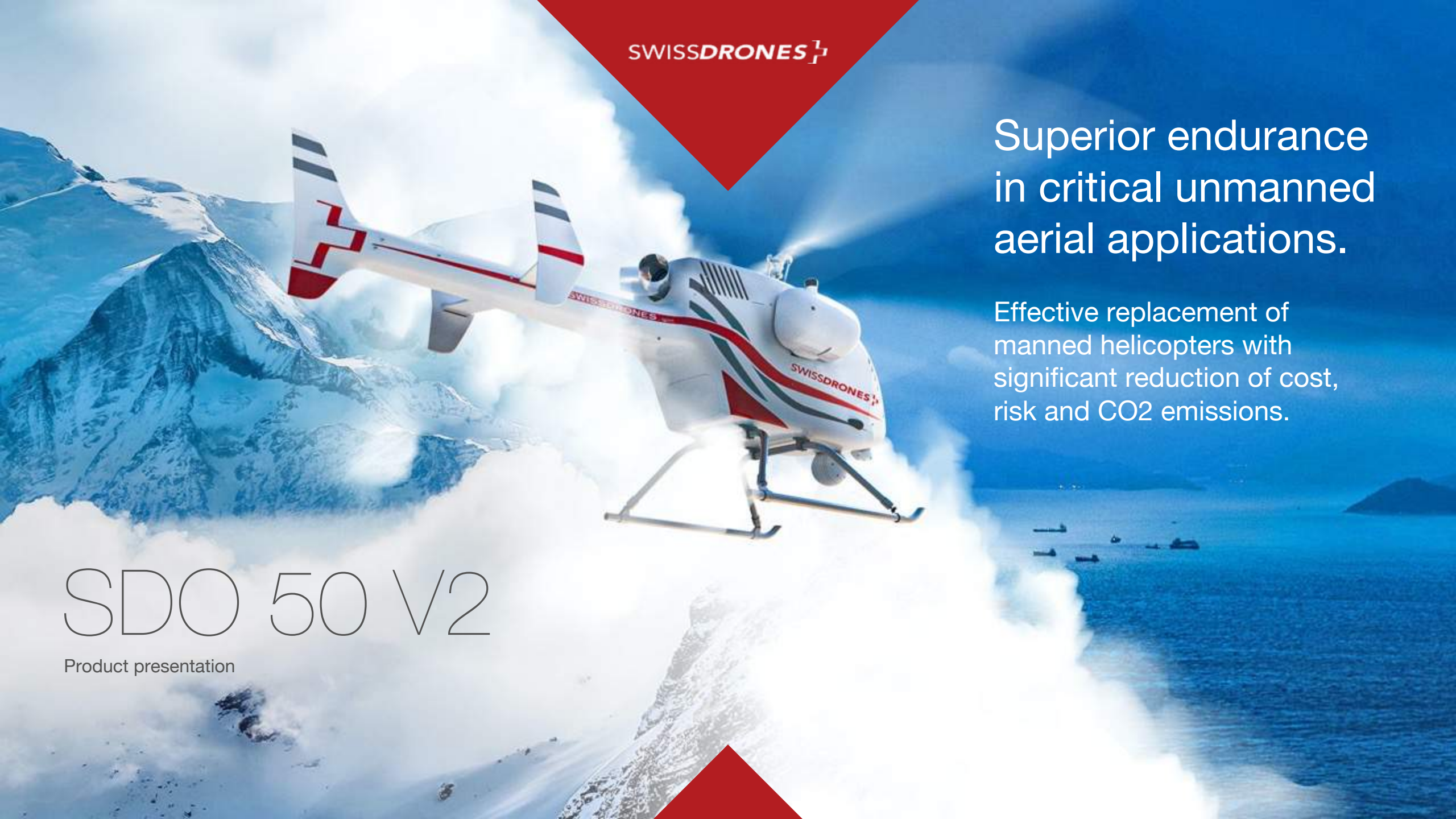
SWISSDRONES



SDO 50 V2

Product presentation

Superior endurance in critical unmanned aerial applications.

