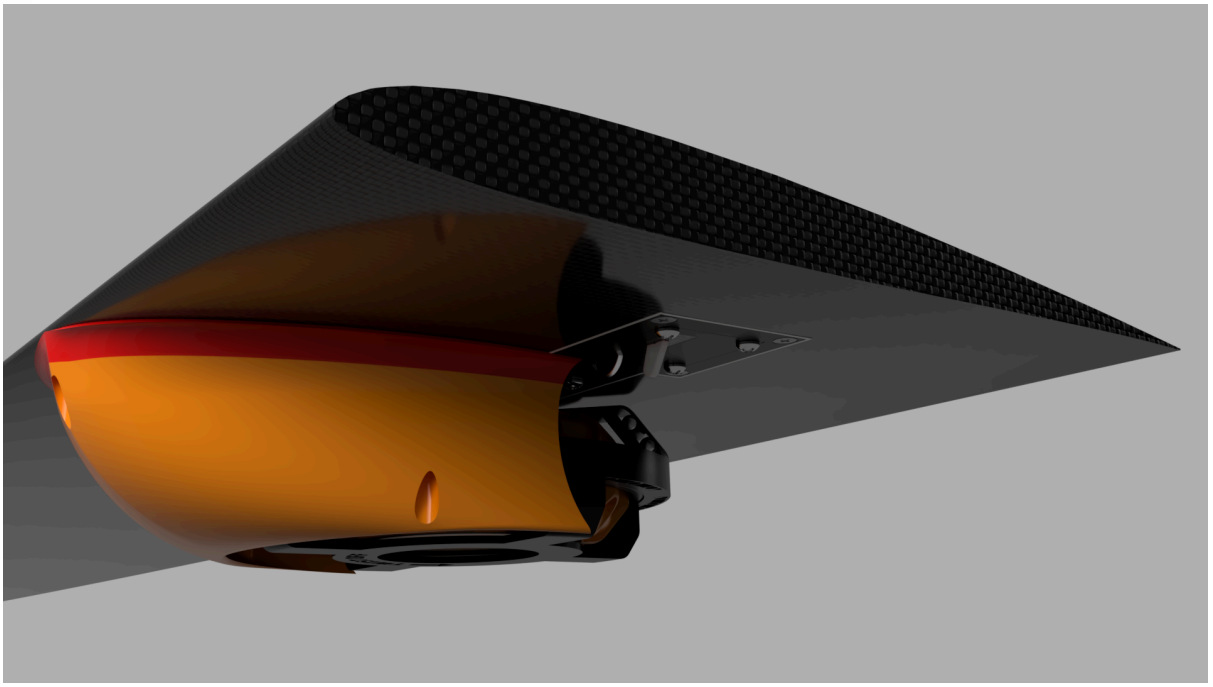
Air Drop Mechanism - How does it work?

Release Mechanism

The release mechanism is based on the KST X06 servo, which, through the movement of its arm, pulls out a pin that locks the payload. Once the pin is released, the payload can drop freely. A spring located inside the mechanism housing ensures the pin returns to its original position. Due to the limited space inside the wing, the construction has been made as flat as possible – its thickness is only 10 mm. The entire unit has been designed as a module that is easy to disassemble, enabling quick servicing and component replacement. The parts of the mechanism were manufactured using 3D printing technology.

Protective Basket

The protective basket serves a dual purpose – it secures the payload during descent and enables its precise release from the drop mechanism. It consists of two parts connected by a thread, which allows for quick and intuitive assembly and disassembly. The lower part of the basket includes clear markings to aid proper use. Landing shock absorption is provided by pads made of a material with good impact energy absorption properties. Additionally, the basket is equipped with a handle for attaching the parachute. The entire basket was produced using 3D printing technology.



Fairing

Due to the relatively large size of the payload in relation to the wingspan and its installation beneath the wings, it was necessary to optimize aerodynamics by using a fairing. It also serves as a compartment for the parachute. The fairing consists of two segments – one part permanently integrated with the wing and another, detachable part secured with screws. This allows for easy access to the interior and facilitates wing transport. As there is no landing gear, the structure has been additionally reinforced. The main body of the fairing was created using 3D printing and reinforced with epoxy resin and fiberglass.

Parachute

The parachute ensures the safe landing of the dropped payload. It is permanently attached to the protective basket. Its specifications – particularly the surface area – were selected based on the payload's weight and the intended descent speed. Before release, the parachute is stored in a compartment located inside the fairing.