UAVisus S1
Intelligent Aerial Survey System

The UAVisus S1 is a high-performance pure electric vertical takeoff and landing fixed wing Intelligent Aerial Survey System developed by UAVisus Aviatics to meet the application needs of aviation measurement. The whole machine adopts high modulus carbon fiber and PMI composite materials to achieve high impact resistance and lightweight body. It integrates high-precision computing GNSS board, GNSS navigation system, millimeter wave radar, visual perception system, and ultra long-distance data transmission. The core sensors are all redundant backups, ensuring safe and reliable performance. Configured with network RTK/PPK and its fusion computation program, supporting high-precision POS assisted aerial triangulation. Enables 1:500 large-scale mapping capability without control points.

The UAVisus S1 mission payload continues the traditional modular design of UAVisus Aviatics, allowing for tool free replacement of aviation measurement loads. It can quickly respond to tasks such as long-distance and large-area high-precision aerial surveying, real-time 3D modeling, and emergency surveying. Provided an integrated solution for cross industry and cross domain multi-source data acquisition.

Endurance	Control radius	Max takeoff altitude	Max elevation limit	Working temperature	Wind resistance
240min	50km/100km	4500m	7500m	-20℃~55℃	16m/s

System Characteristics Of UAVisus S1

01 Pure Electric Platform

Utilizes a pure electric platform, simplifying operation and maintenance while ensuring high reliability.

02 Distributed Power Management System

Employs an advanced distributed power management system and battery health monitoring system. Batteries can be combined according to the selected payload to improve endurance and ensure flight stability.

03 Multi-Sensor Fusion System

Integrates 2pitot tubes, 2 magnetometers, 2optical ranging radars, 1millimeter-wave laser ranging radar, 3IMUs, 1high-precision differential GNSS module, and 1 navigation GNSS module. This multi-redundancy design enables to complete flight missions safely, stably, and reliably.

04 High Integration, Performance, Reliability

Integrates high-performance sensors such as flight control, IMU, data radio, high-precision differential GNSS board, navigation GNSS module, and millimeter-wave radar, achieving high integration, high performance, and high reliability.

05 One-Stop Software Solution

Supports precise 3D flight path planning, precise terrain-following flight, and real-time 3D flight monitoring; supports the entire workflow of GPS fusion solving, control point measurement, aerial triangulation solving. Supports high-precision integrated navigation trajectory solving, point cloud solving, and point cloud post-processing of the entire LiDAR data processing workflow, provides processing and browsing of various data results such as DOM, DEM, DSM, TDOM, and LAS point clouds.

