



GDU | SAGA

In Flight, Day and Night

-FORESTRY-

CONTENT

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SAGA

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CASE STUDIES

GDU

H 420m
vs 2.5m/s

-CORE TECHNOLOGY-

Single Chip
Integration
Technology

Intelligent
Control
Technology

Military
Frequency-
hopping
Anti-interference
Technology

Fully
Independent
R&D of Infrared
Technology

01 ABOUT SAGA



Foldable
Portability



Intelligent
Control



Obstacle
Avoidance



Compatible
Universal Payload



7KM HD
Video Transmission



Open
SDK



Max Take-off
Weight



Vision Positioning
System

Description	Parameters
Model	GDU SAGA
Dimensions (Unfolded)	745mm×555mm×225mm
Dimensions (Folded)	273mm×224mm×107mm
Maximum Take-off Weight	3.4kg
Maximum Load	1kg
Maximum Horizontal Flight Speed	15m/s (Sport Mode)
Maximum Flight Altitude	3500m
Maximum Tolerable Wind Speed	10m/s
Maximum Flight Time	35 minutes
Satellite Positioning Module	GPS/GLONASS Dual Mode
Hover Accuracy (P-GPS)	Vertical : ±0.5m (Downward Vision System : ±0.1m) Horizontal : ±1.5m (Downward Vision System : ±0.3m)
Video Transmission and Flight Control Distance	7KM



PAYLOADS



800X600
Infrared Camera



Floodlight with
Camera



Gas Detector with
Camera



Megaphone with
Camera



4K HD Camera
(Optional)



10X Optical
Zoom
Camera(Optional)



30X Optical
Zoom
Camera(Optional)

800X600 Infrared Camera (GTIR800)



Features

1. 800X600@50Hz infrared dual light
2. NETD 30mk or less
3. High precision temperature measurement
4. Multiple lens adaptation
5. Visible light/ infrared video switching

Floodlight with Camera (GISL01)



Features

1. Effective range 500m; Maximum brightness 3000lm
2. Photo resolution: 1920*1080;
3. Video resolution: 1920*1080
4. Operating temperature: -20°C ~ 50°C; Storage temperature: -40°C ~ 60°C
4. Operating humidity: 15% -90% RH (no condensation)

Gas Detector with Camera (GIGD01)



Features

1. Type Detection Range

NO₂ (0-20) ppm, 0.1ppm; CO (0-1000)ppm, 1ppm

SO₂ (0-20) ppm, 0.1ppm; O₃ (0-20) ppm, 0.1ppm

H₂S (0-100)ppm, 1ppm; CH₄ 0-100%LEL, 1% (Optional)

PM_{2.5} ≥2.5μ m, 0-1000ug/m³, ±15% (Optional)

2. Relative Humidity 0~100%RH, ±3%RH

3. Temperature Measurement Accuracy -40~125°C, ±0.3°C

4. Photo&Video resolution: 1920*1080

Megaphone with Camera (GISPK01)



Features

1. Effective range 300m;
2. Sound range 55-60 decibels 100 meters away, 120 decibels maximum.
3. Sound transfer range 5km
4. Photo&Video resolution: 1920*1080
5. Sound notifications Police, Fire, Car horn, Real time voice intercom

4K HD Camera (QYT003) (Optional)



Features

- 1: 12.4 million effective pixels;
- 2: Equivalent focal length 24mm;
- 3: 4K@30fp HD video, 12 million pixels HD photo;
- 4: 3-axis stabilization, image stabilization precision $\leq 0.03^\circ$;
- 5: Optional wiring box, supporting SBUS, PWM, serial port control interface.

10X Optical Zoom Camera (GTZMHD-10X) (Optional)



Features

- 1: 10x optical zoom, 4x digital zoom, zoom range 4.7-47mm;
- 2: 12.4 million effective pixels SONY CMOS;
- 3: 4K@30fps HD video, 12 million pixels HD photo;
- 4: Fully automatic focusing, supporting fine tune focus;
- 5: 3-axis stabilization, image stabilization precision $\leq 0.01^\circ$;
- 6: Optional wiring box, supporting SBUS, PWM, serial port control interface.

