with the 120 m altitude limit in the category OPEN.

These features increase safety, but they do not replace the remote pilot's legal and operational responsibility. The remote pilot must:

- Understand how each safety feature works, including its limitations.
- Configure settings correctly before flight in accordance with the category OPEN.
- Always be prepared to take manual control if automated systems fail.
- Keep the drone in VLOS

4.5 Lost link procedure

A lost link (or C2 link loss) occurs when communication between the UAS and the remote pilot station is interrupted. This situation must be anticipated and managed through a predefined procedure, configured before each flight as part of the pre-flight checks.

The lost link procedure ensures the aircraft behaves predictably and safely if control signals are lost, reducing risks to people, property, and other airspace users.

Before take-off, the remote pilot must select the most appropriate response based on:

- Operational environment (open fields vs. urban areas).
- Presence of obstacles (trees, buildings, power lines).
- Airspace limitations (e.g., altitude restrictions, geo-awareness zones).

There are two common options that are used by remote pilots:

1. **Return-to-Home (RTH):**
    - The UAS climbs to a predefined safe altitude, navigates back to the home point, and lands.
    - Recommended for open areas with minimal obstacles.
    - Ensure the home point and altitude are correctly set before flight.
2. **Automatic landing:**
    - The UAS descends and lands at its current position.
    - Preferred in obstacle-rich environments, where flying back could increase collision risk.

A remote pilot must fully understand how the lost link procedure works for their specific UAS model. Before each flight, the correct option should be configured based on the operational environment. The remote pilot must also verify that the chosen procedure complies with category OPEN rules, including altitude limits and geo-awareness requirements.

Lost link behavior should be tested in a safe practice area to confirm reliability. Remote pilots should avoid relying solely on automation and be prepared to regain manual control if the link is restored. Regular firmware updates are essential to maintain the effectiveness of safety functions and prevent unexpected failures.

4.6 Maximum height setting

In the category OPEN, EU regulations strictly limit the maximum flight altitude to 120 meters AGL (400ft). This restriction ensures safe separation from manned aircraft and compliance with airspace rules.

Most drones allow the remote pilot to configure a maximum height limit in the control application. Activating this setting is strongly recommended because it prevents the UAS from exceeding the legal altitude, even during automated flight modes such as RTH or waypoint navigation.

Before each flight, the remote pilot should:

- Confirm that the altitude limit is set to 120 m AGL or lower.
- Verify that geo-awareness features are active to avoid restricted zones.
- Understand that exceeding this limit is illegal and unsafe and may result in enforcement action.

Setting the maximum height is a simple but essential step to ensure regulatory compliance, operational safety, and predictable flight behavior.

When setting the maximum height parameter, the remote pilot must also consider the VLOS requirement. Even if the altitude is within the legal limit, the pilot must maintain continuous unaided visual contact with the UAS throughout the flight.

4.7 Loading geozones into the geo-awareness system

Geo-awareness is a critical safety feature required for many drones under the OPEN category, especially those bearing a class identification label (e.g., C1, C2, C3). It helps prevent entry into restricted or sensitive airspace by providing warnings or actively limiting the UAS from breaching these zones.

Operating in prohibited or restricted airspace is illegal under EU regulations and can lead to severe safety risks and enforcement actions. Geo-awareness facilitates adherence to established geozone regulations.

Geo-awareness systems rely on accurate airspace data. When required, remote pilots must:

- Download the latest geozone maps from Droneguide before each flight.
- Ensure updates are applied to the UAS control system or app.
- Verify that the data corresponds to the intended area of operation.

For a detailed overview of the category OPEN requirements and the conditions under which geo-awareness is mandatory, see *Annex A*.

4.8 Remote identification

Since January 2024, certain drones operating in the category OPEN must be equipped with Direct Remote Identification (DRI). This requirement applies to all drones bearing a C1, C2, or C3 class identification label. Additionally, some UAS geographical zones may mandate DRI regardless of the UAS class.

