HIKVISION

TRANSCEND YOUR VISION WITH A FALCON IN HAND

UNMANNED AERIAL VEHICLE PRODUCT

01 A WORLDWIDE LEADER FOCUSED ON EXCELLENCE IN SECURITY SYSTEMS

Hikvision is the world's leading supplier of video surveillance products and solutions. Featuring the industry's strongest R&D workforce, Hikvision uses its state-of-the-art manufacturing facilities to design and develop innovative CCTV and video surveillance products.

Hikvision's complete product suite includes Smart IP cameras, HD analog cameras, speed domes, NVRs, hybrid and standalone DVRs, video management software, access control and alarm systems, encoders, decoders, digital video servers, and other elements of sophisticated security systems and CCTV technology for any security need. Hikvision products serve a diverse set of vertical markets including retail, banking and finance, transportation, education, commercial, government, residential applications, and more.

Now, Hikvision launches the Falcon Series Industrial Unmanned Aerial Vehicles (UAV), based on the accumulation of video technology, was invented by deep integration of cross-technology domains in Hikvision.

HIKVISION AT A GLANCE

Established in **2001**

US$ **3.88** billion sales revenue in 2015, with growth rate of **47%**

7-8% of annual revenue invested in research & development (R&D)

53% compound average growth rate from 2004 to 2015

Over **350** technology partners
Products sold in over **150** countries

17,000 employees, including **7,000** engineers

EXPLORE VERTICAL SOLUTIONS TOGETHER WITH HIKVISION

As a solution partner with the world's largest CCTV equipment provider, you will enjoy:

- Platform/software integration support
- Extensive customization support
- Local support by Hikvision overseas subsidiaries
- Technical project support from Hikvision's R&D
- Possibilities for co-marketing cooperation
- New product/solution introduction
- New product demo support
- Yearly site visit for technology/product exchange
- Information Sharing via Solution Partner Platform

HIK ROBOTICS

With years of accumulated experience in image acquisition, processing, and pattern recognition, among other things, and with immense creative ability, Hikvision entered the robotics industry in 2014 and developed three major business areas. These include "machine vision," industry-level unmanned aerial vehicles (UAVs), and automated guided vehicles. Meanwhile, Hangzhou Hik Robotics Technology Co., Ltd., was established in 2016.

• Machine Vision

Covers the entire series of industrial camera products; applying 3C, metal processing, industrial automation, logistics, and other fields, achieves quick and accurate positioning guidance, dimension measurement, identification, and other applications

• Industrial UAVs

Based on Hikvision's video technology history, the Falcon Series UAVs were invented through deep integration of multiple technology domains. The UAV performs multiple-angle comprehensive 3D surveillance from a global perspective, thus greatly expanding the current surveillance coverage range and leading the security industry into the 3D age.

• Automated Guided Vehicles

For warehouse and logistics industries, Hikvision has developed Smart warehouse management, including sorting and carrying goods. Layout, spatial utilization, and efficiency are greatly improved.

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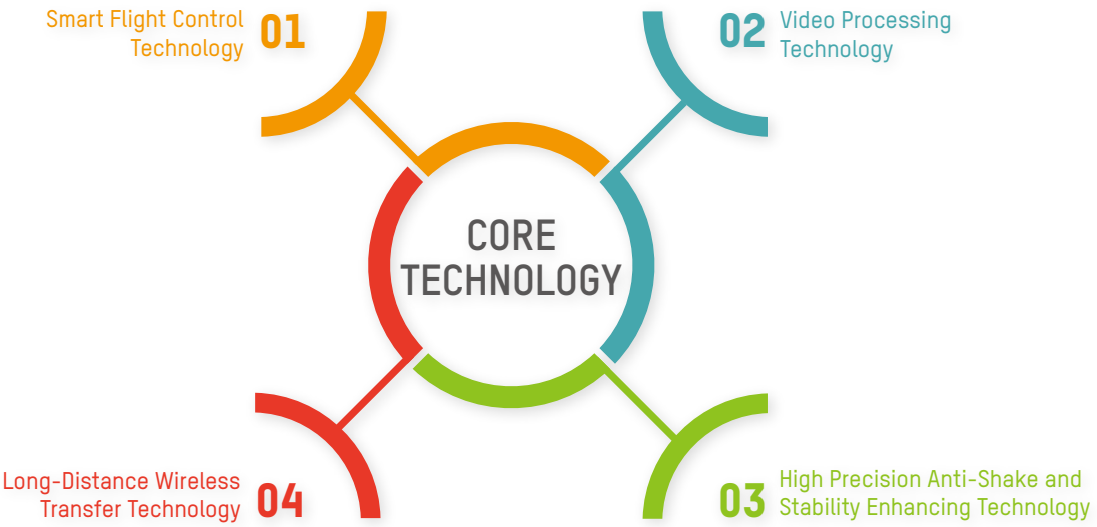
02 INTRODUCTION TO UNMANNED AERIAL VEHICLES (UAVS)