Effective replacement of manned helicopters with significant reduction of cost, risk and CO2 emissions.

SDO 50 V2

Superior endurance in critical unmanned aerial applications.

Effective replacement of manned helicopters with significant reduction of cost, risk and CO2 emissions.

Applications

Aerial Surveillance

Unparalleled flexibility and efficiency, allowing for individual payload configurations including stabilized IR/optical cameras and missions under difficult or dangerous circumstances (e.g. bad weather, darkness, flying over hostile or otherwise unsafe areas) when manned operations are not feasible.

Search and Rescue

Agile support of SAR missions using specific camera systems and sensors to locate missing people in inaccessible or hazardous areas (land or water), also in adverse weather conditions and at night. Once target persons are located, emergency gear such as survival kits, medical devices, food, rafts can be airlifted and dropped.

Inspection

Ongoing inspections of critical infrastructure as high-voltage power lines, gas & oil pipel and other far-stretched assets are critical fo uninterrupted operation and security. We c cost-effective unmanned solutions using ma leading cameras, sensors and software t address customer-specific needs for aerial gathering and processing.

Aerial Surveillance

SwissDrones offers unparalleled flexibility and efficiency for aerial surveillance applications, allowing for individual payload configurations including stabilized IR/optical cameras and missions under difficult or dangerous circumstances (e.g. bad weather, darkness, flying over hostile or otherwise unsafe areas) when manned operations are not feasible.

The SDO 50 V2 with its class-leading payload capability allows the user to choose the best camera system for the mission. High payload capacity means you will be able to carry multiple sensors and/or achieve a much longer endurance than most alternative drone platforms available in the market.

A key advantage of the SDO 50 V2 is its ability to collect high resolution videos and imagery, ideally suited for reconnaissance or rapid situational awareness for decision-makers, to track target objects in real-time and to detect, monitor and act upon potential threats from a safe distance.

Search and Rescue

Agile support of SAR missions using specific camera systems and sensors to locate missing people in inaccessible or hazardous areas (land or water), also in adverse weather conditions and at night. Once target persons are located, emergency gear such as survival kits, medical devices, food, rafts can be airlifted and dropped to support their recovery and rescue.

The SDO 50 V2 is also capable of providing real-time data and visual information in case of natural disasters such as wildfires, earthquakes flooding or hurricanes to help first responders and civil protection organizations with better situational awareness.

Inspection

Ongoing inspections of critical infrastructure such as high-voltage power lines, gas & oil pipelines and other far-stretched assets are critical for their uninterrupted operation and security. We offer cost-effective unmanned solutions using market leading high-resolution cameras, sensors and software to address customer-specific needs for aerial data gathering and processing.

The SDO 50 V2 can also be used for environmental monitoring applications including topography & vegetation mapping, detection of exhaust emissions (e.g., sulfur) or nuclear radiation. Further sensor payloads can be integrated for customer-specific use cases.

Key Features

- Missions are possible under difficult or dangerous circumstances (e.g. bad weather, darkness, flying over hostile or otherwise unsafe areas) when manned operations are not feasible
- Cost effective compared to a manned IFR/night VFR airborne solution
- Flight duration up to 3.1 hours and range up to 40 km (BVLOS, extendable), radio line of sight
- Vertical takeoff and landing (VTOL) capability of drone
- Feasible for covered operations due to low noise emission compared to manned systems
- Emergency gear can be airlifted to inaccessible/hazardous places
- System is ground transportable to venue of mission by means of a van or pick-up
- Less skilled operating force required compared to manned systems

Product details

Intermeshing rotor system with proprietary SwissDrones design; High-performing payload ratio; only UAV in the market carrying more than its own weight.

Fully integrated avionics: Output power 28 V 200 W; 12 V 200 W; 7.4 V 200 W

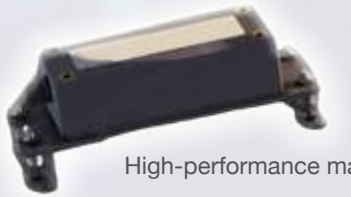
Battery box: Exchangeable.