DRI is a system that continuously broadcasts identification and position data during flight. This allows competent authorities and law enforcement to:

- Monitor compliance with airspace rules.
- Enhance situational awareness and airspace safety.
- Identify operators in real time during inspections or enforcement actions.

To comply with EASA regulation, the operator's registration number, obtained by registration on Drone Portal, must be uploaded into the drone's DRI system

Finally, the remote pilot must confirm that the DRI function is active and transmitting throughout the operation. This ensures that authorities can link the aircraft to its registered operator during flight.

For a detailed overview of the category OPEN requirements and the conditions under which DRI is mandatory, please refer to *Annex A*.

4.9 Safety considerations

Safe handling of the UAS and its components is essential to prevent accidents and ensure compliance with operational standards. The following aspects must always be observed and considered by the remote pilot.

Securing the payload

Payloads must be attached strictly according to the manufacturer's instructions. Improperly secured payloads can:

- Shift the center of gravity, reducing stability and controllability.
- Detach mid-flight, creating a serious hazard for people and property on the ground.
- Before take-off, verify that all payload mounts are locked and that the weight does not exceed the UAS limits defined in the user manual.

Precautions against injuries

Rotors and sharp edges pose a significant risk during handling. To minimize injuries:

- Always power off the UAS before touching propellers or performing maintenance.
- Use protective gloves when installing or removing propellers.
- Keep hands, clothing, and objects clear of rotors during motor tests or calibration.
- Never attempt to catch the drone while rotors are spinning.

Safe battery handling

Lithium-based batteries require special care to prevent fire or damage:

- Inspect batteries before each use for swelling, cracks, or leaks.
- Store batteries at medium charge in a cool, dry place.
- Never leave batteries charging unattended and always use the charger recommended by the manufacturer.
- Avoid exposure to extreme temperatures and never puncture or dispose of batteries in regular trash.

Ignoring these safety precautions can have serious consequences. Loose payloads may cause loss of control and crashes, while improper handling of rotors can lead to severe injuries. Mishandling batteries increases the risk of fire hazards or explosions, endangering both the operator and bystanders.

4.10 Maintenance instructions

Regular maintenance is essential for safe operations, reliability, and compliance with EU regulations. Post-flight checks and scheduled servicing help prevent failures and ensure the UAS remains within its certified configuration, especially for drones bearing a class identification label (e.g. C0, C1, C2,...).

Follow the manufacturer's maintenance schedule as described in the user manual of your drone. Replace worn or damaged components only with original parts to maintain compliance with the UAS-class and ensure safety. Firmware updates should be applied regularly to keep safety systems and geo-awareness up to date.

Critical components require extra care:

- **Propellers**: Replace immediately if damaged.
- **Batteries**: Inspect for swelling, leaks, or irregular voltage. Store at medium charge and in a fireproof container when not in use.
- **Electronic systems**: Check connectors and cables for wear or corrosion.

Maintenance is not complete without proper record keeping. Two logs are strongly recommended:

- **A flight log**, recording the date, location, duration, and remarks for each flight. This supports compliance and helps build pilot experience.
- **A defect and maintenance log**, tracking recurring issues and documenting repairs or part replacements. This ensures timely corrective action and provides evidence of proper maintenance.

5. To recap

A solid understanding of unmanned aircraft systems is the foundation of safe and compliant operations. Remote pilots must know how their drone flies, how environmental factors such as wind and temperature affect performance, and how to operate the C2 system effectively. They must respect all technical limitations, configure safety features correctly, and remain ready to take manual control at any time, especially in contingency situations.

Central to this preparation is the UAS user manual. This document contains essential information on system limitations, operating procedures, and maintenance requirements. Ignoring these instructions can lead to unsafe conditions and regulatory violations. **Thoroughly reading and understanding the user manual is not optional, it is a legal and operational necessity.**

By applying manufacturer instructions, respecting EASA regulations, and maintaining disciplined operational habits, remote pilots guarantee that every flight is conducted safely, legally, and professionally.

Module 7: Privacy and Data Protection

Privacy and the protection of personal data are fundamental rights in Europe.