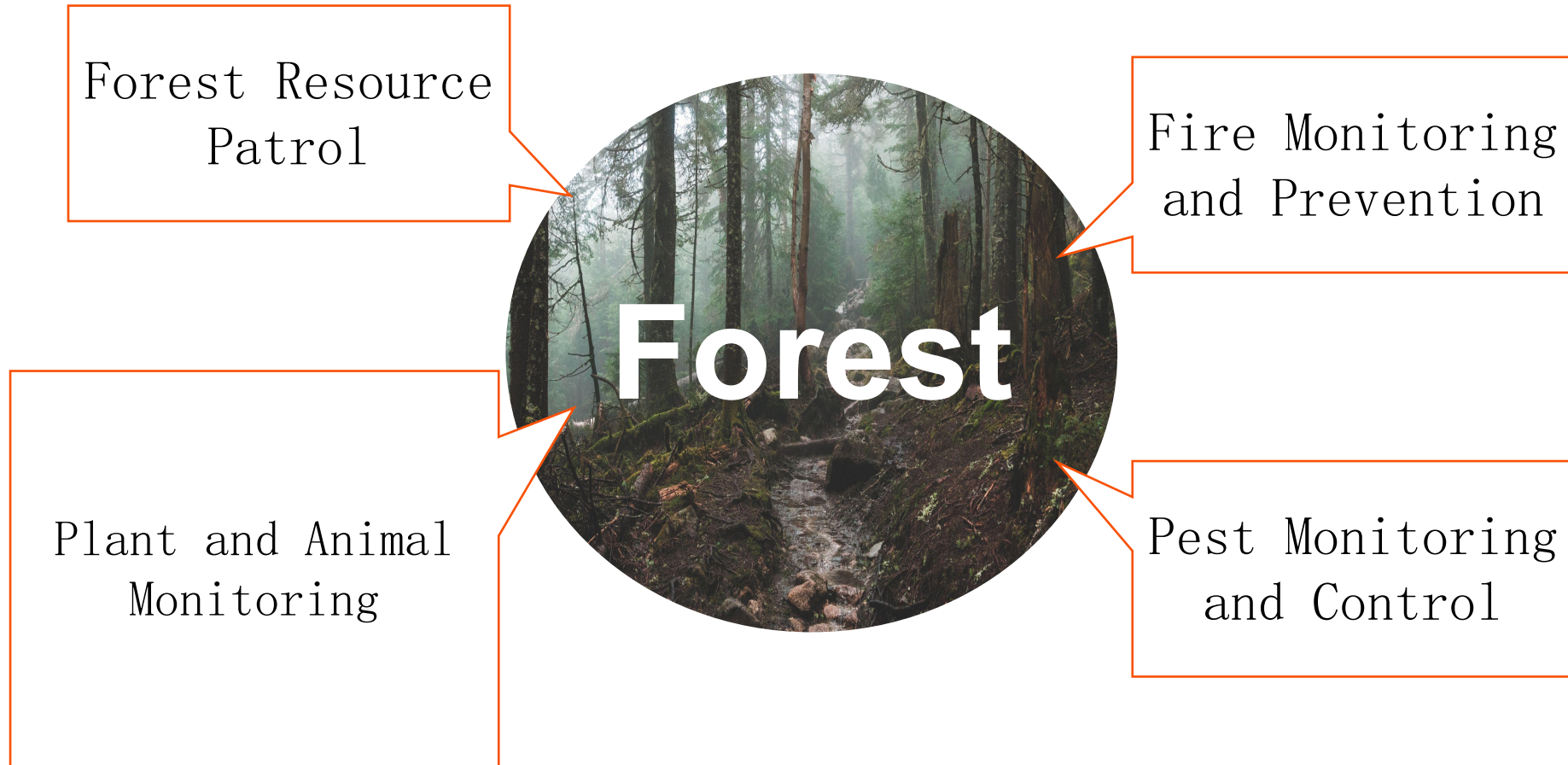
30X Optical Zoom Camera (GTZMHD-30X) (Optional)



Features

- 1: 30X optical zoom, 4X digital zoom, zoom range of 6~180mm;
- 2: 12.4 million effective pixels SONY CMOS;
- 3: 4K@30fps HD video, 12 million pixels HD photo;
- 4: Fully automatic focusing, supporting fine tune focus;
- 5: 3-axis stabilization, image stabilization precision $\leq 0.01^\circ$;
- 6: Optional wiring box, supporting SBUS, PWM, serial port control interface.

02 SAGA FORESTRY APPLICATIONS



Features of SAGA Applications in Forestry

- High wind resistance, few environmental limitations,
no blind spots
- Less work time and higher efficiency
- Stable aerial photography equipment
- Thermal imaging camera can obtain accurate data at
night or through smoke
- Real-time video transmission, instantaneous
feedback

Advantages of SAGA Applications in Forestry

Index	Satellites	Aircrafts	SAGA	Probes
Cost	Moderate	High cost, need to lease aircrafts, aerial cameras, airport and other facilities	Low cost, one-time purchase, worry-free	The cost is low but the quantity demanded is large
Efficiency	Very low efficiency, images and data collection are time consuming	Average efficiency, greatly affected by the weather and greatly regulated by civil aviation	High efficiency, low flight altitude, little control by civil aviation	High efficiency but need to distribute probes by region
Real-time	---	Flight missions are reported in advance and requires 6 hours for preparation	Always on standby, urgent tasks can be started in a few minutes	All-weather operation
Practicality	----	----	Different payloads can be equipped to complete a variety of tasks, such as pesticide spraying	----
Controllability	Uncontrollable	Low controllability. Pilot operated and fixed route	High controllability. After training, the ground station can be used to control the UAV's flight	Low controllability limited by fixed working platform with the probe angle only able to be rotated in place
Accuracy	Low accuracy, currently only supports a resolution less than 50cm	High accuracy, supports a resolution ranging from 5-50cm	High accuracy, supports a resolution ranging from 3-50cm	----



