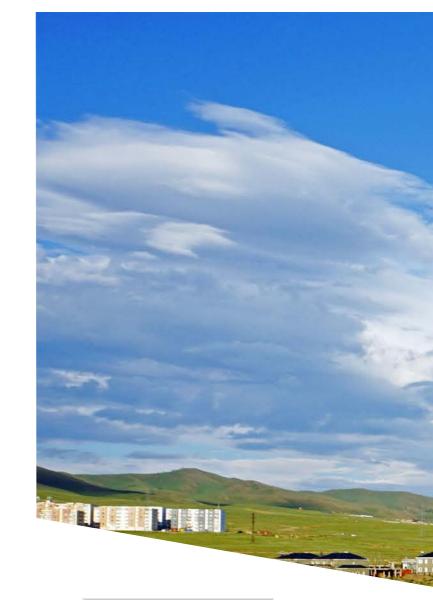
# what surveyors really need...

A professional-level drone made for survey-grade mapping applications...

- 1. Simple assembly and quick hand launch
- 2. Humanized GCS software with interactive interfaces
- 3. Excellent flight attitude due to moderate drone weight
- 4. Quality imageries to generate survey-grade outputs
- 5. Reasonable costs versus high work efficiency
- 6. Trusted local dealer and renowned survey manufacturer standby









large area mapping

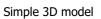
piping planning & inspection

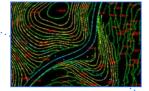












Contour lines



DLG



mining survey

Email: export@kolidainstrument.com http://www.kolidainstrument.com



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S'INY

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heavy earthwork construction



vegetation health survey



**GUANGDONG KOLIDA INSTRUMENT CO., LTD.** 

South Geo-information Industrial Park, No.39 Si Cheng Road, Tian He IBD, Guangzhou 510663, China



A Mapping Drone That Better Understands What Surveyors Need

## **SKY**SOLUTIONS



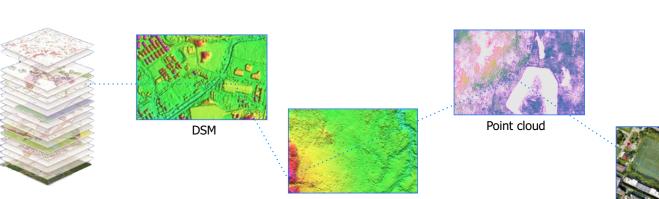
OUTPUTS



# SkyCruiser A20 series understands 100%

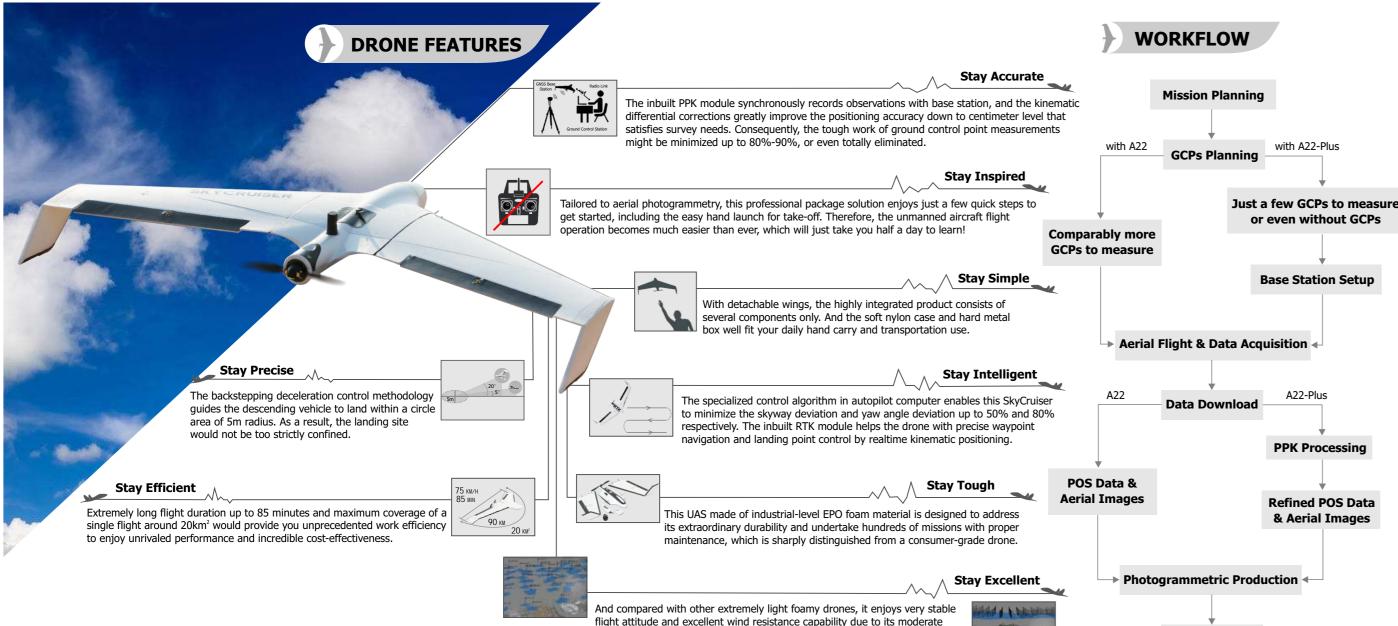
# What shall be considered before purchasing a mapping drone?