As a remote pilot, you are not only responsible for the safe operation of your drone but also for the way images, videos, or any data collected during your flights may affect other people's privacy. **This responsibility applies to everybody, no matter whether you fly as a hobbyist or as a professional.**

There are no rules about privacy and data protection specific to drones. The general rules apply.

1. Understanding the risks to privacy and data protection

1.1 Right to privacy

Every individual has the right to private and family life, to the protection of their home, and to the confidentiality of their personal information. This right extends to images, videos, conversations, or any data that can identify a person. Flying a drone does not give you the right to invade someone else's privacy. Intrusions into private life without consent are unlawful, whether you publish the data or keep it for yourself.

1.2 What is personal data

Personal data is any information that relates to an identified or identifiable person. This includes faces, license plates, addresses, distinctive clothing, body characteristics, or even the location of someone's home.

Even if you capture this data unintentionally, it is still considered personal data. A simple video of your neighbor in his garden, if he is identifiable, is personal data.

1.3 Privacy in private and public spaces

People have a reasonable expectation of privacy not only in their own homes but also in certain semi-public places such as hotel rooms, offices, or professional premises. Even in public areas such as parks or beaches, targeted filming of individuals without their consent is a violation of privacy.

In general, untargeted images of a crowd may sometimes be acceptable, but you must ensure that no one is individually identifiable, unless permission has been obtained.

2. Legal framework in the EU and in Belgium

2.1 Article 8 of the European Convention on Human Rights (ECHR) – Right to respect for private and family life

This article states that everyone has the right to respect for his private and family life, his home and his correspondence.

There shall be no interference by a public authority with the exercise of this right except such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others.

2.2 General Data Protection Regulation (GDPR)

Regulation (EU) 2016/679, known as the GDPR, is the key European regulation on personal data protection. It applies to all drone operations where personal data is collected.

The GDPR establishes several key principles:

- **Lawfulness, fairness, and transparency**: personal data may only be processed if there is a valid legal basis, such as consent or legitimate interest.
- **Purpose limitation**: data must be collected only for specific, explicit, and legitimate purposes.
- **Data minimization**: only collect what is strictly necessary for your operation.
- **Accuracy**: data must be kept up to date.
- **Storage limitation**: personal data must be kept securely and only for as long as necessary.
- **Integrity and confidentiality**: the data must be secured against unauthorized access.
- **Rights of individuals**: persons have the following rights
    - Right of access - Know what data is held and how it's used
    - Right to rectification - Correct inaccurate data
    - Right to erasure ("right to be forgotten") - Delete data when no longer needed
    - Right to data portability - Transfer data between service providers
    - Right to object - Stop certain types of processing

- Right to be informed - Transparency about data use
- Right to restrict processing - Limit how data is used
- Rights related to automated decision-making and profiling.

2.2 Belgian privacy law

The Belgian law of 30 July 2018 on the protection of natural persons with regard to the processing of personal data implements the European GDPR at national level.

In addition, the use of drones as surveillance cameras need to comply with the Belgian law of 21 March 2007 regulating the installation and use of surveillance cameras (Camera Law)

2.3 Consequences of non-compliance

Violating privacy or data protection law can lead to fines, penalties from the data protection authority, and damage to your reputation as a remote pilot.

3. Practical application for remote pilots

3.1 Consent and publication

Consent must be specific to the use you plan, and it can be withdrawn at any time. If withdrawn, you must stop using the image and remove it from all platforms.

Capturing an image is not the same as being allowed to publish it. Even if someone agrees to be filmed, you still need explicit consent to share their image on social media, websites, or printed material.

3.2 Images of minors

Special rules apply to minors. For anyone under 18, you need the consent of their legal representatives, usually their parents. From the age of 13, both the minor and the parents must give their consent. Publishing images of minors without these permissions is a violation of privacy law.

3.3 Domestic and recreational use

Even if you are flying for fun in your garden, the privacy law still applies. If you film your neighbor in a way that makes him identifiable, the footage is considered personal data, and the same legal obligations apply.