Disaster Monitoring

- Fire protection
- Post-disaster assessment
- Pest control



Resource Survey

- Resource Monitoring



UAV Inspection

- Animal monitoring and tracking
- Vegetation monitoring
- Logging monitoring



Command Center

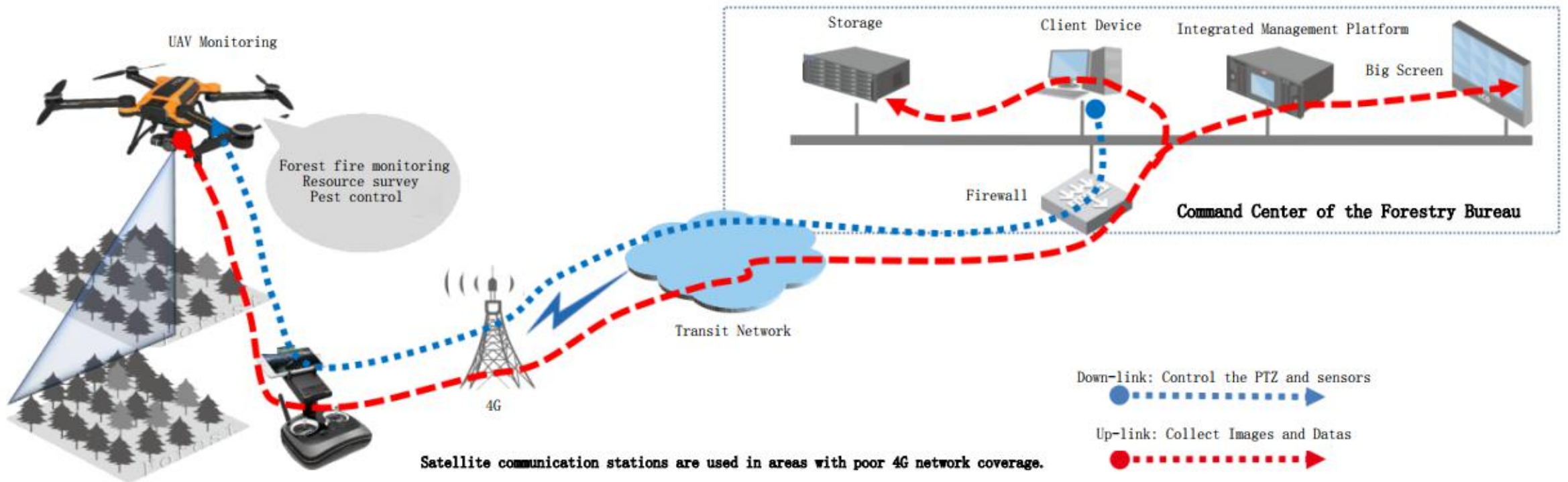
- Real time monitoring
- Patrol task scheduling

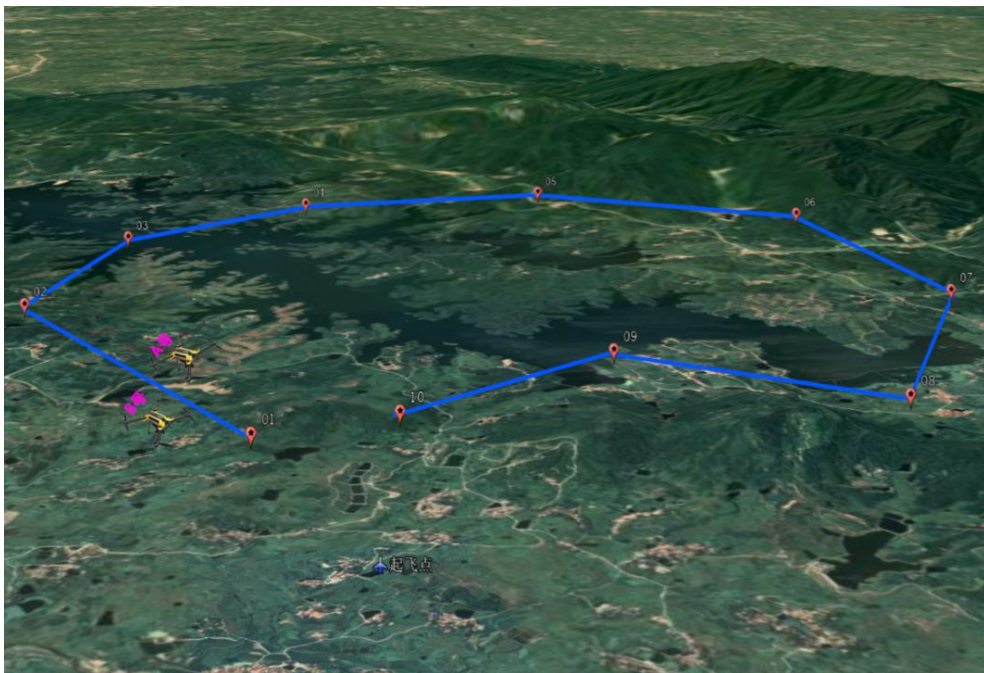
A black and orange drone is flying in the center of the frame, surrounded by a heavy shower of rain. In the background, a person on the left is holding a smartphone to capture a photo or video of the drone. On the right, another person is holding a white plate high in the air. The scene is set outdoors with trees and a building visible in the blurred background.