1. Easy operation 2. Automated control 3. Output quality 4. Survey-grade demand 5. Cost efficiency 6. Responsive support





Orthomosaic



high precision outputs.

aircraft weight, which brings out extraordinary aerial photography quality and

# MODEL COMPARISON

Model	Standard Version A22	Professional Version A22-Plus	
Inbuilt GPS Sensor	Yes (for aerial positioning, approx. 2-5m accuracy)		
Inbuilt GNSS Receiver	No	Yes (Base Station receiver built in radio datalink device; Rover receiver built in drone fuselage)	
Airborne PPK Mode	No Yes (for refined POS data with PPK difference corrections)		
Airborne RTK Mode	No	Yes (for precise waypoint navigation and landing point control)	
Realtime Skyway Deviation Rectification	No	Yes (managed by specialized control algorithm)	
Imaging Sensor	Sony ILCE-QX1, Exmor APS HD CMOS, 20.1 MP, Voigtlander Lens, E 21 mm, F 2.8		
Data Acquisition	Aerial imageries + original POS data	Aerial imageries + original POS data + base station observations + PPK records	
POS Data Accuracy	Approx. 2-5 m, resulted from original POS data (based on GPS single-point positioning)	Approx. 5-10 cm / 10-30 cm (XY/Z), resulted from refined POS data (based on GNSS RTK aerial positioning + GNSS PPK surveying)	
Survey-grade Mapping	Applicable	Applicable, and more suitable and highly efficient	
Mapping Accuracy	Centimeter level (with sufficient GCPs that are rationally distributed)	Centimeter level (with just a few or even without GCPs)	
GCPs Measurement	More GCPs required for further adjustment to generate precise aerial mapping results	Much fewer GCPs or even no GCP required to generate precise aerial mapping results	
Pre-flight Setup	Regular (approx. 3-5 minutes)	Regular + base station setup (approx. 5-8 minutes)	
Landing Point Control	Deviation controlled within the confined area of 50 m X 4 m (length X width)	Deviation controlled within the confined circle of 5m radius	
Landing Site Clearance	Comparatively bigger Comparatively smaller		

# AREA COVERAGE

Resolution (GSD)	Flight Altitude	Area Coverage (per flight)	Area Coverage (per day)
1.5 cm	70 m	2.0 km <sup>2</sup>	8.0 km <sup>2</sup>
5 cm	235 m	6.1 km <sup>2</sup>	24.4 km <sup>2</sup>
10 cm	470 m	11.8 km <sup>2</sup>	47.2 km <sup>2</sup>
15 cm	760 m	17.6 km <sup>2</sup>	70.4 km <sup>2</sup>
20 cm	940 m	22.2 km <sup>2</sup>	88.8 km <sup>2</sup>

Note: the data shown above is computed according to the forward overlap 75% and side overlap 60% from a 60-minute effective flight for a survey zone with aspect ratio around 2:1. And the area coverage per day results from 4 flights in the same day (2 flights each before and after lunch break). Theoretically, bigger coverage figures are expectable with rational parameter settings and increased flight arrangements.



Outputs

# SPECIFICATIONS

## 

Aircraft Type

Dimensions

Packing Size

Empty Weight

Propulsion System

Autopilot Computer

Airspeedometer

Accelerometer

Magnetometer

Barometer

Gyroscope

GPS Receiver

Body Material

Electric Motor

Model

#### Aircraft System Fixed wing, wingspan 150 cm Standard Version A22 / Professional Version A22-Plus 150 x 70 x 13 cm 98 x 36 x 46 cm (soft carrying case); 98 x 36 x 46 cm (hard transportation box) A22: 1.45 kg; A22-Plus 1.55 kg Industrial EPO foam electric pusher motor, 12-inch foldable propeller 500w Lithium polymer battery, 10000mAh, 14.8V Power Supply

#### Onboard

Integrated RTK/PPK Receiver | Built-in chipset, L1/L2, GNSS (GPS/Glonass/Compass, (for model A22-Plus only) Galileo ready), data refresh baud rate 20 Hz, positioning accuracy up to 3 cm

