iSPEARX↑

INTERCEPTOR UAV

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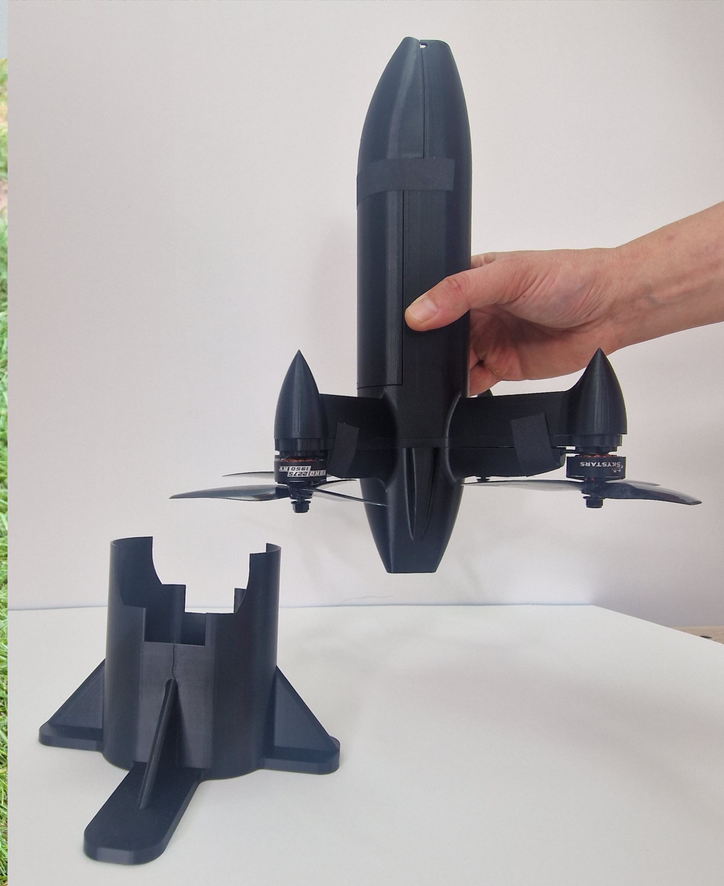
iSpearX first flying prototypes



1. Purpose.

The high-speed kamikaze-interceptor is designed to intercept/destroy various air targets, such as enemy UAVs, reconnaissance drones, and aerostats.

Can be used to implement “small cut tactics” as part of a swarm.

Typical targets

Any low-speed enemy transport and combat vehicles, antennas on land and at sea, enemy infrastructure facilities.

A built-in munition (warhead) can be used to destroy a target, detonating at the moment of contact and/or approach to the target, or kinetic energy.

This solution is quickly adapted to the UGV USV UUV platform.

iSpearX is designed for automatic\semi-automatic launch “surface-to-air” or “surface-to-surface” from any horizontal surface.

It is also possible to launch in the air from the SpearX carrier (a large operational-tactical level UAV).

In this case, **iSpearX** operates on the air-to-air principle.

2. Description.

The high-speed UAV is designed according to the “single X-wing” scheme of high maneuverability.

Propulsion system - equipped with four high-performance electric motors.

Optical system for detection, guidance, capture and pursuit of targets in the visible and invisible ranges.

Two options in the control system - semi-automatic and automatic.

Semi-automatic - the drone operator takes off, searches for a target and captures it - then the drone switches to automatic mode, pursues and destroys the target.

Pursuing the target, the drone changes direction / altitude / speed.

Automatic - after launch, the drone searches for a target using the guidance system and after detection begins pursuing and intercepting the target.

UAV body - combined with the use of structural plastics and industrial fibers and fabrics.

3. Technical specifications

Cruising Speed - up to 190 km/h, operating range 30+ km when flying horizontally.

Maximum Speed - up to 360 km/h, operating range 9+ km when flying horizontally.

Minimum Speed - 60 km/h.

Endurance at cruising speed - 600 seconds.

Endurance at maximum speed - 90 seconds

Payload weight varies depending on the task.

Full weight of the UAV - 3500 grams.