03 SAGA Solutions & Case Studies

GDU SAGA-An Integrated Forest Management UAV System

- Main function: forest fire monitoring, forest resource survey and pest control;
- Key technologies: automatic route planning, combined with GPS technology, digital video transmission technology and other high-tech integrated applications in forest resource management;
- Results-oriented: currently focused on solving fire prevention and ground patrol issues but cannot take into account early remote forest fire detection problems and quantitative calculations of forest changes.





Route Planning Patrol

- On the App, mountain patrol and forest protection routes can be planned in advance. When SAGA takes off, it will patrol and protect the forest according to the planned route. The staff only needs to check the real-time video transmitted on the App.
- After arriving at the designated point, SAGA can carry out panoramic shooting and other specific tasks;
- If abnormalities are found, SAGA can stop the flight path at any time, close to the area in question.
- When equipped with an infrared camera, the App can set the temperature abnormality range. When the infrared camera detects abnormal temperatures, it will immediately report to the command center and alert the staff of the situation detected by the App.
- The planning path file supports sharing and editing. During patrols, SAGA is equipped with infrared and visible light cameras to carry out tasks at different heights. When infrared anomalies are found, the positions are located and detailed information is obtained by the device.

SOLUTIONS — Fire Prevention



Area Calculation

SAGA, equipped with a 30X optical zoom camera, will have automatic white balance (AWB), automatic gain, and automatic color correction. High definition and multi-angle video data can be obtained remotely without shaking. The fire area can be calculated according to the data transmitted by SAGA.