• 4K HD video and 37x hyper-zoom, offering clear visibility of vehicle plates at the height of hundreds of meters, assisting in the surveillance of global situations and details
• Support for protocols including ONVIF, PSIA, and Ehome, and can be connected to the industry platform for information integration and interaction
• Long time endurance for extended duration of flight missions
• Can be controlled at a distance of more than 5km, monitoring very large and remote areas
• Boasts a self-stabilizing gimbal, ensuring the stability of hyper-zoomed images
• Maintains dual-protection via digital frequency-hop system and transmission encryption, effectively protecting recorded data and reducing the risk of hijacking
• Foldable and easy to dismount, accessible for single-person operation, reducing labor requirements
• Support for a variety of payloads (visible light gimbal, thermal imaging gimbal, loudspeaker, and more) to achieve multiple functions on a single vehicle with various gimbals for a variety of applications

UAV COMPOSITION

The Eagle Series UAV system is made up of three modules, including the aerial vehicle, Payload, and the ground station.

UNMANNED AERIAL VEHICLES

The UAV is responsible for receiving control signals and performing flight missions as the mission load carrier. It executes flight via remote control and the ground station. At the same time, it supports the transmission of video, location information, flight data, and other information to the ground station.

Quad-Rotor
Aerial Vehicle

UAV-MX4080A	
Diagonal wheelbase	805mm
Max. Ascent Speed	8m/s
Max. flight Altitude	5000m above sea level
Max. Horizontal Flight Speed	15m/s
Control mode	Manual operation, auto flight
Auto Pilot	One-touch take-off, one-touch landing, route planning,specified point/point of interest/rotating point flight,etc. Configurable flight height limit and safety radius of interest points
Security	Low battery protection and control signal loss protection.
Duration of endurance	35 min (with standard load) 40 min (load-free)
Weight(Load-free)	Approx. 6.3 kg (13.89 lb)
Withstand Wind	Withstand strong Breeze (12m/s)
Battery capacity	22000mAh
Built-in battery	Lipo
Operating temperature	-10°C~50°C(14°F to +122°F)

Hex-Rotor
Aerial Vehicle

UAV-MX6100A	
Diagonal wheelbase	1000mm
Max. Ascent Speed	8m/s
Max. flight Altitude	5000m above sea level
Max. Horizontal Flight Speed	15m/s
Control Mode	Manual operation, auto flight
Auto Pilot	One-touch take-off, one-touch landing, route planning,specified point/point of interest/rotating point flight,etc. Configurable flight height limit and safety radius of interest points
Security	Low battery protection and control signal loss protection.
Max flight time	25 min (with standard load) 30 min (load-free)
Weight(Load-free)	Approx. 6 kg (13.23 lb)
Withstand Wind	Withstand strong Breeze (12m/s)
Battery capacity	22000 mAh
Built-in battery	Lipo
Operating temperature	-10°C to +50°C (14°F to +122°F)
Technology	Advanced Visual Perspective Technology,Positioning System Based on the Optical Flow Technology

PAYLOADS

The Falcon Series UAVs support a variety of payloads, including 2 MP, 4K HD and thermal imaging 3-axis stability enhancing gimbals, loudspeakers, and more. Users can adapt the appropriate payload according to the application requirements for many different scenarios.