Auxiliary fuel tanks:
Optional 2 x 4 liters or 2 x 8 liters.

Main auxiliary fuel tank with 13 liters.

High performance jet turbine: Runs on Jet A1; 11 kW power.

High-precision GPS receiver.



High-performance magnetometer.

The SDO 50 V2 uses a proprietary design of the (Anton) Flettner principles of intermeshing double rotor systems (used in their axes in a low angle tilted against each other) allowing for significantly higher payloads and flight stability than conventional systems.

Flettner design

Technical specification

Rotary system:	Flettner double rotor system (4 blades)
Rotor diameter:	2 x 2,82 m
Engine:	High performance turbine
Fuel:	JET A1
Fuel consumption:	Approx. 15 L / hour
Dimension l/w/h:	2,32 m x 0,7 m x 0,92 m
Data link:	40 Km, extendable, radio line of sight
Max. payload:	45 kg (including fuel)
MTOW:	87 kg (including fuel)
Max. fuel capacity:	Main tank 13 L Additional tanks available for longer flying time (2 x 4 L; 2 x 7 L; 2 x 13 L; 2 x 17 L)
Max. flight time:	Up to 3.1 hours
Max. service ceiling:	10,000 ft (3,000 m) AMSL
Max. indicative air speed:	20 m/s (72 km/h)

Ground control station

01 - Bottom front panel (Base unit)
02 - Ventilation grid
03 - Cooling fan
04 - USB 3.0 connector (2x)
05 - Free socket
06 - Main power “on / off“
07 - System test power “on”
08 - System monitor (Touch screen)
09 - Payload key switch 1
10 - Payload key switch 2
11 - Payload key switch 3
12 - Payload push bottom

13 - Payload push bottom 2
14 - Payload analog 1
15 - Payload analog 2
16 - Monitor “on / off”
17 - Monitor “menu”
18 - Monitor “menu selection”
19 - Monitor “enter”
20 - 8.4” monitor
21 - Engine controle switch
22 - Flight control “auto take off”
23 - Flight control “auto landing”
24 - Flight control “manual mode”

SwissDrones provides a state-of-the art ground control station unit and a high-end autopilot, equipped with professional sensors and redundant systems (optional).

25 - Flight control “start mission”
26 - Flight control “return to home”
27 - Flight control “position hold”
28 - 3-axis-stick (e.g. payload)
29 - 3-axis-stick (flight control)
30 - 1-axis control wheel (payload)

31 - 1-axis control wheel (flight)
32 - Keyboard illumination
33 - Mouse with left and right button
34 - 1-axis control wheel (payload)
35 - Lifting knobs for service
36 - Connecting tube to cover

Ground control station

Mission and payload control

Data link / GPS
Terrestrial radio link

Control pilot interface

Weather conditions

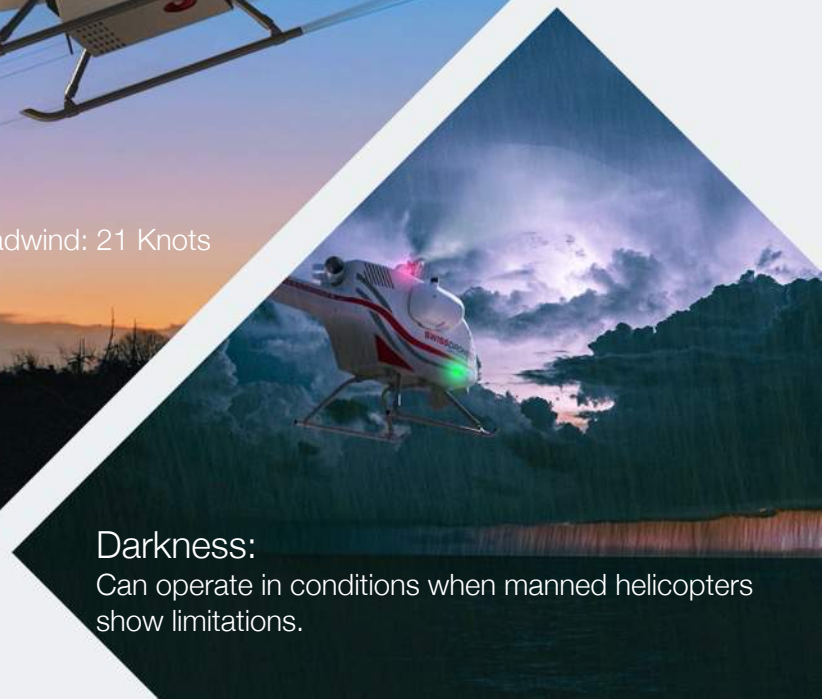
The SDO 50 V2 is made for missions in critical conditions, such as windy, rainy, snowy weather conditions, day and night, at high altitude and a large spectrum of temperatures.