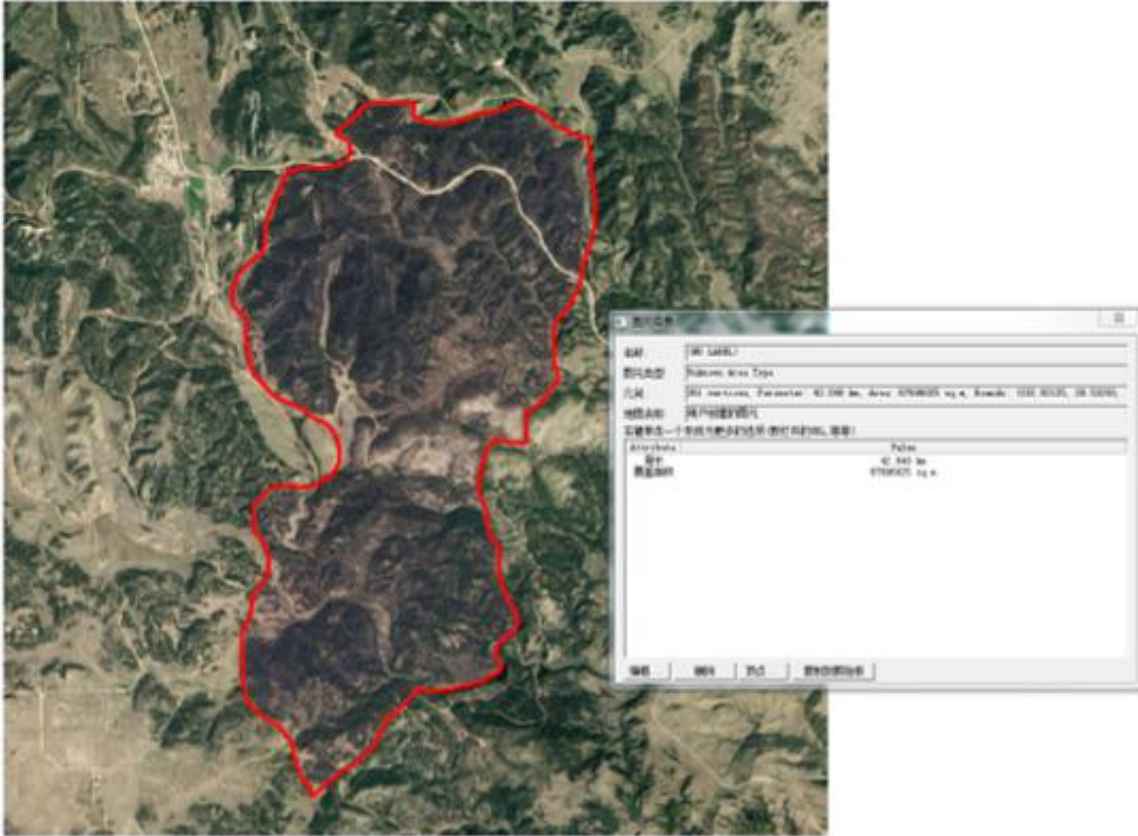
SOLUTIONS — Fire Prevention



Rescue Assistance

1. An Integrated megaphone can transmit and convey instructions which is more effective to direct those on the ground.
2. Use SAGA to assist rope throwing or carry key equipment (such as a breathing apparatus) to open up a life-saving passage.
3. SAGA can be used for communication relays. For example, in an environment where communication is blocked, the integrated relay module for SAGA can be used to serve as a temporary relay station, so as to establish wireless communication links in these extreme environments.
4. SAGA's integrated aerial photography module is used for surveying and mapping to collect all the information of a disaster or accident site and transmit it to the command center, so as to conduct emergency terrain mapping and provide strong support for rescue operations.

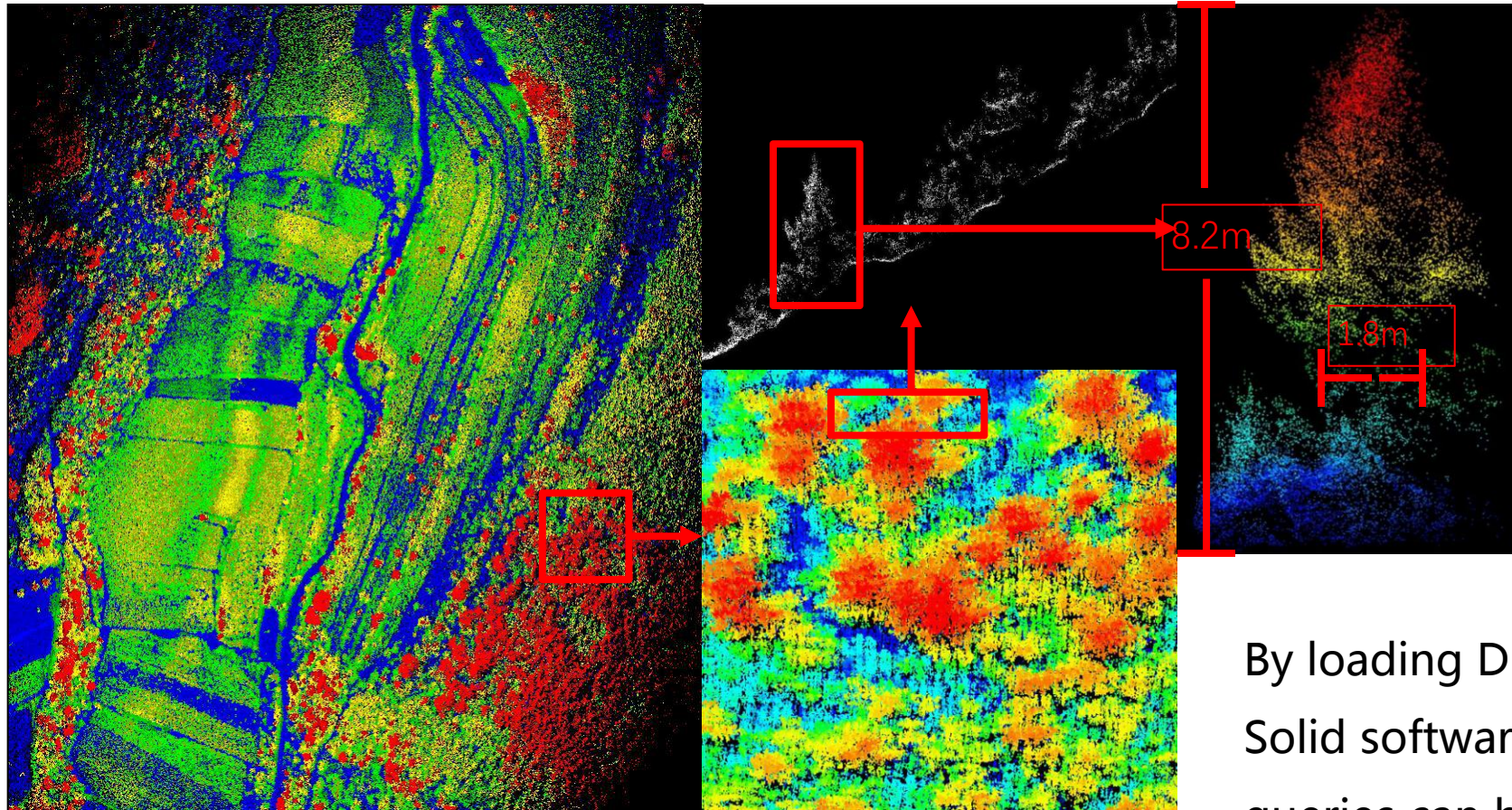
SOLUTIONS — Fire Prevention



Post-disaster Assessment

- Plan a route in the area on the App and obtain image data through SAGA' s automation;
- Image data is processed by professional software to generate an orthophoto image (DOM);
- Staff can directly calculate the post-disaster area and other information on the image map;

Forest Resource Estimation



By loading DEM data in Terra Solid software, various attribute queries can be performed.