2 MP,3-Axis Stability-Enhancing Gimbal Camera

	UAV-G3V0230A
Sensor	1/2.8" Progressive Scan CMOS
Resolution	1080P, 720P, 4CIF
Frame rate	25fps, 30fps
Aperture	F1.6-F4.4 auto iris
Focal length	4.5-135mm
Optical zoom	30 times
Digital zoom	12 times
Electronic shutter	1 sec -1/30000 sec
Day/night switch mode	ICR filter type
Compression standard	H.264/H.265/MJPEG
Digital noise cancellation	3D
Storage function	Support built-in TF card, maximum capacity: 128G
Pan-tilt rotation angle	Pitch -135°~+45°; roll ±45°; heading 360°
Maximum controllable rotation speed	Pitch 40°/s; roll 40°/s; heading 40°/s
Pan-tilt control precision	±0.02°
Pan-tilt operating mode	Heading follow-up, heading independence

4K High-Definition, 3-Axis Stability-Enhancing Gimbal Camera

	UAV-G3V0823A	UAV-G3V0837A
Sensor	1/1.7" Progressive Scan CMOS	
Resolution	50HZ: 25fps(4096×2160), 60HZ: 30fps(4096×2160) 50HZ: 25fps(3840×2160), 60HZ: 30fps(3840×2160)	
Frame rate	25fps; 30fps	
Aperture	F1.6-F3.4	F1.5-F4.5
Focal length	5.9-135.7mm	5.7-210mm
Optical zoom	23 times	37 times
Digital zoom	12 times	
Electronic shutter	1 sec -1/30000 sec	
Day/night switch mode	ICR filter type	
Compression standard	H.264/H.265/MJPEG	
Digital noise cancellation	3D	
Storage function	Support built-in TF card, maximum capacity: 128G	
Pan-tilt rotation angle	Pitch -135°~+45°; roll ±45°; heading 360°	
Maximum controllable rotation speed	Pitch 40°/s; roll 40°/s; heading 40°/s	
Pan-tilt control precision	±0.02°	
Pan-tilt operating mode	Heading follow-up, heading independence	

Thermal-Imaging, 3-Axis Stability-Enhancing Gimbal Camera

	UAV-G3T050T
Sensor	VOx UFPA (uncooled focal plane detector)
Resolution	384×288
Response wave band range	8~14μm
Temperature detection range	-20°C~150°C
Focal length	50mm
Digital zoom	8 times
Compression standard	H.264/MJPEG
Color Palette	White hot, black hot, fusion 1, rainbow, fusion 2, rust red 1, rust red 2, dark brown, color 1, color 2, ice and fire, rain, red hot, green hot
Smart analysis	Temperature detection, highest temperature real-time display
Storage function	Support built-in TF card, maximum capacity 128G
Pan-tilt rotation angle	Pitch -135°~+45°; roll ±45°; heading 360°
Maximum controllable rotation speed	Pitch 40°/s; roll 40°/s; heading 40°/s
Pan-tilt control precision	±0.02°
Pan-tilt operating mode	Heading follow-up, heading independence

Speaker

UAV-AT1025A Loudspeaker utilizes a high-quality tweeter to be carried with the vehicle for fast penetration into crowded areas. It not only inspects the on-site situation in real-time, but transmits announcements at the site, relaying demands for evacuations, for example. Applications range from protective security at large-scale events to dispersion of crowds at group incidents.

· Remote audio transmission with short delay
· Maximum broadcast distance: 500 m
· Adjustable audio volume, level 0-10
· Longest audible transmission distance: more than 5km
· Included camera transmits real-time video at the scene

GROUND STATION

The ground station is responsible for simultaneously receiving video, location information, flight data, and other information sent back from the aerial vehicle, and sending the control signals to it. The ground station executes flight control, flight parameter configurations, location display, and other functions of the UAV via powerful software, all while monitoring the state of the device at all times.

Commander-Series Handheld Ground Station

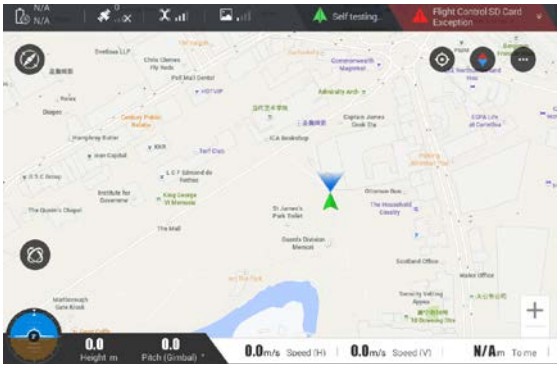
	UAV-S11HA
Communication Distance	≥5 km (Unobstructed, free of interference)
Image transmission device	Digital microwave
Data transmission device	Digital FH radio
Decoding Format	H.265/H.264
Flight data	GPS, satellite number, battery capacity, flight time remain, data transmission signal strength, longitude & latitude, pitch angle, roll angle, nose direction, horizontal speed, vertical speed, gimbal pitch angle, and aircraft height
Video interface	Micro HDMI
Network interface	Built-in 4G slot
Built-in storage	Micro SD card
Built-in battery	High-energy Density Lipo
Operating temperature	-20°C to 55°C (-4°F to 131°F)
Operating humidity	95% (non-condensing)