3.4 Surveillance and targeting

Targeted surveillance with a drone is not permitted. You cannot follow or film specific individuals without their explicit agreement. In public places, avoid pointing your camera directly at individuals. Use wide shots, lower resolution, or angles that do not allow recognition. This helps respect the principle of data minimization.

3.5 Good practices under GDPR

To operate responsibly, always follow these guidelines:

- Minimize the amount of data collected. Do not record or store images unnecessarily.
- Secure your data. If you keep footage, store it safely and do not share it unless legally permitted.
- Respect the requests of individuals. If someone asks not to be filmed, adapt your UAS operation to avoid capturing them.
- Inform people upfront if possible, for example when flying at public events, so they know images may be taken.
- Always check whether your planned use of images is justified, and whether consent is needed.

4. To recap

As a remote pilot, you must always respect privacy and data protection. Personal data such as images, videos, or identifiable details must be handled with care. The European and Belgian legislation on privacy and data protection impose strict obligations.

In practice, this means never targeting people without consent, minimizing data collection, storing images only as long as necessary, and always respecting the rights of the people filmed. Remember that you are the one legally responsible. The safe and lawful use of drones is not only about avoiding accidents in the air; it is also about protecting the dignity and privacy of the people on the ground.

Module 8: Insurance

Flying a drone always carries a certain level of risk. Even a small UAS can cause injury to a person or significant damage to property or another aircraft. For this reason, liability insurance is not only highly recommended but, in many cases, legally required.

Insurance protects victims if something goes wrong and protects the UAS operator from having to personally cover potentially high costs. In this module, we will look at liability in case of accidents, the applicable European rules, and the specific national requirements such as those in Belgium.

1. Liability in case of an accident or incident

1.1 Understanding accidents and incidents

- An **accident** with a UAS means an occurrence that happens during its operation, starting when the UAS is ready to move for flight and ending when it has stopped after the flight and its main propulsion system is shut down, whereby:
    - A person is **fatally or seriously injured** as a result of:
        - being in the aircraft, or
        - direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
        - direct exposure to jet blast, or
    - The UAS sustains **damage or structural failure** which:
        - adversely affects the structural strength, performance or flight characteristics of the aircraft, and
        - would normally require major repair or replacement of the affected component, or
    - The UAS is **missing** or is **completely inaccessible**.
- An **incident** is an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of the operation.

Both situations can result in liability for the operator.

1.2 Types of liability

There are two main categories of liability in drone operations:

- **Bodily injury**: harm caused directly or indirectly to another person, such as a drone falling on someone.
- **Property damage**: harm caused to third-party property, such as a drone flying through a window or damaging a vehicle.

1.3 Responsibility of the operator

The UAS operator is the person or company legally responsible for ensuring that insurance is in place. Even if the drone is piloted by another remote pilot, the UAS operator remains liable. In case of an accident, third parties can always file claims against the UAS operator.

If the operator is under 18, liability generally falls under the parents' responsibility, and their family insurance may apply.

1.4 Consequences of no insurance

Operating a drone without the required liability insurance can have serious consequences. The operator may be fined, face legal penalties, and, most importantly, be personally liable for all damages. This can mean covering medical expenses, property repairs, or even compensation for loss of income.

2. EU regulations relating to insurance

2.1 Regulation (EC) 785/2004

This regulation imposes minimum insurance requirements for aircraft operators, including UAS operators. For UAS with a Maximum Take-Off Mass (MTOM) of **20 kg or more**, insurance must comply with this regulation. The insurance should include cover for death, personal injury and damage to property caused by accidents. Minimum coverage amounts depend on the MTOM of the drone.

2.2 Implementing Regulation (EU) 2019/947

This regulation on UAS operations requires that **operators provide proof of insurance when registering**, if insurance is required by EU or national law. It also places the legal responsibility on the UAS operator to ensure proper coverage is in place before any operation.