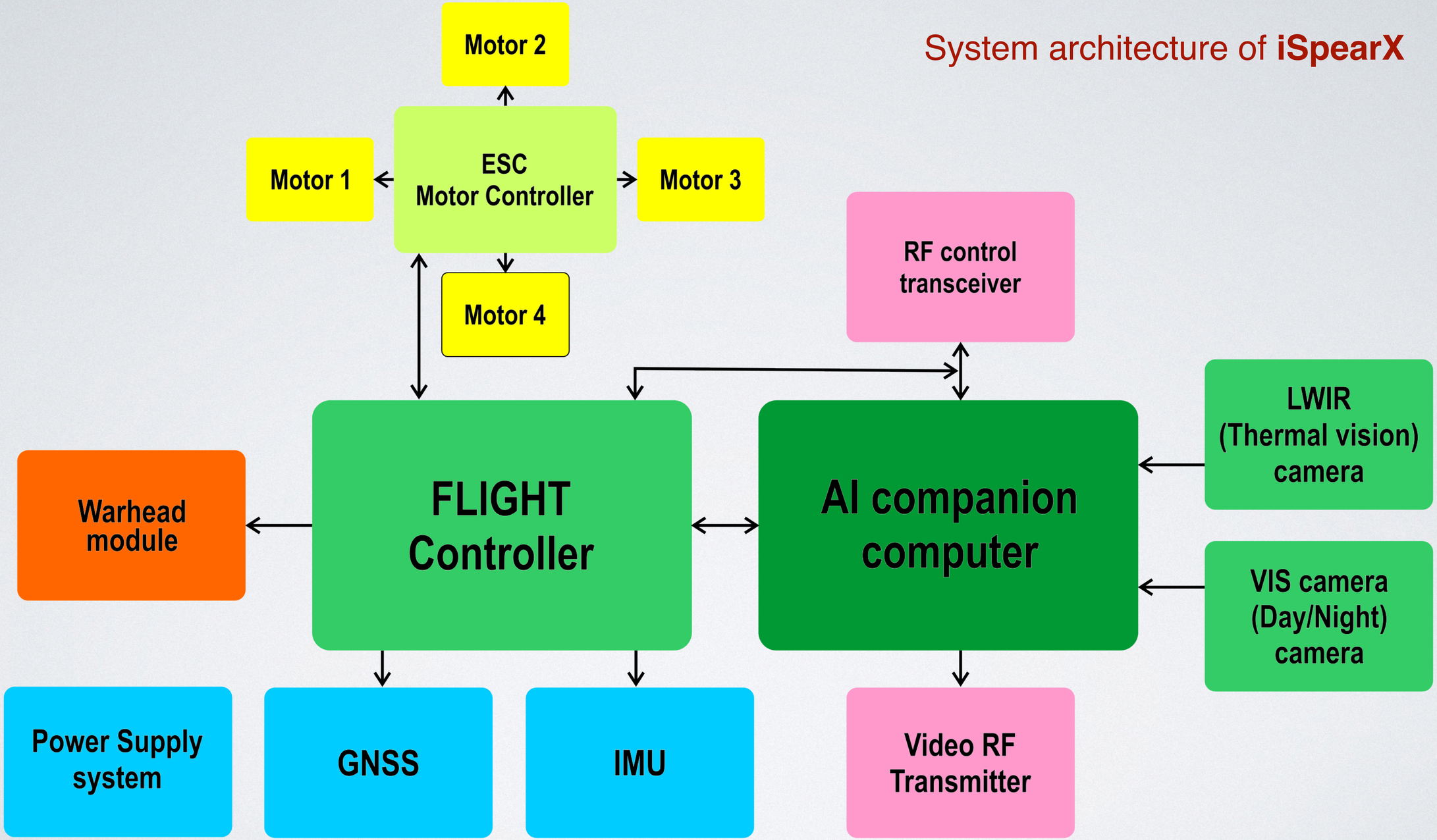
Radio communication radius - 5 km.

iSpearX is resistant to any electronic warfare means and is hidden from electronic reconnaissance means*.

* when UAV is controlled by Edge AI

Note: The next version of the UAV will use a micro jet engine for a short-term acceleration of 10 seconds to 650 km/h.

System architecture of **iSpearX**



4. Architecture and technical description.

4.1 Camera module - consists of two video cameras:

LWIR (Thermal imager)

VIS (CMOS)

4.2 EDGE AI Module. To make independent decisions in autonomous flight, such as detecting, lock-on and pursuing targets.

4.3 Flight Controller.

Designed to control the drone's flight systems (4 engines), based on information from the ground operator and/or AI module.

