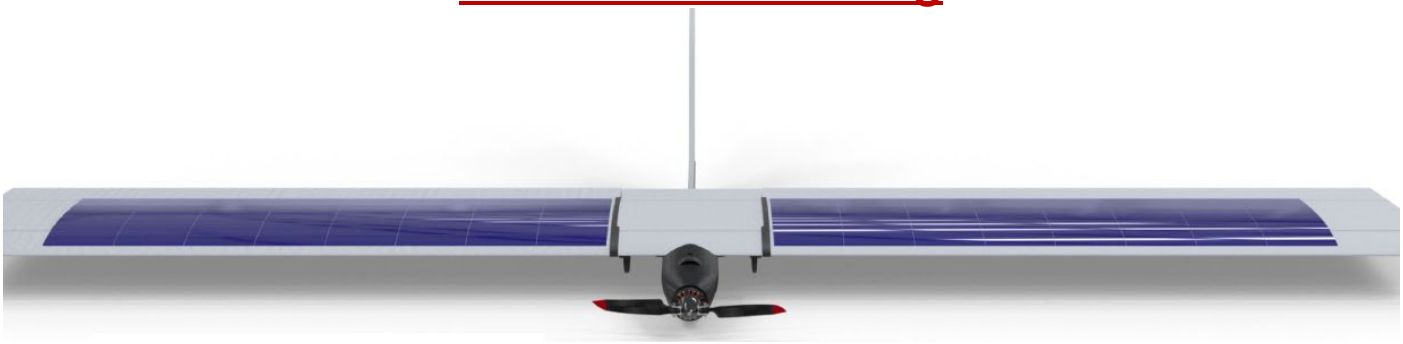
Solar UAV – Fixed Wing



Specifically engineered and entirely manufactured in Italy. To date, in its operational capacity, it stands unparalleled on the global stage. It can autonomously monitor extensive areas for over eight hours.

Among its key strengths is ease of use

Due to its lightweight design, compact dimensions, and electric propulsion, this drone can be deployed with a simple hand launch.

The drone also comes equipped with a FLIR® thermal sensor and onboard proprietary technology.

Italian-Made Quality

In the current technological landscape, the drone represents a pinnacle of Italian mechatronic excellence, merging design, functionality, and efficiency into one advanced solution. Entirely engineered and manufactured in Italy, this drone is a seamless blend of Italian engineering tradition and innovation.

The selection of premium materials, meticulous attention to detail, and stringent testing and quality control procedures are the results of years of research. Each component, from the frame

to the internal circuits, from the propellers to the sensors, has been designed and optimized to ensure optimal performance under all operational conditions.

The decision to manufacture the drone exclusively in Italy was not merely a field choice but a clear statement of intent: to provide the market with a product that epitomizes Italian excellence in terms of design, functionality, and reliability. In the spectrum of drones for fire prevention and intervention, it stands out not only for its performance but also for its strong identity linked to Italian craftsmanship, a global symbol of quality and innovation.

Primary Use Cases:

Firefighting drones for environmental Monitoring in Risk Zones
The exponential growth of wildfires is often attributed to climate change, necessitating structural and societal interventions. Continuous monitoring of high-risk areas during daylight hours can make a substantial contribution to mitigating this phenomenon. The drone is easily programmable via its accompanying radio or laptop and allows for autonomous patrolling of areas up to 510 hectares per flight hour. The patrol pattern can be specified as individual points along a predetermined path or as automated grids over a selected area. Mission repetitions over the same or different areas are technically feasible.

Firefighting drones for surveillance and Deterrence of Arson
Unlike conventional multicopters that require battery replacement approximately every 20 minutes, this solar uav can remain airborne throughout the day, offering uninterrupted surveillance. An additional distinct advantage is its quiet operation. While the noise of multicopters

is easily detectable even from a considerable distance, alerting potential arsonists, it operates in near-complete silence, making its detection more challenging and enhancing its deterrent effect.

Flames and Possible Rekindles Search with firefighting drones
In scenarios where a fire is already in progress or the primary front has been contained, scouting the affected area for small secondary fires or remaining embers that can lead to possible rekindles is advisable. The fire prevention drone proves particularly effective in this role. Conducting these control operations from above not only prevents further damage of the affected areas but also eliminates reliance on traditional aerial assets, which could be already engaged on other fronts and certainly entail higher operational costs and risks. Above all it allows to not expose the staff to risk.

Beyond Firefighting
This is not just a fire prevention and management tool but also a potent ally in **public order maintenance and risk area protection**. With an integrated secondary FullHD camera transmitting a real-time video feed to the Ground Station, it enables real-time surveillance of zones that have triggered an alarm.

This function is especially useful for identifying and monitoring suspicious activities or threats, thus ensuring an immediate response and actively contributing to public safety. With the solar drone, surveillance becomes proactive. Each mission turns into an opportunity to ensure the safety and peace of mind of communities.