06 Supports Network RTK and PPK Solving

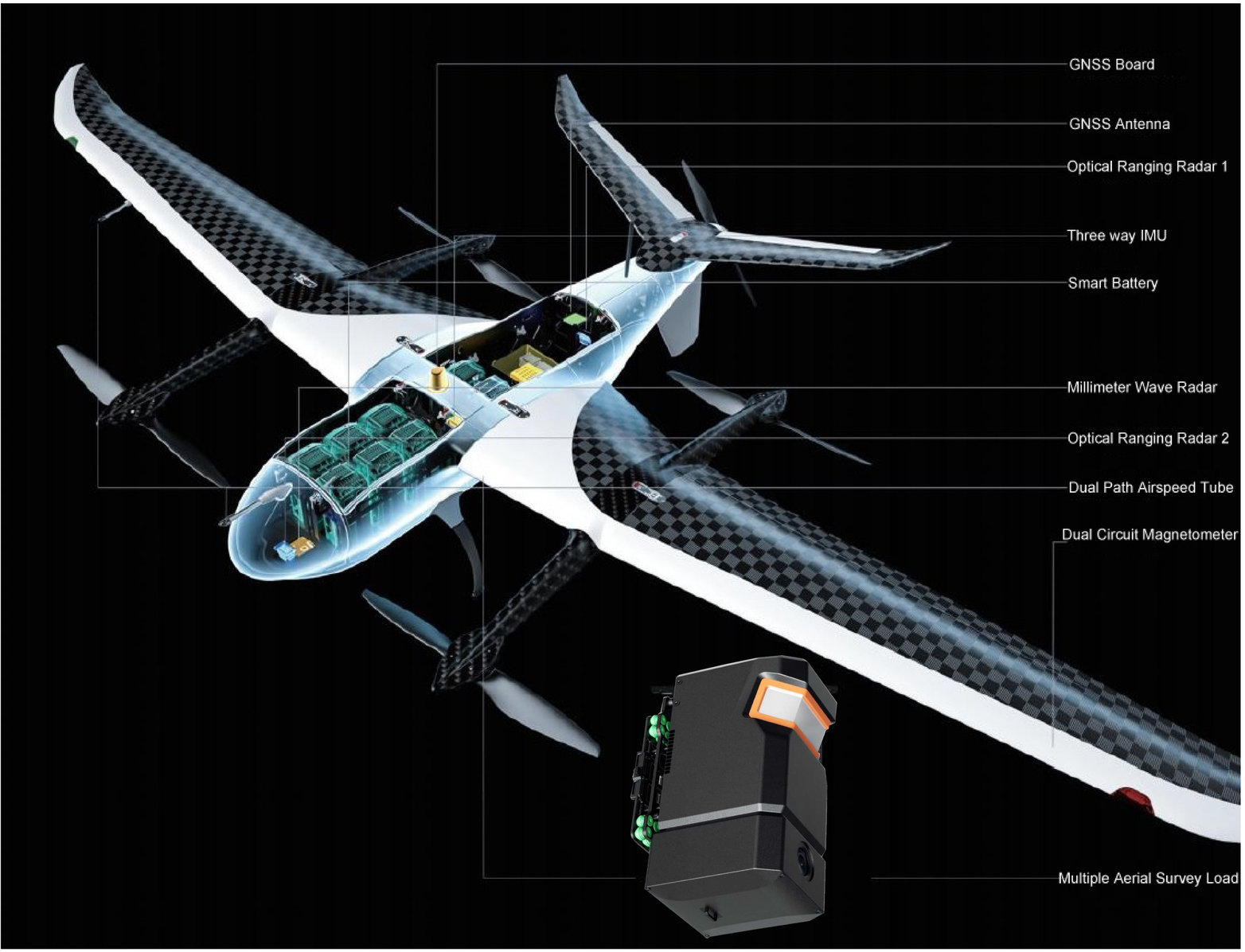
Standard configuration includes highly available and reliable network RTK/PPK and its fusion solving services, adopting an on-demand internet based operation mode to reduce fieldwork workload; equipped with a high-precision differential GNSS board, providing capabilities such as RTK/PPK fusion solving, high-precision POS assisted aerial triangulation, and image control-free mapping.

Sensor failure landing

Lost contact automatic return

Hovering in GPS-denied environment

Power-on self-test



System Composition Of UAVisus S1

Multi sensor redundant fusion system

The S1 adopts a high reliability and high security design. The system integrates 2 airspeed tubes, 2 magnetometers, 2 optical ranging radars, 1 millimeter wave ranging radar, 3 IMU, 1 high-precision operational GNSS module, and 1 navigation GNSS module. Capable of fully monitoring the status of various components of the entire machine.

The redundant design of two optical ranging radars and one millimeter wave ranging radar enables the drone to obtain centimeter level true altitude throughout the entire takeoff and landing process in the event of ranging faults in any one module, thereby achieving safe and stable takeoff and landing. With the help of algorithms outside the true altitude, even if all three altitude measurement modules fail, the drone can still land safely.

Based on redundant design of multiple sensors and fusion algorithm models, flight control data is processed to ensure the speed and accuracy of control instructions, thereby ensuring the accuracy and reliability of drone state information, optimizing aircraft performance, and maximizing flight safety.

Efficient aerodynamic structural design

The S1 adopts a small angle swept wing design, equipped with an efficient power system, and the accounting system operates efficiently. Adopting advanced body structure design and high-precision processing, high modulus carbon fiber is used in combination with NOMAX honeycomb and PMI composite materials to form a high-strength and impact resistant lightweight body.

System design optimization ensures the multi load capability of S1 The lightweight payload design ensures the ultra long endurance of the S1.

Distributed Power Management System

The S1 adopts advanced distributed power management system and battery health monitoring system. The battery can be combined and optimized according to the selected load, thereby improving endurance and ensuring flight stability.