Temperature range:
Min. -10 °C / Max +40 °C

Weather:
Light rain and snow

Wind:
Max. take-off headwind: 21 Knots

Altitude:
10,000 ft in ISA conditions
with reduced GW



Darkness:
Can operate in conditions when manned helicopters show limitations.

Mobile:
15 min set-up by 2-person crew, transported by van or pick-up.

Stationary:
Permanent installation at strategic location.

Maritime:
Take-off and landing on a moving ship.

Hybrid:
Combination of deployment with other fast-response mechanisms such as helicopters.

Operations and mission deployment

The SDO 50 V2 system can be operated as a permanent installation, as part of a ship operation, be made ground transportable to the venue of mission by means of a van or pick-up or be deployed in combination with helicopters.

Sensors

We offer a selected range of high-end sensors already integrated with the SDO 50 V2. Additional payloads can be integrated upon request.

Octopus ISR system

UAV Factory: Epsilon 140/175

Stabilized four-sensor gimbal with MWIR, also including EO, gyro-stabilized gimbal, illuminator and LRF.

LiDAR

RIEGL VUX

Suitable for both corridor and area mapping. Based on VUX-1LR, higher grade NovAtel IMU/GPS, and a 50mp camera. This system is lighter with longer range. LS Micro Vux LR automatically collects highly accurate laser and image data via its on-board system controller.

Aerial Laser Methane Assessment

Pergam: Alma G4 mini

The system is designed for operational diagnostics of extended gas transmission and gas distribution facilities for leaks. It is also used for exploration of gas fields.

Hyper-spectral

Specim AisaKESTREL

The Specim FX10 camera series is designed for industrial and laboratory use. Specim FX10 cameras work in a line-scan mode in the visible and near-infrared (VNIR) area; Specim FX10 in the 400-1000 nm region, and the color optimized Specim FX10c camera in the 400-780 nm region.

Oceanwatch

Overwatch Imaging

The airborne imaging systems help organizations quickly search and find what they are looking for in vast stretches of ocean. It is ideal for long-range boat detection for counter-narcotics, fisheries management and enforcement, and search and rescue spotting.

Radioactive particle detection

Norse Asset Solutions

Equipped with the right sensors, unmanned aerial vehicles (UAVs) can help determine radiation levels after incidents in nuclear facilities as well as during routine monitoring.