Commander-Series All-In-One Ground Station

	UAV-S11SA
Communication Distance	≥5 km (Unobstructed, free of interference)
Image transmission device	Digital microwave
Data transmission device	Digital FH radio
Decoding Format	H.265/H.264
Flight data	GPS, satellite number, battery capacity, flight time remain, data transmission signal strength, longitude & latitude, pitch angle, roll angle, nose direction, horizontal speed, vertical speed, gimbal pitch angle, and aircraft height
Video Output	BNC, HDMI
Network Connection	4G Network, Wi-Fi AP and RJ45
Storage	256G SSD (Solid State Disk)
Power Supply Mode	220V Power Supply
Built-in battery	High-energy Density Lipo
Operating temperature	-20°C to 55°C (-4°F to 131°F)
Operating humidity	95% (non-condensing)

Ground Station Navigator Client Software

Hikvision Control Unit Client Software executes control of the UAV, configurations of flight parameters, display of location, and other functions, while monitoring the state of the UAV at all times. As a Smart control interface for the aerial vehicle, Hikvision's Ground Station Software features a user-friendly operation interface, comprehensive information display, and strong system compatibility, among many other advantages. It also integrates the UAV's Smart flight, security strategy, and various function setups.



- Supports real-time flight data
- One-touch take-off and return
- Parameter configurations for ground station, gimbal, and video snapshot
- E-map operation: Real-time display of location and position of UAV with more intuitive operation
- Multiple flight modes: Guided flight, track planning, hotspot hovering, and more
- Supports gimbal pitch and heading control
- Real-time video preview, historical video playback, and historical track inquiry functions

UAV JAMMER

Defender-Series Unmanned Aerial Vehicle Jammer

- Multi-band frequency Jamming, including major frequency range of UAV
- Wide Field of Jamming, no Accurate Aiming Required
- Over 800 meters Range of Jamming, Adjustable Transmitting Power
- Li-Po Battery Power Supply
- Separated Host and Antenna, Available for one Staff
- Ergonomic Design, Easy for Operation

	UAV-D04JA
Radio Frequency	
Effective Range	2.4G Control Command/Video Transmission; GPS Beidou Navigation System ;GLONASS; Galileo Expandable
Transmission Power	13W at Most (Adjustable)
Effective Jamming Distance	≥ 800 m
System	
Power Consumption	Approx. 85W
Battery Time of Endurance	≥ 1.5 h (at Full Capacity)
Dimensions	Host: 230mm×97mm×347mm (9.05"×3.82"×13.66")
	Antenna: 871mm×148mm×342mm (34.29"×5.83"×13.46")
Operating Temperature	-20°C to 55°C (-4°F to 131°F)

No.	Name		Function
1	Battery		Power on the Device
2	RF (Radio Frequency Indicator)		Radio Frequency Status
3	Power Indicator		Battery Status
	Power Adjusting Knob	2.4G	2.4G Control Command/Video Signal Transmission
		GPS	Global Position System
		CH3	Reserved
4	Radio Frequency Switch		Radio Frequency On/Off
5	Power Switch		Power On/Off

03 UAV APPLICATIONS

APPLICATION SCENARIOS

The Falcon Series UAVs are easy to operate with high flexibility, efficiency, and adaptability, providing from a global perspective comprehensive 3D surveillance from multiple angles, greatly expanding the coverage of existing surveillance, and leading the surveillance industry into the era of 3D surveillance. These UAVs support a wide variety of payloads to meet the demands for various application scenarios.