Automatic take-off, flight and landing operations

3-5 minutes (A22); 5-8 minutes (A22-Plus)

10m/s (36km/h), Beaudfort scale 6, light rain

Frequency Hopping Spread Spectrum (FHSS)

#### Imagery Payload

Standard Camera Sony ILCE-QX1 Sensor Type Exmor APS HD CMOS Resolution Value 20.1 Mega Pixel Lens Configuration Voigtlander Focusing Length E 21mm Aperture Control F2 8 Picture Size 23.2 x 15.4 mm Imaging Resolution | 1.5-20 cm GSD (Ground Sampling Distance)

#### GCS Software

Automated

Automated

Automated

AutoPilot

915 MHZ

-10°C to 45°C

90% condensing

Typical 5-10 km; max. 30 km

Manually controlled

Upon low-battery indication

Three-section algorithm

30%

Pre-flight Checks Flight Automations Camera Triggering Low-battery Warning Auto Return Descending Control Fail-safe Routines Fail-safe Commands

#### **Operation** Performance

Pre-flight Setup Control Mode Weather Limit Operating Temperature Environmental Humidity Radio Datalink Control Frequency Transmitting Power Communication Range

Flight Performance Take-off Type Hand launch/automatic Landing Type Belly landing Typical 20x6 m; recommended 50x10 m Landing Space Endurance Not less than 59 minutes, best up to 80-85 minutes (customized unit only) Effective Photography Duration Best up to approx. 70-75 minutes Range Approx. 80-90 km Cruising Speed Typical 20m/s (72km/h) Flight Height Max. ceiling 4000 m Height above Take-off Location 70-940 m AGL (Above Ground Level) Acquisition Performance Single-point Positioning Accuracy A22: 2m CEP: A22-Plus: 3cm CEP Relative Accuracy (XY/Z) 1-3x/1-5x GSD (A22-Plus) Absolute Accuracy (without GCPs) A22: horizontal 0.8-2m / vertical 1-2.5m; A22-Plus: horizontal down to 3-10cm / vertical down to 5-15cm Absolute Accuracy (with GCPs) A22: horizontal down to 2-3cm / vertical down to 5-10cm A22-Plus: horizontal down to 2-3cm / vertical down to 5-10cm Required GCPs 80%-90% or even all to be eliminated (A22-Plus)

## Mission Planning Simplicity

The ground control software that goes with this solution, very informative and intuitive, helps the user to optimize skyways and generate waypoints by simply defining GSD and overlap percentage.

The software algorithm vividly tells what surveyors really expect: Simplicity and Ease of Use!



# Low-battery Auto Return

Upon low battery warning, the SkyCruiser would activate Auto-Return function itself and ensure an expected safe landing. Once another charged battery is replaced for a second flight, the remained skyway of previous mission would be continued automatically.

# Multi-zone Mission Planning 🛛 🛶

For the flight zone with complicated terrain conditions, a single flight mission consisting of several separate zones might be defined to deal with different flight heights in elevated areas



### Large Area Photogrammetry

When the survey zone is too large to finish within a single flight, you might still keep it as one flight mission. Upon a second flight, the remained survey zone would be followed up automatically without extra flight planning.

## Terrain Condition Evaluation 🚤

If the AGL (Above Ground Level) is less than 50m, the corresponding part of skyway would be displayed in red and users are suggested to adjust the flight height. Flight safety

is the priority in drone operation, which is always acknowledged to both surveyors and GCS.



#### GCS Power-off Protection

In case that the laptop shuts down, restart it or change another laptop and run the GCS, the system would ask you whether to synchronize the existing mission from the aircraft. Even if you fail to restart the GCS, the drone would continue its flight and then land itself.

### Compulsory Checklist Reminder

Before executing the mission, users would be guided to follow some checklists and double check the necessary procedures for flight safety and efficient operation.

In other words, the GCS would always remind surveyors of all proper handlings in order not to make any mistake



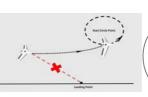
#### One-key Return Home

The one-key operation for quick landing enables the drone to react then return home immediately in case of sudden rain or birds attack, which would effectively decrease the drone crash ratio.

### All-in-one GCS Processing

Instead of operating in a third-party software kit, simply a one-key click in the GCS software will automatically process the PPK records and then

generate the highly precise POS data.



#### Aborting Landing Contingency

Supposed a car stops or some people approach close to the landing point, user can abort this landing for emergency response. The aircraft would switch from landing status to climbing status and fly to start circle point then wait until a better chance for landing comes. Or change another point more suitable for alternative.

### Extraordinary Interaction Experience

A mission information preview before flight and a prompt message asking whether to download POS after

flight instantly appear, which all contributes to your master control of the aerial survey job.