Lightness, Endurance, and Additional Advantages

Low weight and high resistance
The drone is an exemplary engineering solution, designed to be both lightweight and durable. This combination is crucial for maneuverability in various operational conditions, from dense forests to arid hill zones. Its structural integrity is engineered to withstand typical climatic and environmental conditions, while its low weight ensures rapid and agile responsiveness to every command, coupled with a minimal offensive factor.

High autonomy
The drone's endurance is another crucial aspect. With the ability to monitor extensive areas for over eight hours, this drone emerges as an exceptional asset in fire prevention. Its integrated solar panels not only contribute to its extended flight duration but also signify our commitment to environmentally sustainable solutions.

Silent flight
In addition to lightness and endurance, the drone offers an array of unique advantages:

- Its electric propulsion ensures quiet flight, an essential requirement for operations in protected areas or near residential communities.
- Ease of use is another strength: with hand-launch capabilities, the drone can be deployed within moments, reducing response times in critical situations.

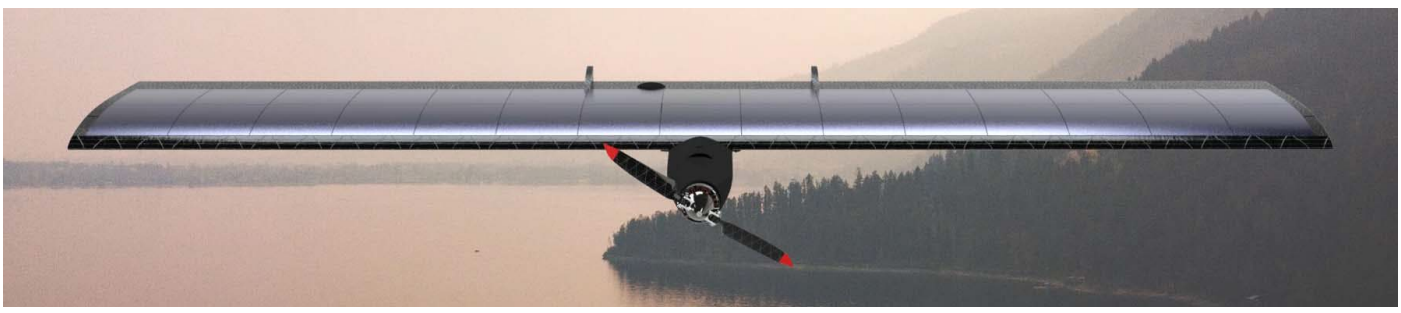
Technology and innovation
This solar drone is, without a doubt, a fusion of technology and innovation. Every detail, from material selection to aerodynamic design, aims to provide industry professionals with a reliable, effective, and cutting-edge tool, poised to meet the challenges of a constantly evolving world.

Flight Performance and Functionality
The wildfire drone stands out not only for its physical characteristics but also for its exceptional flight capabilities and performance metrics. At the core of the drone is a sophisticated navigation and control system ensuring both precision and stability, even under adverse atmospheric conditions.

One of the key features of the solar is its ability to **maintain an accurate trajectory** even when subject to lateral winds or sudden gusts. This capability translates into meticulous monitoring of high-risk areas, providing sharp details and precise data.

In terms of flight performance, the solar drone has a **maximum speed of 70 km/h and a cruising speed optimized at 40 km/h** to cover expansive areas in minimal time while ensuring efficient energy consumption.

The autonomous flight mode, supported by **multi-constellation systems (GPS, GLONASS, Galileo and BeiDou)**, enables the wildfire prevention drone to follow predetermined routes with high accuracy or to adopt advanced safety standards.

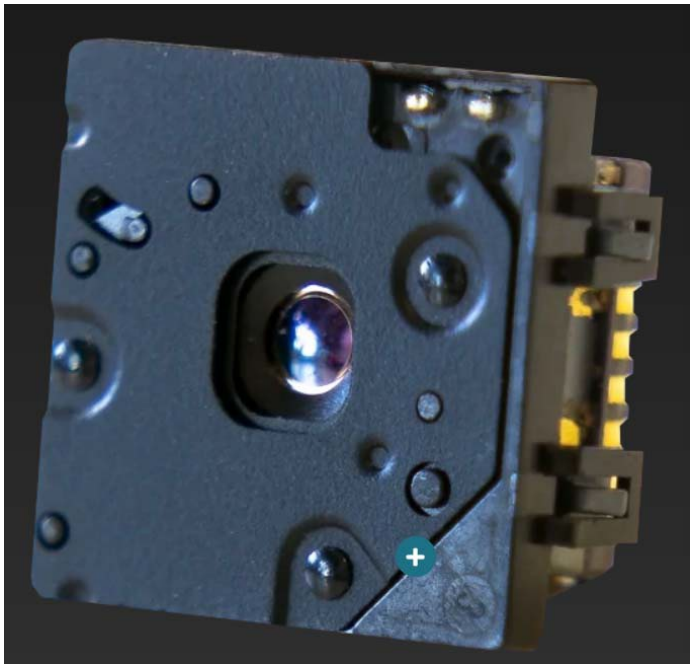


In case of signal loss or anomalies, the drone is programmed to autonomously return to its take-off point, thereby mitigating risks associated with malfunctions.