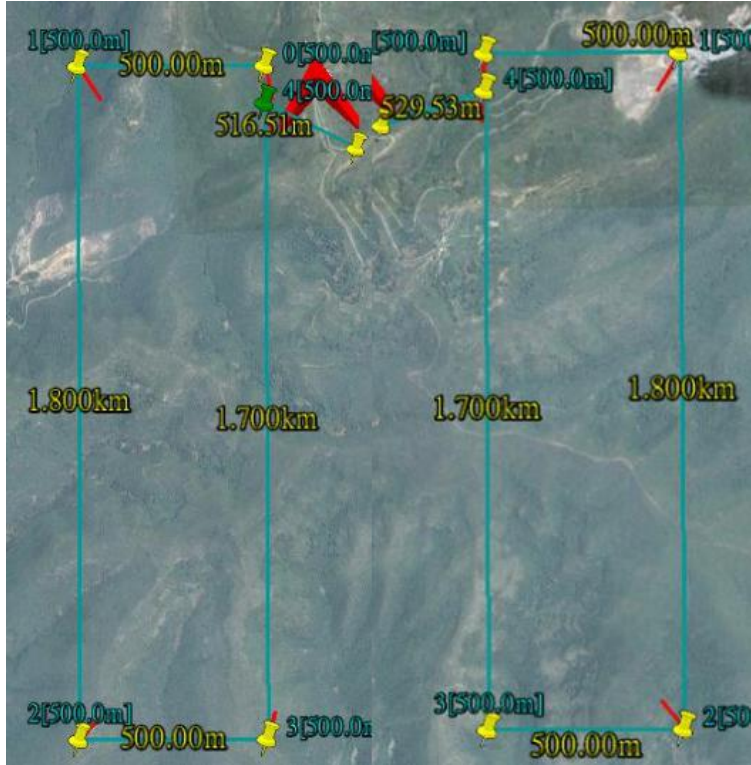
SOLUTIONS—Resource Survey



With HD optics, SAGA can survey vegetation and monitor trees to prevent illegal activities such as logging and jungle reconstruction.

Vegetation Monitoring

SOLUTIONS—Resource Survey



Equipped with an HD optical camera, GDU SAGA can plan a flight path, and collect resource distribution data.

Resource Monitoring & Measurement

SOLUTIONS——Wildlife Monitoring



HD Zoom Camera Monitors Wildlife Status

Under normal circumstances, HD scanning and shooting by SAGA can be carried out in key areas of wildlife activity, such as migration, breeding, and hibernation, so as to obtain high-resolution aerial image data, affirm resource quantity, and eco-status of wild animals.

SOLUTIONS——Wildlife Monitoring



Pest Control

- SAGA' s remote sensing data collection is also supplemented by satellite and manned aerial remote sensing. According to data analysis results, targeted manual ground inspection is conducted to ensure the coverage accuracy of forest pest detection and reporting, while improving the working efficiency.
- SAGA will regularly acquire woodland data and generates DOM data after processing. DOM data is used to monitor the discoloration abnormalities of trees. Dead trees, discolored trees, and abnormal trees can be located by using high-precision remote sensing images and GIS information. This can clearly distinguish the effects of diseases and insects.
- Verification, supervision, and fine management. Remote sensing technology is used to monitor forest growth rapidly and with high precision. First-hand information is obtained so as to monitor and control the situation and keep track of forest growth.

Command Center

- The command center can view the use of every SAGA and the interface can arbitrarily switch to the real-time screens of each SAGA in use.
- The command center can clearly see the work of each SAGA in a divided area and schedule every SAGA according to their actual use.



SAGA Case Study

1

GDU SAGA Forestry Protection Application Case

Client: Forestry Bureau

Background:

The Forestry Bureau provides rescue operations for accidental fires for nationally protected forests. When the situation is urgent, there is a need for on-site early warning and detection. The timely command and dispatch, the protection of trees and vegetation, as well as property and personnel safety are all under the responsibility of the Forestry Bureau.

Necessity :