3. National requirements

In Belgium, when registering as a UAS operator on Drone Portal, you will be requested to include the reference number of your insurance. Depending on your case (see below under point 3.1), this may be the reference number of your family civil liability insurance or your civil liability insurance which is compliant with Regulation (EC) 785/2004.

3.1 Belgium – Royal Decree of 8 November 2020 (Article 12)

<table>
<tr><th>UAS Operation Category</th><th>UAS MTOM</th><th>Use</th><th>Insurance</th></tr>
<tr><td rowspan="4">OPEN</td><td rowspan="2"><900g</td><td>Exclusively private</td><td>Civil liability insurance is not legally required but strongly recommended.
In many cases, this may already be covered by your family civil liability insurance.</td></tr>
<tr><td>Professional</td><td rowspan="2">Civil liability insurance is always mandatory, covering bodily injury and property damage</td></tr>
<tr><td>≥900g & <20kg</td><td>Private or professional</td></tr>
<tr><td>≥20kg</td><td>Private or professional</td><td>Insurance coverage in compliance with Regulation (EC) 785/2004 is mandatory.</td></tr>
<tr><td>SPECIFIC</td><td>n.a.</td><td>Private or professional</td><td>Insurance coverage in compliance with Regulation (EC) 785/2004 is mandatory.</td></tr>
</table>

In the latter 2 cases, it needs to be mentioned in the insurance document that the insurance is in compliance with Regulation (EC) 785/2004.

3.2 Other Member States

Insurance rules are not fully harmonized across Europe. Each Member State can set its own thresholds and requirements.

For example, one country may require insurance for all drones, while another may only apply it above a certain weight. Before flying abroad, UAS operators must check and comply with the national rules of the country where the UAS operation will take place.

3.3 Practical aspects of insurance

Always keep proof of insurance with you when flying. Authorities, inspectors or police may request it during checks. A valid insurance certificate must be shown. This can be a paper version (hard copy) or digital copy.

Insurance policies should be reviewed regularly to make sure they are up to date and still cover your operations. Coverage may need adjustment if you change from private to professional use.

4. To recap

Insurance is an essential part of responsible UAS operations. It protects victims, ensures that accidents are properly compensated, and shields the UAS operator from devastating financial consequences.

As a UAS operator, you must always:

- Verify which liability insurance is required for your drone
- Ensure that coverage includes bodily injury and property damage
- Keep proof of insurance during UAS operations
- Review your policy regularly to adapt to changes in your UAS activity

Accidents can happen even to the most experienced remote pilots. Insurance is not just a legal formality. **It is your safety net when things go wrong**.

Module 9: Security

Flying a drone is not only a matter of safety but also of **security**. While safety focuses on avoiding accidents, security is about preventing drones from being misused to intentionally cause harm or disrupt society. Security risks exist because drones are widely available, affordable, and capable of carrying cameras, sensors, or even payloads. This makes them attractive for unlawful activities, and as a responsible UAS operator or remote pilot, you must understand the risks, the rules, and your obligations.

1. Understanding Security Risks

1.1 What is a security risk?

A security risk is any situation in which a drone could be misused for malicious purposes. Unlike accidental mistakes, these are intentional actions designed to cause harm, disrupt public life, or compromise sensitive infrastructure. Security risks include **jamming, hacking, GPS spoofing, or even the deliberate use of drones for unlawful activities** such as smuggling or terrorism.

1.2 Examples of security risks

- **Critical infrastructure threats**: energy infrastructures, airports, water supply, digital infrastructure, electronic communication... are all critical for society. If a drone interferes with these, the consequences can be severe. Flying near these sites without permission is strictly prohibited.
- **Malicious attacks**: Drones could be weaponized (carrying explosives or harmful substances), used for hoax attacks to create panic in a crowd, or for dispersal attacks with chemicals.
- **Illegal activities**: Smuggling drugs or contraband into prisons, espionage, or using drones to bypass security perimeters are common examples.

1.3 Why remote pilots must be aware

Even if your flight is legal and recreational, your actions can still raise suspicion. Authorities treat drones flying near sensitive sites very seriously. As a remote pilot, you must always be aware of how your operation could be perceived. For security reasons, you may be requested by competent authorities, such as the police, to stop your drone flight.

