



GDU | SAGA

In Flight, Day and Night

-POWER LINES INSPECTION-

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POWER LINES INSPECTION
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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

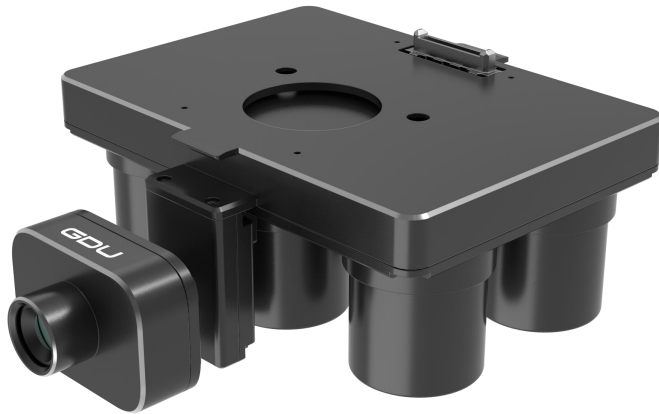
Floodlight with Camera (GISL01)



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 POWER LINES INSPECTION APPLICATION



■ SAGA Advantages



Low costs



Planned route patrol can be set up for simple and quick operation;



Save time and improve efficiency;



Protect the safety of patrol personnel and reduce risks.

SAGA's payloads can maintain real-time video transmission, provide image recognition, analyze temperature differences, send back information quickly, improve work efficiency, and eliminate the shortcomings of manual inspection.



Power line inspection



Parts inspection

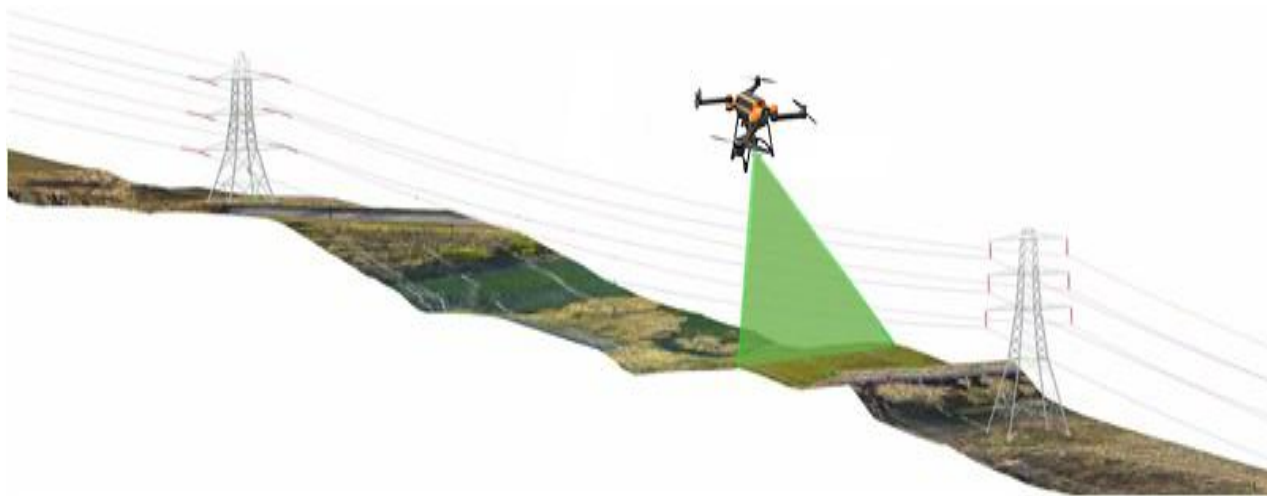


Infrared image acquisition



Tower patrol

SAGA Power Line Applications



Automatic Route Inspection

By carrying various intelligent payloads, SAGA can carry out daily inspection from multiple angles to collect data on the planned route, collect visible light and infrared thermal imaging temperature data and images, as well as analyze and detect equipment status and surrounding environment conditions through data transmission, including the growth of nearby trees.

SAGA Power Line Applications



Infrared Temperature Measuring

SAGA can be equipped with a visible light and infrared dual-light camera for day and night monitoring, real-time monitoring of the target area during long missions, and fixed-point hovering for accurate monitoring and temperature identification over a designated target. During night operations, real-time video monitoring can be carried out for identifying temperature anomalies of power towers and the status of each power line. Additionally, SAGA can easily assist in material management.

SAGA Power Line Applications



Power Lines and Components Monitoring

Due to wind and rain, power equipment is prone to corrosion, collapse and other problems. Manual inspection often requires carrying tools for operations, making it inefficient. By carrying the 4K, 10X, or 30X cameras, SAGA can clearly produce a high-quality video, quickly providing feedback, and insure more accurate information for power inspection and maintenance.