System Configuration Of UAVisus S1

Material	Carbon fiber + paper-based honeycomb + PMI reinforced composite
Wingspan	4150mm
Length/Height	1750 mm / 700 mm
Power mode	Electric
Number of motors	5 pcs
Takeoff weight	24.8 kg
Maximum payload weigh	6kg
Cruising speed	20m/s
Endurance	150 mins @ 6kg payload, 240 mins@ 1kg payload
Take-off and landing method	Fully automatic VTOL
Positioning accuracy	±1 cm+ 1 ppm(H), ± 2 cm+ 1 ppm(V)
Maximum climbing speed in rotor mode	3 m/s
Maximum descent speed in rotor mode	3 m/s
Maximum climbing speed in fixed wing mode	5 m/s
Maximum descent speed in fixed wing mode	3 m/s
Practical elevation limit	7500 m
Wind resistance	16 m/s
Control distance	50 km
Operating temperature	- 20 °C ~ 50 °C
Transport box	Aluminum alloy equipment box with EVA lining box
Task response time	Unfold <10 min, Fold <10 min
Available payloads	Aerial photogrammetry \Oblique\Remote sensing \LiDAR\Synthetic aperture radar

1year or 10000 km quality assurance

Software lifetime free upgrades

On site product usage training

Product delivery test flight acceptance

Available Payloads

Photogrammetric payload V-CAM10

Oblique image payload D-OP4000

LiDAR payload DV-LiDAR15

LiDAR payload DV-LiDAR30

LiDAR payload DV-LiDAR22

LiDAR payload DV-LiDAR40

Introduction for Payload

Photogrammetric payload: V-CAM10

The V-CAM10 photogrammetric payload is paired with a Sony A7R4 full frame camera, and the longer focal length combination can meet the requirements of high-resolution data acquisition in complex environments such as high altitude. Combined with the intelligent route design of the drone butler, it has high-quality side texture acquisition and efficient operation capabilities. The configured full frame mirrorless camera uses the same focal length and parameters for shooting at the same position, resulting in a wider viewing angle than the APS-C frame. By combining with the drone butler data processing module, a complete software and hardware system solution for 1:500 high precision orthophoto aerial photography without control pointcan be provided.

- **Camera model: Sony A7R4**
- **Resolution: 9504 × 6336**
- **Effective pixels: 61million**
- **Pixel size: 3.76μm**
- **Effective sensor area: 35.7mm × 23.8mm**
- **Focal length: 40mm**
- **Working efficiency table**

Flight efficiency table

GSD (cm)	Flight altitude (m)	Working area per flight (km^2)	Working area per day (km^2)	Remark
2	213	15.07	45.22	According to 3 flights per day, 80% × 60% overlap calculation for conventional orthophoto routes.
3	319	22.31	66.94	
5	532	36.42	109.26	
8	851	56.85	170.54	

Oblique image payload: D-OP4000

The D-OP4000 oblique photography payload is paired with a 40mm/56mm lens combination, and the longer focal length combination can meet the requirements of high-resolution data acquisition in complex environments such as high elevation. Combined with the intelligent route design of drone butler, it has high-quality side texture acquisition and efficient operational capabilities. The configured full frame mirrorless camera uses the same focal length and parameters for shooting at the same position, resulting in a wider viewing angle than the APS-C frame. When collecting high-resolution images, faster flight speeds can be used, with the ability to synchronize five cameras for exposure and mark each camera, accurately obtaining accurate exposure position information for each camera. By combining with the drone butler data processing module, a complete software and hardware system solution for 1:500 high-precision tilt aerial photography without camera control can be provided.

- **Camera model SONY A7R4**
- **Sensor size 9504 x 6336 pixels**
- **Effective pixels 305million (61million for each)**
- **Pixel size 3.76μm**
- **Sensor size 35.7mm x 23.8mm**
- **Tilt angle 45˚**
- **Lens focus 40mm fixed focus(nadir), 56mm fixed focus(oblique)**
- **Working efficiency table**

Flight efficiency table

GSD (cm)	Flight altitude (m)	Working area per flight (km2)		Working area per day (km2)		Remark
		Best texture area	Working area	Best texture area	Working area	
2	213	9.10	11.52	30.81	35.13	According to 3 flights per day, 80% × 65% overlap calculation for conventional oblique image routes.
2.5	266	10.99	14.33	37.79	43.80	
3	319	12.77	17.13	44.57	52.44	

Introduction for Payload

LiDAR payload: DV-LiDAR15

Model	DV-LiDAR15
UAVplatform	S1\D20
Typical flight height	100-500m
Max sensing range	2520m@ρ80%
Point frequency	100kpts/s-2000kpts/s (configurable)
Echo mode	16 echoes
FOV	75°(LiDAR) 90°(Camera)
Trajectory accuracy	0.01m(H), 0.02m(V), 0.005°(roll/pitch), 0.0017°(Yaw)
Precision of results	＜5cm @300m
Camera pixel	61 MP
Lens focal length	18 mm
GSD	2.1cm@100m; 4.2cm@200m; 6.3cm@300m
Resolution	9568 x 6380
Storage	Central storage module (256G)
Dimensions	284mm×153mm×175mm
Weight	2.9kg

LiDAR payload: DV-LiDAR30

The DV-LiDAR30 is an airborne LiDAR scanner with an impressive combination of weight, range, accuracy and pulse rate. It is equipped with a unique forward and rear looking FOV designed to minimize laser shadowing and provide geometry on complex vertical structures on a single pass. With its wide field of view of 100 degrees and an extremely fast pulse repetition rate of up to 1.8MHz, the DV-LiDAR30 is perfectly suited for high point density point cloud mapping applications such as power line, Archaeology Mapping and pipeline inspection.