2. Overview of EU Regulations related to security

2.1 Geo-awareness and restrictions

In certain cases, drones need to be equipped with **geo-awareness systems** that alert the pilot to avoid entering restricted areas, such as airports or military zones. These restrictions exist to protect sensitive areas and critical infrastructure. Remote pilots must load updated geozone data into their drones and respect all prohibitions and restrictions.

2.2 Direct Remote Identification (DRI)

In most cases, drones need to be equipped with **direct remote identification (DRI),** and this system needs to be active. A DRI system broadcasts the following data so that authorities can identify them:

- The serial number of the drone
- The registration number of the UAS operator
- The position of the drone
- The position of the pilot or take-off point.

The registration number of the operator must be uploaded into the drone before flight. It allows authorities to trace the operator in case of suspicious behavior and improves community acceptance by making drone operations more transparent.

2.3 Geozones

Each member state may create geozones for security purposes.

Examples of geozones created for security purposes are those protecting prisons, governmental buildings, military areas or nuclear facilities.

Flying in these areas without explicit prior flight authorization is strictly forbidden and punishable by law.

For more information on geozones, see *Module 2: Airspace restrictions*.

2.4 Cybersecurity

Drones rely heavily on data links, GPS, and software systems. These are vulnerable to cyberattacks such as **GPS spoofing** (sending false signals which causes incorrect position, navigation and timing data) or **jamming** (blocking radio frequency interference (RFI) which disrupts the command-and-control link). EU regulations encourage

manufacturers to provide protections, but ultimately, the remote pilot must stay vigilant and know how to react if abnormal behavior occurs.

3. Different approaches in Member States

Each EU Member State may impose different **additional restrictions** for security reasons.

Penalties for not respecting security-based restrictions vary widely and can include heavy fines or criminal charges.

Before flying in another Member State, UAS operators must check local drone regulations and comply with any additional security measures. Not knowing the rules does not exempt the UAS operator from responsibility.

4. Protecting UAS Operations

4.1 Preventing interference

One of the most common security risks is **signal interference**. To prevent this, always operate your UAS on the frequencies authorized in your country (in Belgium this is **2.4 GHz or 5.8 GHz**). Avoid areas with high electromagnetic interference such as high-voltage lines, dense city centers, or near powerful antennas.

4.2 Updating systems

Manufacturers frequently release firmware updates to patch vulnerabilities. Failing to update your UAS software may expose it to security flaws that hackers could exploit. Always check for updates and perform a test flight before starting your operation.

4.3 Handling abnormal situations

If you suspect your UAS is compromised, for example, if it starts behaving abnormally, or if you suspect jamming or GPS spoofing, you must **land immediately and investigate**. Continuing the flight could result in loss of control and legal consequences.

4.4 Good practices for security

- Keep your **operator registration number** (in particular the last 3 digits) private. Do not post it online or share it unnecessarily.
- Never publish detailed flight plans or operational data publicly. Such information could be exploited by malicious individuals.

- Avoid overflying sensitive areas, even if not explicitly prohibited by law.
- Report suspicious drone behavior to the authorities. Cooperation with law enforcement is part of responsible drone operation.

5. To recap

Security is a core responsibility for all drone operators and remote pilots. Unlike safety, which protects against accidental harm, security protects society against intentional misuse. Risks include interference, hacking, GPS spoofing, and unlawful activities such as smuggling or attacks on critical infrastructure.

As a responsible remote pilot, you must:

- Understand the risks and how to prevent them
- Always use only authorized frequencies and keep your systems updated
- Respect geozone restrictions
- Land immediately if you suspect interference or hacking.

As UAS operator, it is advisable to keep your registration number private.

By following these principles, you not only comply with the law but also contribute to protecting aviation, society, and your own reputation as remote pilot and/or UAS operator.