The user interface of the control system is designed with utmost attention to operator needs. Intuitive and responsive, it allows for granular and immediate control of the drone, simplifying even the most complex operations. The advanced features of the interface, coupled with flight performance and other guaranteed system requirements, position the solar drone as a new benchmark in the field of wildfire prevention and firefighting drones.

At the heart of the detection system is a FLIR® thermal sensor.

This high-precision component is augmented by proprietary firmware, developed explicitly for detecting thermal variations caused by live flames, with accuracy so high that it can identify small fire outbreaks (diameter 40-50 cm) even from a height of 120 meters.



The decision to focus on thermal anomalies has proven crucial, as it enables identification of a fire even in its nascent stages.

After comprehensive tests and evaluations, reliance on artificial intelligence for smoke detection was ruled out. This choice was motivated by the fact that many fires, especially initially, can develop with minimal or no smoke emission. By focusing on thermal variations, the system avoids the risk of overlooking these "silent" fires, thus ensuring a much more reliable detection capability.

One of the key aspects of our control system is its proactive nature. Given that the operator may not always be 100% focused on monitoring – perhaps due to the duration of missions that may last up to 8 hours – the system is designed to automatically notify the operator in case of fire detection. This means that, even if the operator becomes distracted, the drone continues to vigilantly monitor and promptly alert the operator to any anomalies.

Solar Drone with integrated 4G/LTE Connectivity

In an era characterized by digitization and immediate connectivity, this drone distinguishes itself from market offerings through its advanced integration with 4G/LTE technology. This feature not only enhances the drone's operational capabilities but also significantly extends its range of action, ensuring uninterrupted communication between the drone and its operator.

Onboard the solar drone is a modem with a specialized M2M SIM, engineered to establish a rapid and stable connection with 4G/LTE networks. This integrated connection goes beyond merely providing rudimentary flight data; it enables comprehensive bidirectional communication between the drone and its operational base.

LTE connectivity allows the operator to:

- receive real-time notifications;
- monitor the drone's status;
- alter routes or flight parameters;
- receive live video feed.

Thanks to LTE connectivity, an operator can be thousands of kilometers away and still receive real-time updates and notifications. Whether it's a centralized command center or a mobile team operating in the field, LTE connectivity ensures that all parties remain consistently informed and capable of promptly responding to any situation.

The supplied ultra-portable laptop, also equipped with 4G/LTE connectivity and a dedicated SIM, acts as a redundant controller, adding an extra layer of security in case of issues or malfunctions with the primary Ground Station radio.

GroundStation 2.4GHz

GroundStation 4G/LTE

Take-off and Landing modes

Ease of use is a central concept for the solar drone. The simplicity of the drone's takeoff and landing modes is one of the features most appreciated by simple operators and experts. Both operations are designed to be intuitive, safe, and adaptable to different scenarios, making this drone a complete device, perfect for different operational contexts.

Take-off:
It can be launched with a simple hand gesture. This manual takeoff mode proves particularly advantageous in areas where the environment may not offer a large launching surface, such as mountainous or densely forested areas. With no need for specialized runways or launching ramps, the drone affords significant mobility advantages, allowing teams to quickly move from one point to another and become operational in a matter of minutes.

Landing:
The landing mode has been designed to be equally straightforward and secure. It is equipped with an assisted landing system that, through onboard sensors and dedicated algorithms, allows the wildfire drone to automatically land in a designated area approximately thirty by five meters. If required, the operator can also assume manual control of the drone during the landing phase, ensuring greater precision under difficult conditions.

Design and aerodynamics:
One of the defining features of the solar drone is its ability to operate even under windy conditions or in environments with suboptimal atmospheric variables. The aerodynamic design and advanced control systems enable the drone to maintain a stable trajectory during both takeoff and landing, assuring safe operations even under adverse meteorological conditions.

Technical specifications

Product code:	**23A**
Cruise speed:	40 Km/h
Operating temperature:	-10 / 45 °C
Maximum speed:	70 Km/h
Radio frequency:	2,4-2,483 GHz
Daytime autonomy (cruising speed):	8 hours
Radio range:	10 Km + unlimited (on LTE coverage)
Night range (cruising speed):	2 hours
Operative altitude:	120 m
Maximum altitude:	4000 m
Hourly coverage:	510 ettari (5,1 Km^2)
Wind resistance:	30 knots (56 Km/h)
Maximum daily coverage:	40,8 Km^2

Product code:	**22B**
Cruise speed:	40 Km/h
Operating temperature:	-10 / 45 °C
Maximum speed:	70 Km/h
Radio frequency:	2,4-2,483 GHz
Daytime autonomy (cruising speed):	8 hours
Radio range:	10 Km
Night range (cruising speed):	2 hours
Operative altitude:	120 m
Maximum altitude:	4000 m
Hourly coverage:	510 ettari (5,1 Km^2)
Wind resistance:	30 knots (56 Km/h)
Maximum daily coverage:	40,8 Km^2

Dimensional data

A = 146 cm B = 59cm C = 13 cm D = 32 cm | Weight= 1,18 Kg