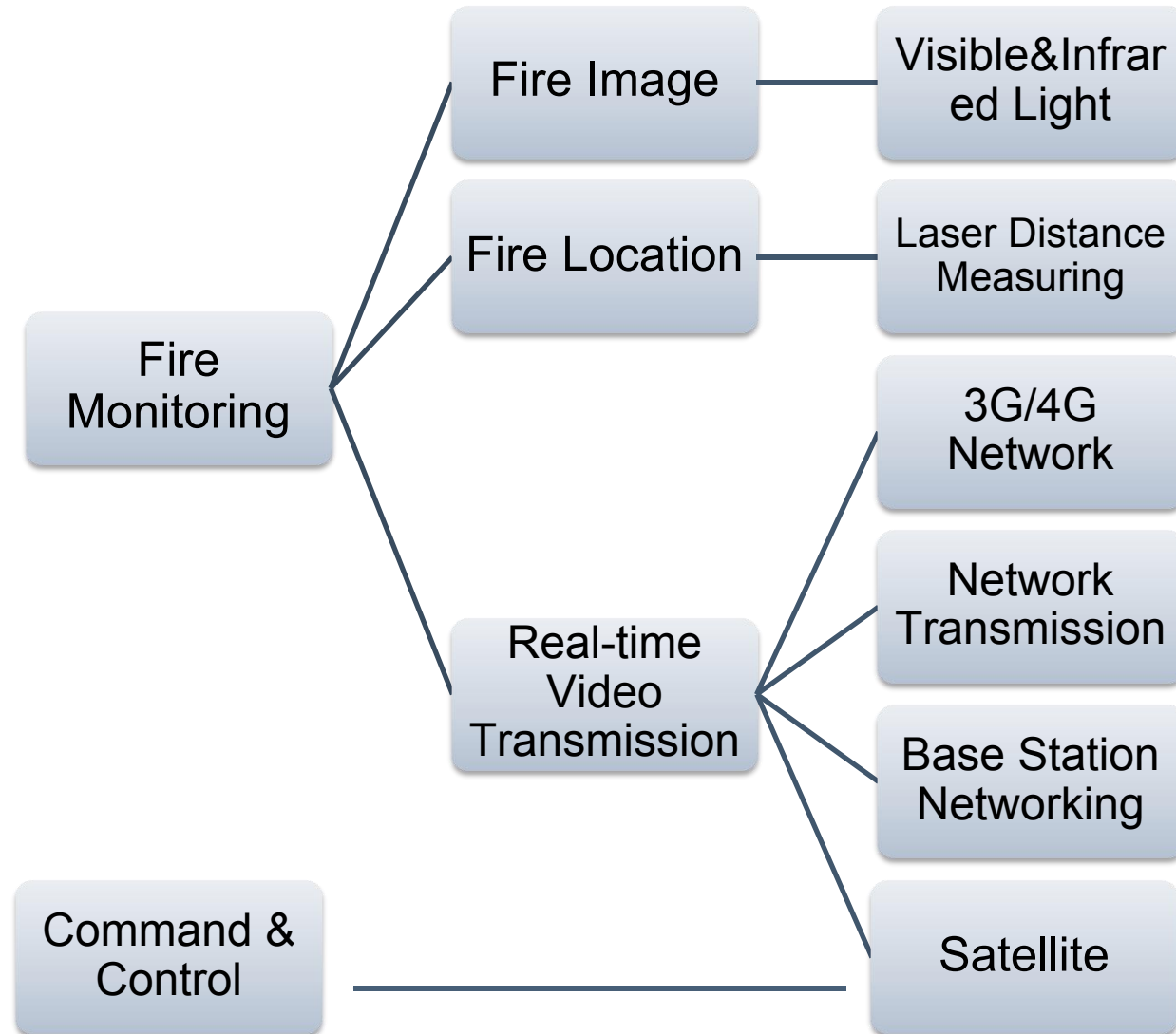
SAGA can replace traditional methods of labor. Applications, technology, and system solutions for SAGA combined with video, infrared monitoring, and transmission equipment can all increase the efficiency and safety of any job such as navigating complex terrain in air patrols, on-site rescue command, and fire detection and control.

UAV System : The GDU SAGA

Payload : 4K , Infrared , 30X

Content : Real-time monitoring, day and night patrol, aerial forensics. With the technical characteristics of rapid maneuvering, the low cost of use, and simple maintenance, SAGA has the ability to quickly monitor the forests. And SAGA can effectively inspect each area by mounting an infrared camera. During a fire rescue operation, the accurate assurance and timely understanding of various dynamic information of a forest fire can be used at night and also solve problems in low visibility situations caused by smoke.