Annex A

Category OPEN

Not over an assembly of people[1] - up to a maximum 120m AGL[2,3,4] - only VLOS[5, 6,7,8] - no dropping[9] - respect the geozones[10]

UAS operations		Remote pilot		UAS[11] (drone)			Operator
Sub-cat.	Area of operations	Age	Competency requirements	UAS-class	MTOM[12] / Joule (J)	Direct Remote ID[13] / Geo-awareness[14]	Registration
A1 **Flying over people**	- You may fly over uninvolved persons[15] (Not over an assembly of people[1]) - Flying over uninvolved persons should be avoided as much as possible. If unavoidable, it must be done with extreme caution.	No min. Age Min. 14 y/o	- Familiar with the UAS user manual - Following the online theoretical A1/A3 course is not mandatory, but recommended	Privately built (max. speed <19m/s)[16] C0 which is also a toy C0 (no toy) Non-Cx[17]	<250g	Not mandatory, unless required by the geozone	Mandatory, unless: - The UAS has no camera or sensor capable of capturing personal data; or - The UAS is considered a toy
	- Intentional flights over uninvolved persons[15] are not allowed - If you unexpectedly fly over an uninvolved person[15], then you must reduce the duration as much as possible	Min. 14 y/o	- Familiar with the UAS user manual; and - Holds a valid A1/A3 certificate of completion for the online theory exam[18]	C1	<900g or <80J	Mandatory	Mandatory
A2 **Flying close to people**	- Intentional flights over uninvolved persons[15] are not allowed; and - You must maintain a safe horizontal distance of at least 30 meters from uninvolved persons (reduced to a minimum of 5 meters in low-speed mode at 3 m/s); and - You must follow the 1:1 rule[20]	Min. 16 y/o	- Familiar with the UAS user manual; and - Holds a valid A1/A3 certificate of completion for the online theory exam[18] ; and - Holds a valid A2 certificate of competency[19]	C2	<4kg	Mandatory	Mandatory
A3 **Flying far away from people**	- You may only fly in areas where you can reasonably expect that uninvolved persons[15] will not be endangered; and - You must maintain a safe horizontal distance of at least 150 meters from residential, commercial, industrial, or recreational zones; and - You must maintain a safe horizontal distance of at least 30 meters from persons; and - You must follow the 1:1 rule[20]; and - The distance to uninvolved persons[15] must not be less than the distance the unmanned aircraft would travel in 2 seconds at maximum speed.	Min. 14 y/o	- Familiar with the UAS user manual - Following the online theoretical A1/A3 course is not mandatory, but recommended	C0	<250g	Not mandatory, unless required by the geozone	Mandatory
			- Familiar with the UAS user manual; and - Holds a valid A1/A3 certificate of completion for the online theory exam[18]	C1	<900g or <80J	Mandatory	
				C2	<4kg		
				C3	<25kg		
				C4		Not mandatory, unless required by the geozone	
				Non-Cx[17]			
				Privately built[16]			

Before starting the flight, always check on Droneguide whether your UAS operation is located in one or more geozones.
If so, you must additionally comply with the (cumulative) access conditions of these geozones, even when flying in the category OPEN.
You can find these geozone access conditions on Droneguide. (*www.map.droneguide.be*).

More info is available on the BCAA website: https://mobilit.belgium.be/nl/luchtvaart/vliegen-met/drones-uas