4.4 GNSS module with support: GPS, GLONASS, Galileo, Baidu.

4.5 IMU module (accelerometer, gyroscope, magnetometer).

4.6 RF control long range transceiver.

4.7 RF video transmitter.

4.8 Power Supply System.

4.9 Electronic Speed for motors Control module.

5.0 Electric motors.

5.1 Warhead module.

5. Dual use potential

Military sector

The main application is an interceptor drone, kamikaze, airborne, ground-based stationary and launched from mobile platforms UGV, USV, UUV.

Possible scenarios

After receiving information about the approximate location of the target, **iSpearX** takes off and heads towards a fast-moving target. At this stage, the drone is controlled by the operator. After visual detection, the operator records the target using the **iSpearOS** software package and transfers control to Edge AI.
Then the flight is controlled by Edge AI, it aims at the target, controls, reaches the target and detonates (and/or performs other actions with the initiation board).
After receiving information about the approximate location of the target, **iSpearX** takes off and heads towards a conditionally static target, such as a repeater, electronic warfare, high-altitude observation drone, artillery fire spotter, antenna - a false target on a meteorological probe (unmanned balloon), etc.
At this stage, the drone is controlled by the operator. After visual detection, the operator records the target using the **iSpearOS (iSpearSoft)** software package and transfers control to Edge AI (onboard artificial intelligence system).
Depending on the modification, for example, in the basic configuration without Edge AI, all the above actions performed by Edge AI are performed by the operator for conditionally static and slowly moving targets.
Then the flight is controlled by Edge AI, it is aimed at the target, controls, reaches the target and detonates (and/or other action with the initiation board).

The fastest possible reduction of the distance with enemy equipment for certain tasks on the battlefield - rapid destruction of ammunition depots, equipment and other targets.
In a certain configuration, partial removal of enemy radars or disabling of enemy energy equipment.
Special configuration - False radio target on the enemy radar. The goal is to deceive and deplete enemy air defense.

Civil Applications

Scenarios

Intercepting drones of intruders without detonating them using kinetic energy. Application at airports or other no-fly zones.

Cloud seeding - artificial precipitation of clouds, artificial induction of rain or snow.

Grounding lightning. In scientific research or observations in specially prepared places, when the time for raising a meteorological balloon is limited.

Rapid delivery of a portable defibrillator AED.

Inspection of pipelines at long distances when it is necessary to conduct a maximum inspection (photo or video flight).

Inspection of roads after natural disasters with a high-speed camera high-speed photo flight.

Inspection of fire sites to understand the direction of fire spread.

6. TRL & Roadmap.

Current TRL 4-6

1. Project of concept
2. Project requirement documents
3. Architecture design
4. System architecture (in parallel) Mechanical architecture
5. Select main components
6. Electronics design (in parallel) mechanic design (in parallel) Software design
7. First prototype production
8. Testing HW, SW, MD
9. Modified HW, SW, MD
10. Second prototype production
11. Testing HW, SW, MD
12. Modified HW, SW, MD
13. Third prototype production
14. Testing HW, SW, MD
15. Modified HW, SW, MD
16. Preproduction batch
17. Testing in real conditions (in Ukraine) (in parallel) NATO codification procedure
18. Mass production
19. Support end-users

7. Business Investment plan for RnD & Mass Production.

Available upon additional request.

Team

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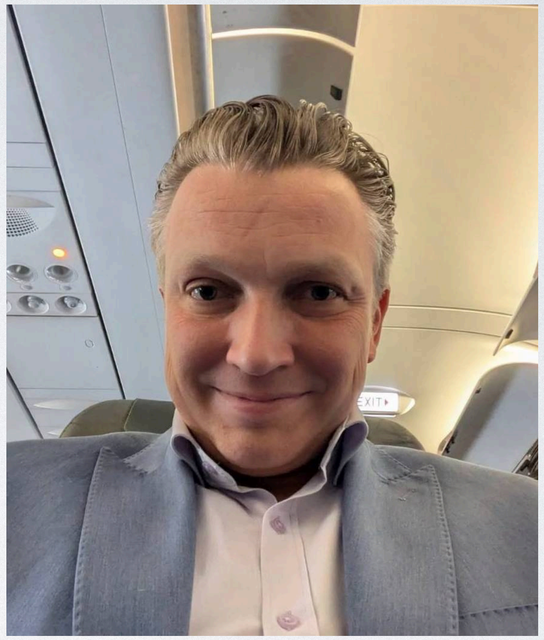
CEO



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