Fire Monitoring Process



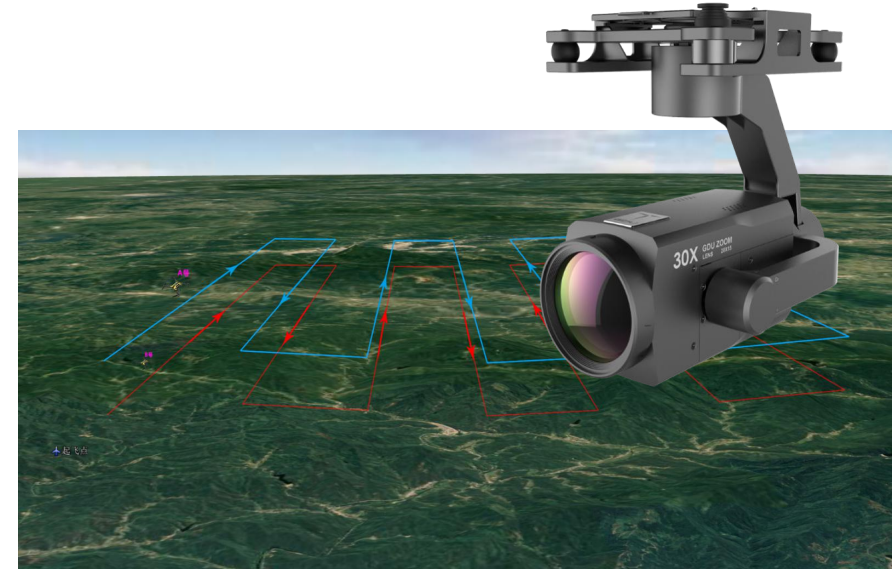
SAGA Case Study

1



Thermal Imaging

- Under conditions of dense smoke, infrared thermal imaging can find the location of a fire according to the temperature differences and will instantaneously provide feedback and detailed data to the command center.
- **Advantages :** No blind spots, accurate, timely feedback



Route Planning & 30X Optical Zoom Camera

- The command center can prepare regional routes for inspection and disaster identification. It can provide accurate fire information for the changes in direction so that staff at all levels can understand the dynamic situation and make timely decisions to minimize losses.
- **Advantages :** Fast maneuvering, low cost, night flight

GDU SAGA Aids an Overseas Forest Bureau to Increase Forest Greening Rate

Client : Forestry Bureau

Main Purpose : Forest protection, general forest inspection

Platform : GDU SAGA + 4K camera

Main Functions : Upload to data server, picture stitching, task planning

Project Background : A country is a tourist destination. It should actively engage in environmental and forest protection, take initiative in producing forest maps, and update old data. If the appropriate updates are made in real-time, there will be no deforestation, illegal buildings, forest fires or other various environmental issues.

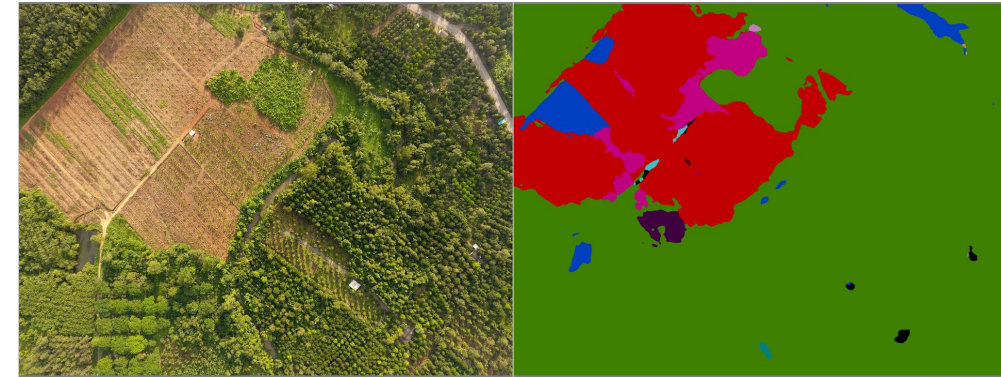
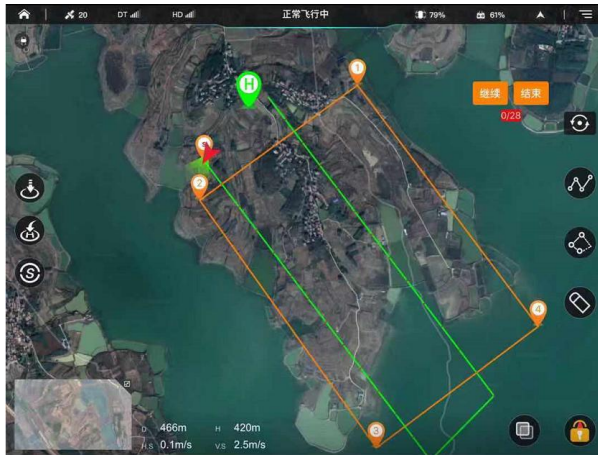
SAGA's Highlights :

1. A server database is stored in the Forestry Bureau of each country. The officials of the Forestry Bureau headquarters can retrieve the required data through the webpage anytime and anywhere.
2. Task planning. Planning the designated flight mission according to the needs of surveying and mapping.
3. Forests are large and SAGA's flight time is long. A height of 500m is needed to shoot a 2 square kilometer area.
4. Plan to take photos of different points of the target and then stitch out the terrain in real-time.
5. Take pictures with their own coordinates, latitude and longitude.

SAGA Case Study

2

Route Planning



Equipped with a 4K HD camera, GDU SAGA can carry out aerial surveys of designated areas through planned patrol routes.

If you find an image to be inconsistent, SAGA can record it with its HD camera and send it back for further analysis

Staff can then generate a map, calculate the lost area of a forest and put it on record according to the actual data provided by SAGA

A person wearing a blue uniform and cap is kneeling on a grey concrete floor, packing a dark-colored bag. A black drone controller with a thin antenna is lying on the floor to the left. The scene is dimly lit, with the person's uniform and the bag being the primary light sources.

GDU | SAGA

In Flight, Day and Night