MAX LASER SCANNER SCAN RATE	up to 1,500,000 pts./sec
HORIZONTAL FIELD OF VIEW	100°
ACCURACY	10 mm
PRECISION	5 mm
LASER BEAM DIVERGENCE	0.4 mrad
LASER BEAM FOOTPRINT (GAUSSIAN BEAM DEFINITION)	40 mm @ 100 m, 200 mm @ 500 m, 400 mm @ 1000 m
MAX MEASURING RANGE ρ=20% (ρ=80%)	760 m (1430 m)
SCAN RATE	1800 kHz, up to 15 returns
CAMERA	42 million pixels, 18mm focal length
OPERATING TEMPERATURE	-20°C to 40°C
PROTECTION CLASS	IP64 dust and splash-proof
WEIGHT (including IMU and Camera, approx.)	3.45 kg / 7.6 lbs.
DIMENSIONS (with IMU and Camera, approx.)	384 x 156 x 216 mm

Introduction for Payload

LiDAR payload: DV-LiDAR22

The DV-LIDAR22 tis the new lighter Long Range system designed for the most demanding mapping applications.It is the ultimate combination of high density, long range LiDAR with a powerful 1,550 nm laser and up to 15 returns that penetrate dense vegetation at high speeds and altitudes in large scan regions. This system is available UAV, manned aircraft, mobile, VTOL and backpack configurations.

PLATFORM

OVERALL DIMENSIONS (Sensor)	23.5 x 18.0 x 18.7 cm
OPERATING VOLTAGE	12 - 28 V
POWER CONSUMPTION	90 W
OPERATING TEMPERATURE	-10° - +40° C
WEIGHT (including Nav Box)	4.15 kg / 9.15 lbs.

LIDAR SENSOR

LASER PROPERTIES	1550 nm Class 1 (eye safe)
RANGE MIN	1.5 m at 1 MHz PRR
RANGE MAX	1,000 m at 20% reflectivity, 50 kHz PRR
MAX EFFECTIVE MEASUREMENT RATE	1,500,000 shots/s
HORIZONTAL FIELD OF VIEW	360°
ACCURACY	15 mm one Signma @ 150 m
SENSOR CLASSIFICATION	IP64
WEIGHT	3.5 kg w/o fan
POWER CONSUMPTION	90 W

LiDAR payload: DV-LiDAR40

The DV-LiDAR40 is a lightweight airborne LiDAR with Riegl VUX-240 scanner, especially designed for use on UAS and small manned airplanes or helicopters. With a wide field of view of 75 degrees and an extremely fast data acquisition rate of up to 1.8 MHz, the DV-LiDAR40 is perfectly suited for high point density corridor mapping applications such as power line, railway track and pipeline inspection.

PLATFORM

OVERALL DIMENSIONS (with AIR NavBox)	352 x 164 x 185 mm
OPERATING VOLTAGE	12-28 V DC
POWER CONSUMPTION	75 W
OPERATING TEMPERATURE	-10° - +40° C
WEIGHT (including Air NavBox)	4.7 Kg / 10.4 lbs

LiDAR SENSOR

LASER PROPERTIES	1550 nm
RANGE MIN	5 m
MAX EFFECTIVE MEASUREMENT RATE	up to 1,500,000 meas./sec
HORIZONTAL FIELD OF VIEW	75°
ACCURACY	20 mm
PRECISION	15 mm
LASER BEAM DIVERGENCE	0.35 mrad
LASER BEAM FOOTPRINT (GAUSSIAN BEAM DEFINITION)	35 mm @ 100 m, 175 mm @ 500 m, 350 mm @ 1000 m
MAX MEASURING RANGE ρ 20% (ρ 60%)	1200 m (1900 m)
SENSOR CLASSIFICATION	IP64 dust and splash-proof
WEIGHT	≤ 3.8 kg (without IMU/GNSS)
POWER CONSUMPTION	65 W