Ship integration

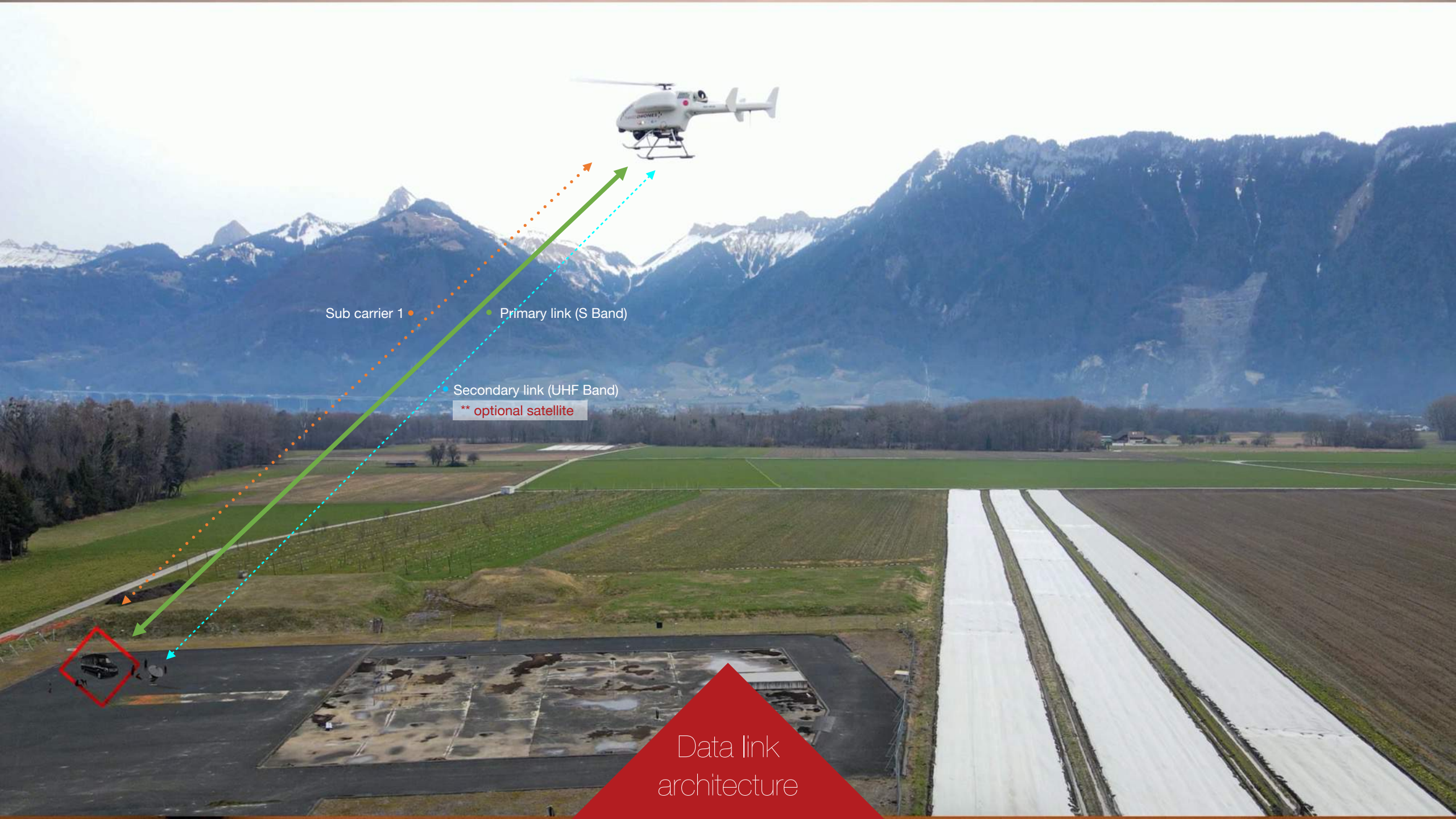
The SDO 50 V2 can be operated on ships for mobile maritime operations for aerial surveillance or search and rescue.

- No requirement for specialized infrastructure
- Integration into ship command system
- Two-man operation
- Small equipment footprint

Maintenance concept

Maintenance schedule

Turbine check	Engine	Every 50 hrs
Turbine pump replacement	Engine	Every 500 hrs
Gear wheel replacement	Mechanical	Every 100 hrs
Gear oil replacement	Mechanical	Every 100 hrs
Actuator replacement	Mechanical	Every 250 hrs
Generator and belt replacement	Mechanical	Every 250 hrs
Avionic box inspection	Electronics	Every 250 hrs
Avionic/ECU batteries replacement	Electrical	Every 250 hrs
SDO-50V2 overhaul at SDO facility	Mechanical	Every 500 hrs
Rotor blades replacement	External	Every 500 hrs
Turbine replacement	Engine	Every 500 hrs



Data link architecture

Enabling unmanned
aerial intelligence

SWISSDRONES