SAGA Power Line Applications



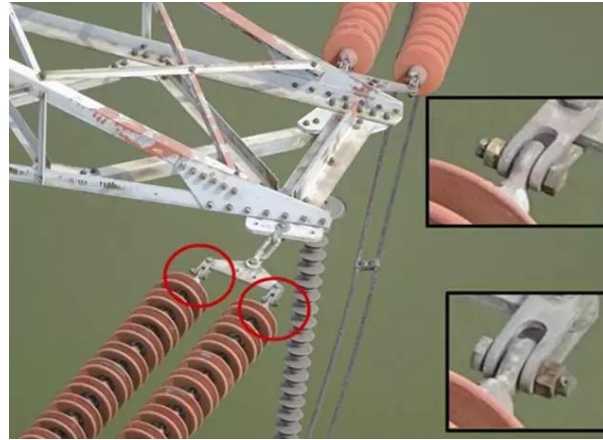
Dampers and Ring Connector Inspection

By carrying an HD optical zoom camera, infrared thermal imaging camera or other payloads, SAGA can monitor the important components of an power tower, conduct regular and fixed-point air patrol, comprehensively and intuitively monitor the status of dampers and ring connectors, as well as the status of the power station.

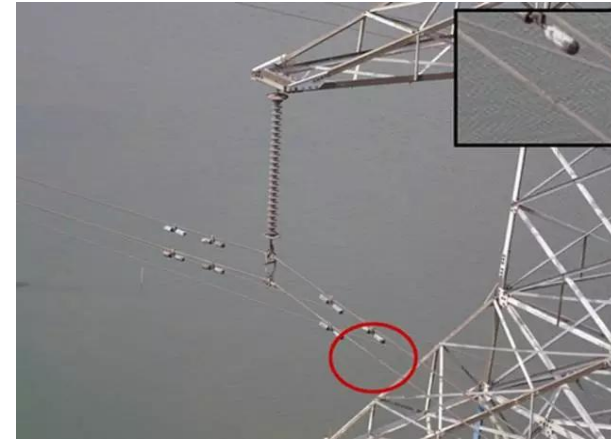
Zoom in on the Details



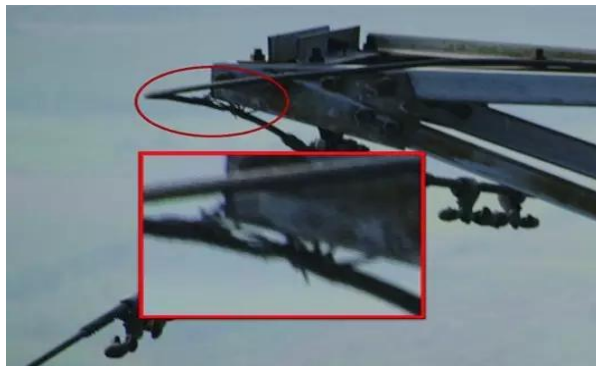
Screw Falls Off



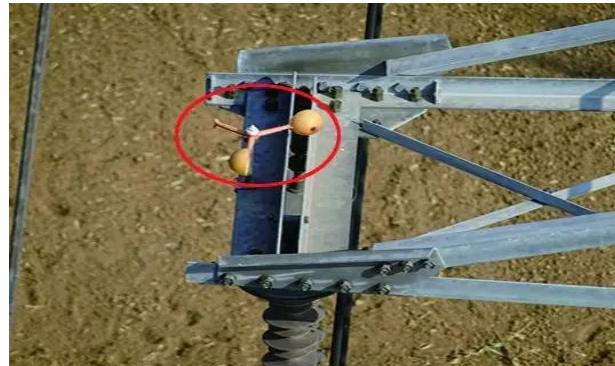
Lost Pin Nail



Missing Damper



Broken Grounding Wire



Broken Bird Repellent



Pin Nail Falls Off

An aerial photograph of a high-voltage power line tower. The tower is a complex lattice structure of grey and yellow metal. It is surrounded by several insulators, which are long, cylindrical structures with multiple blue ceramic discs. A small drone is flying in the air near the tower. The background shows a rural landscape with green fields, a road, and a town with buildings in the distance. The sky is overcast and grey.

03 CASE STUDIES

SAGA Case Study

1

Client: Shenzhen Power Bureau

Background : Traditional methods rely heavily on manual inspection. However, there are many disadvantages to this such as poor data, low precision, low degree of reuse, work intensity, time consuming and difficult operation in complex terrain. It is easier for the power supply bureau and other power supply enterprises to conduct regular inspections of transmission lines by the use of SAGA.