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Endnotes

1. An **assembly of people** is defined as a situation where so many individuals are present that a person cannot easily move away or avoid the consequences of an uncontrolled unmanned aircraft.
   Examples include: Sports, cultural, religious, or political events; beaches or parks on a sunny day; commercial streets during store opening hours; ski resorts, slopes, or tracks
2. You may not fly so high that your unmanned aircraft is no longer within your visual line of sight (see VLOS requirement). Certain geozones also impose altitude restrictions that must be respected.
3. When the unmanned aircraft flies within a horizontal distance of 50 meters from an artificial obstacle taller than 105 meters, the maximum flight height may be increased to 15 meters above the obstacle's height, upon request by the entity responsible for the obstacle.
4. **AGL** (Above Ground Level) means above the ground. If the UAS operation starts from natural terrain elevation or above terrain with natural height variations, the unmanned aircraft must stay within 120 meters of the nearest point on the earth's surface. Distance measurement is adjusted to the geographical features of the terrain, such as plains, hills, or mountains.
5. **VLOS** (Visual Line of Sight) means within sight. In a VLOS UAS operation, the remote pilot maintains continuous unaided visual contact with the UAS. This allows the pilot to monitor the UAS's flight path relative to other aircraft, people, and obstacles, in order to avoid collisions.
6. **FPV** (First-Person View) is allowed in the OPEN category provided that the remote pilot is assisted by an unmanned aircraft observer. An unmanned aircraft observer is a person who is positioned next to the remote pilot, ensures visual observation of the unmanned aircraft without aids, and assists the remote pilot in maintaining the unmanned aircraft within VLOS and conducting the flight safely.
7. Exception to the VLOS requirement: in **follow-me mode** up to a distance of 50m from the remote pilot. The follow-me mode is a flight execution mode of a UAS in which the unmanned aircraft constantly follows the remote pilot, in this case within a radius of 50m.
8. You can also **fly at night** in the category OPEN, but only as long as the UAS operation remains within VLOS and a green flashing light is activated on your UAS.
9. **No dropping** means that during the flight, the unmanned aircraft is not allowed to release any material.
10. **Geozones** = Geographical UAS zone = a portion of airspace designated by the BCAA in which UAS operations are facilitated, restricted, or prohibited in order to mitigate risks related to safety, privacy, personal data protection, security, or the environment resulting from UAS operations. These geozones can be found on Droneguide. (*www.map.droneguide.be*).
11. **UAS** (= Unmanned Aircraft System) stands for unmanned aircraft system.
12. **MTOM** (= Maximum take-off mass) means maximum take-off mass. MTOM is the maximum mass of the unmanned aircraft, including payload and fuel, as defined by the manufacturer or builder, at which operations with the unmanned aircraft can be performed.
13. **Direct remote identification** = a system that enables the local broadcast of information about an operating unmanned aircraft, including its marking, so that this information can be obtained without physical access to the unmanned aircraft.
14. **Geo-awareness** = a function that, based on data provided by the Member States, detects a potential breach of airspace restrictions and alerts remote pilots so they can immediately take effective measures to avoid that breach.
15. A **non-involved person** is someone who does not participate in the UAS operation or is not aware of the instructions and safety procedures of the UAS operator.
    A person can only be considered an involved person if they have given explicit consent before the flight to participate in the UAS operation (even through indirect involvement as a spectator or simply by being overflown by the UAS) and have received clear instructions and safety precautions on what to do in case of unexpected behavior of the UAS.
16. A **privately built UAS** is a UAS that has been assembled or manufactured by the builder for personal use. A UAS made from a set of components marketed as a kit does not fall under the definition of a privately built UAS.
17. A **Non-Cx UAS** is a UAS without a class identification label (Cx), provided that this UAS was placed on the market before 1 January 2024.
18. An **A1/A3 proof of completion of the online theory exam** is obtained after completing the A1/A3 online theoretical course and passing the A1/A3 online theory exam. More information about this can be found on the BCAA website.
    When using a UAS with a C0 class identification label, or a privately built UAS or Non-Cx UAS, both under 250g, completing the A1/A3 online theoretical course is not mandatory, but it is recommended.
19. An **A2 certificate of competency** is obtained after passing the A2 theory exam and declaring practical self-training. More information about this can be found on the BCAA website.
20. The **1:1 rule** means that the remote pilot must keep the unmanned aircraft at a lateral distance from any non-involved person that is no less than the altitude. For example: if the unmanned aircraft is flying at an altitude of 40 m, the lateral distance from any non-involved person must also be at least 40 m.
21. An **A1/A3 proof of completion of the online theory exam** is obtained after completing the A1/A3 online theoretical course and passing the A1/A3 online theory exam. More information about this can be found on the BCAA website.