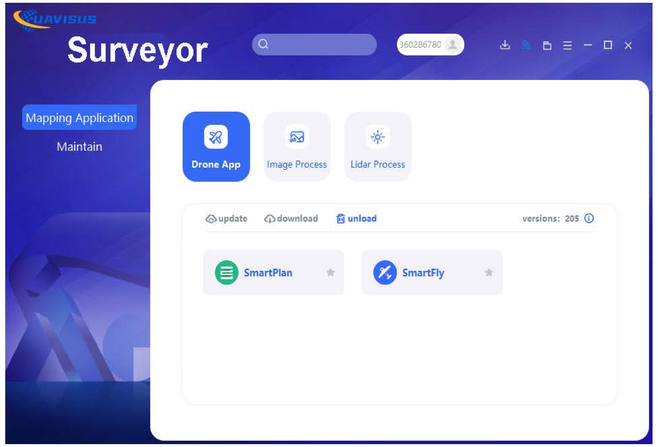
COMPLETE SOFTWARE SOLUTION

Surveyor Professional Mapping Software

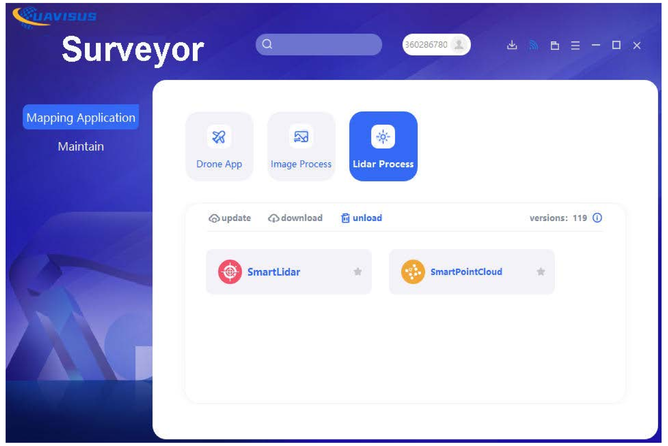
The Surveyor Professional Mapping Software is designed to meet diverse application needs, featuring automatic high-precision flight planning based on real-world 3D terrain data. It supports both fixed-wing and multi-rotor UAV platforms.

The software delivers powerful 2D and 3D reconstruction from RGB imagery, along with integrated LiDAR data processing and point cloud classification. Users can complete LiDAR data reconstruction and classification without any third-party trajectory processing software, efficiently generating multiple GIS-ready outputs.

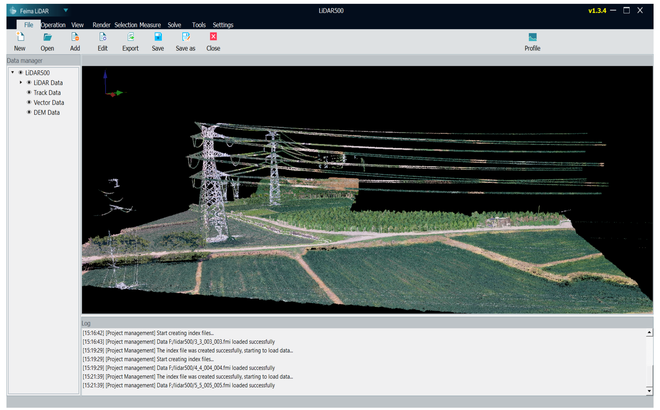
Surveyor Professional Edition is included with the UAV purchase and comes with lifetime free access, delivering long-term value with no recurring software purchase cost.



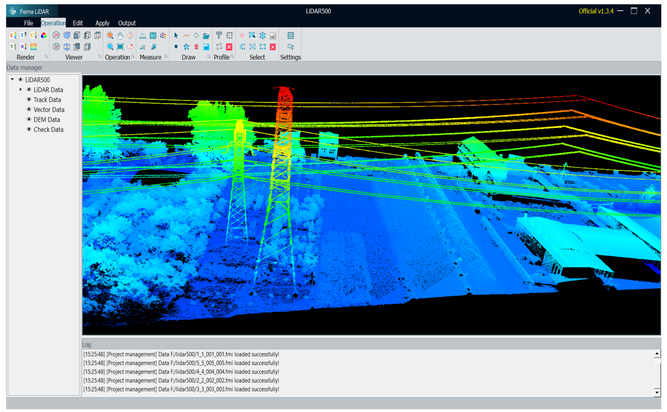
Plan and Fly module



LiDAR data process module



Smart LiDAR module



Smart point cloud module