Necessity : SAGA is used instead of manual operations to alleviate the problems of high cost and inefficiency. It simultaneously reduces safety risks and is convenient to use; SAGA is used for power patrol inspection to detect the defects of power lines and to monitor the status of the surrounding environment like illegal building and tree growth nearby; SAGA can also detect temperature anomalies which may also further complicate the status of electrical equipment.

Difficulties:

1. **Low Work Efficiency:** According to the data of the power supply bureau, for traditional inspections, each 100km transmission line inspection needs roughly 160 man-hours, that is, if a 100km line inspection is to be completed within one working day, at least 20 line inspection personnel are needed, which is obviously inefficient.
2. **Low Data Accuracy:** When personnel conduct inspections on high-voltage conductors, power towers, insulators, and transformers, they need to carry a large amount of tools to collect data, which not only inconveniences inspectors, but also complicates the subsequent data collection, analysis, and processing.
3. **Safety issue:** The dangers of line patrol work can not be ignored. Patrol personnel have to face the reality that many high voltage transmission lines are set up in mountainous areas, forests, and other places where safety risks are high.
4. **Strict Requirements for UAV Volume, Payloads, and other Comprehensive Indicators:** Most UAVs on the market today are larger with a wheelbase of over 700mm, heavier, and unable to fold. However, lighter industrial UAVs with wheelbases less than 700mm also have disadvantages such as fixed mounts, weak interchangeability, insufficient comprehensive sensors, limited video transmission distance and shooting quality, as well as insufficient data analysis and intelligent processing capacity. Additionally, these lighter UAVs lack open source software and an open platform.



GDU SAGA



4K HD Camera



800X600 Infrared Camera



30X Optical
Zoom Camera

UAV : GDU SAGA

Payloads : 4K Camera, Infrared Camera , 30X
Optical Zoom Camera

Content : Power line inspection, troubleshooting,
infrared equipment detection

Details : SAGA is not limited by the environment, it
can take off and land at any time, collect data at a
rapid speed, and conduct monitoring. Monitoring
and patrol inspections are carried out on targets on
the ground or in the air. At the same time, by
pairing SAGA with an intelligent payload, it can
obtain accurate data through a variety of means,
bringing great simplicity, speed, efficiency and
precision to the work of the power industry.



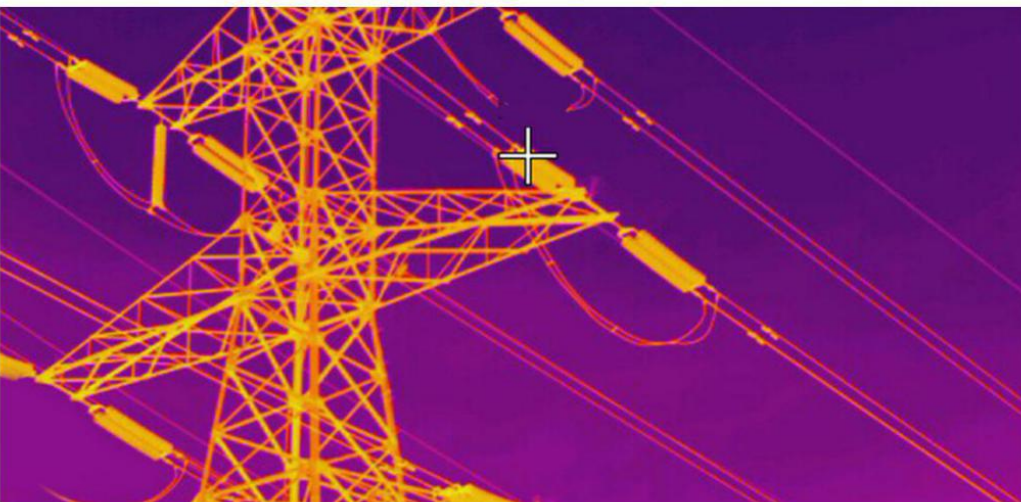
Power Line Inspection

Content : Some power lines were selected for day and night inspection. The 4K HD camera and 30X optical zoom camera were mounted on SAGA to view the status of the power towers and their surroundings in real time during the day. The laying of the line, the status of equipment and the temperature of the power towers were detected and the data feedback was quick.

Advantages: Practical, full field of vision, accurate and real-time data feedback

SAGA Case Study

3



Infrared Data Acquisition

Content : With the 800 x600 infrared thermal camera, SAGA accurately monitors power towers, has rapid access to high precision information and map data, timely captures high-resolution digital imaging and measures pylon temperatures. Not only can it survey existing power lines and conduct routine maintenance, but SAGA can also check for hidden dangers.

Advantages : Real-time visual feedback, measure a wide range of temperatures (-20 °C ~ 150 °C), patrol with high efficiency, strong adaptability to the environment

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 single 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.

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