Routine Patrol

Facilities Patrol & Inspection

Urban Management

Air Patrol

Border Patrol

Environment Monitoring

Road Condition Investigation

Hydraulic Inspection

Harbor And Shipping Management

Emergency Command

Fire Command

Disaster Monitoring

Flood-Fighting & Emergency Rescues

Anti-Smuggling & Drug Control

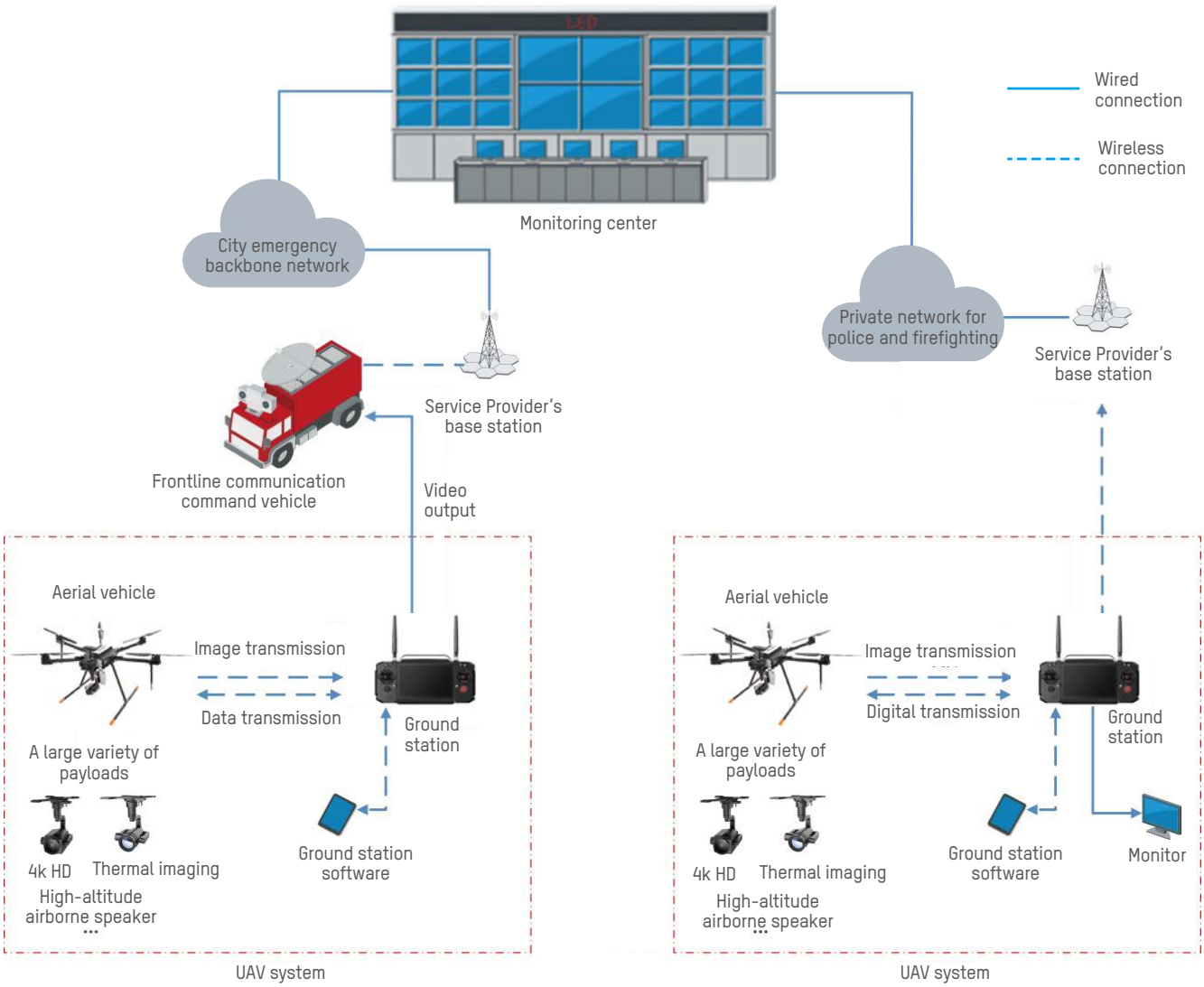
Accident Investigation

Explosion Rescue

Target Search

SYSTEM STRUCTURE

The Falcon Series UAV system rests on stable images and video captured in designated scenarios, using digital microwave image transmission technology to transfer front-end images to the ground control station. Images then transfer to the platform center via wireless or wired technology for analysis and processing.



The UAVs can be operated manually, or setup via the ground station for flight tracking and other missions. The gimbal attached to the aerial vehicle can transmit real-time images to a ground station through the image transmission device on the vehicle. Flight information for aerial vehicles can be transferred to the ground station via data transmission link. The ground station can employ a 4G network to send the images and flight data to the command center, providing information on the site to the command staff.

EXTENDED APPLICATIONS

Video-based applications

1. Centralized Surveillance

The UAV system integrates seamlessly with a central administration platform and incorporates video surveillance systems for centralized monitoring. On-site situations can be viewed by controlling the gimbal from the central administration platform for concerted coordination with the other resources in order to make timely scheme adjustment and give actionable commands. This greatly enhances the efficiency and depth of visualization management.

2. Mobile Command

The UAV system connects in real time with the mobile command vehicle via the ground station. On-site situations can be viewed from the mobile command vehicle with human-to-vehicle interaction to execute critical mobile commands with high flexibility and efficiency. Meanwhile, the mobile command vehicle can also be connected to the back-end command center.

3. Big Data

UAVs lead the big data revolution in the sky and provide a solid foundation for Security Data Technology (SDT). The UAV system can function as a SDT 3D perception device to collect and transfer the data to a back-end platform for real-time data analysis and application, substantiating the UAV's place in big data SDT.

Application of "UAV+" mode

Just as "Internet+", the strong integration of UAVs and other application technologies gives rise to "UAV+" mode of application. Different payload can be carried with the UAV according to different scenarios and requirements to satisfy different demands of application. For instance, in the event of explosions of bio-chemicals, the UAV can detect whether there is toxic gas in the air by carrying a gas detection equipment; when performing security protection measures for large-scale events, the loudspeaker can provide a means for real-time aerial monitoring of the site and deploying the police to evacuate the crowd.

UAV CASE STUDY

Gaoyou City Public Security Bureau's "Sky-Net" Project

Effectively Solving Surveillance Video Retrieval Delay and Timely Target Location Failure

The Falcon Series UAV System by Hikvision has been successfully adopted in the "sky-net" action project of the Gaoyou Public Security Bureau, where it effectively solved problems such as delay in the retrieval of surveillance video at existing fixed-point locations on the ground and the inability to locate targets in a timely manner. It has also been very effective in solving problems concerning blind areas of certain scenarios or places where surveillance cameras cannot be installed. In particular, UAVs can locate the target quickly with high flexibility and efficiency under emergency situations.

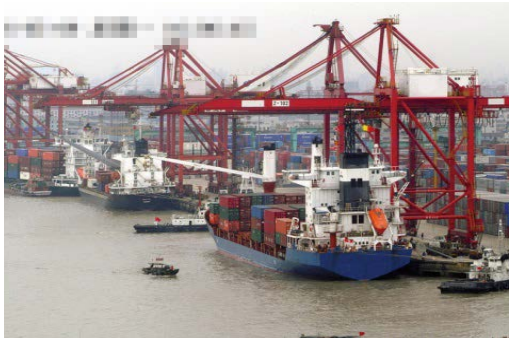
Xi'an Traffic Police Dispatch UAV Project

Greatly Improving the Efficiency of Road Monitoring and Regulation for Xi'an's Traffic Police Dispatch

Xi'an's Traffic Police have successfully adopted the Falcon Series UAV System by Hikvision and effectively improved their management efficiency. The UAVs conduct routine patrol in the air, finding congested roads and conducting global and accurate investigation into causes, duration, and vehicles involved in episodes of congestion. This helps the traffic command center personnel disperse traffic quickly and effectively. The UAVs also arrive first in the event of sudden road accidents. The command center can learn about the on-site situation from real-time video feedback and take appropriate action.

Dongying Harbor Emergency Management Online Monitoring Video Identification System

Effectively Resolving Difficulties in Waterways and Harbor Management



Dongying Harbor Emergency Management's online video identification system has successfully employed the Falcon Series UAVs from Hikvision to resolve various problems in waterway and harbor management effectively and enhance the management and emergency response capabilities of the harbor considerably. The Falcon Series UAVs freely take off and land by the sea without relying on particular harbor or law-enforcement vessels. This remarkably reduces manpower and material resources and lowers costs of maintenance.

The Greater Khingan Police Equipment UAV Project

Effectively Overcomes Obstacles in Forest Management and Forest Fire Control

The Greater Khingan Police equipment UAV project has successfully applied the Falcon Series UAV System from Hikvision in forest fire monitoring and effectively resolved the problems in forest fire prevention. The UAVs, performing routine patrol above the forests, automatically detect environmental heat and inspect locations of fire within the field of view with payloads specific to the application scenarios. When performing fire scene investigation, real-time images of the fire are sent to the command center along with geographical coordinates of the scene, burned areas, burn direction, and other information. This information assists in the timely coordination of fire fighters and rescue personnel. This solution reduces manpower and material resources as well as ensures personal security.

UNMANNED AERIAL VEHICLE PRODUCT

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