

# V10R





# System Performance

## **Pure electric platform, payloads sharing, high product reusability**

V10R adopts pure electric power, and is easy to use and maintain with high reliability.

V10R supports optoelectronic pods, aerial survey modules, oblique modules, with a standard structure for fast payload interchange, which can meet various application scenarios and greatly enhance product reuse value.

## **High integration, high performance, high reliability UAV platform**

V10R is equipped with a flight control navigation system, avionics system, high-precision differential GNSS board, navigation GNSS module, and dual differential directional antenna with independent intellectual property rights. The core sensors all adopt three-way backup, ensuring safety and security.

## **3D active environmental detection**

Adopting multi-sensor fusion technologies such as vision and millimeter wave radar to further enhance the drone's active detection ability of the surrounding environment, ensuring safe and reliable takeoff, landing, and flight processes.

## **360 ° all-weather situational awareness**

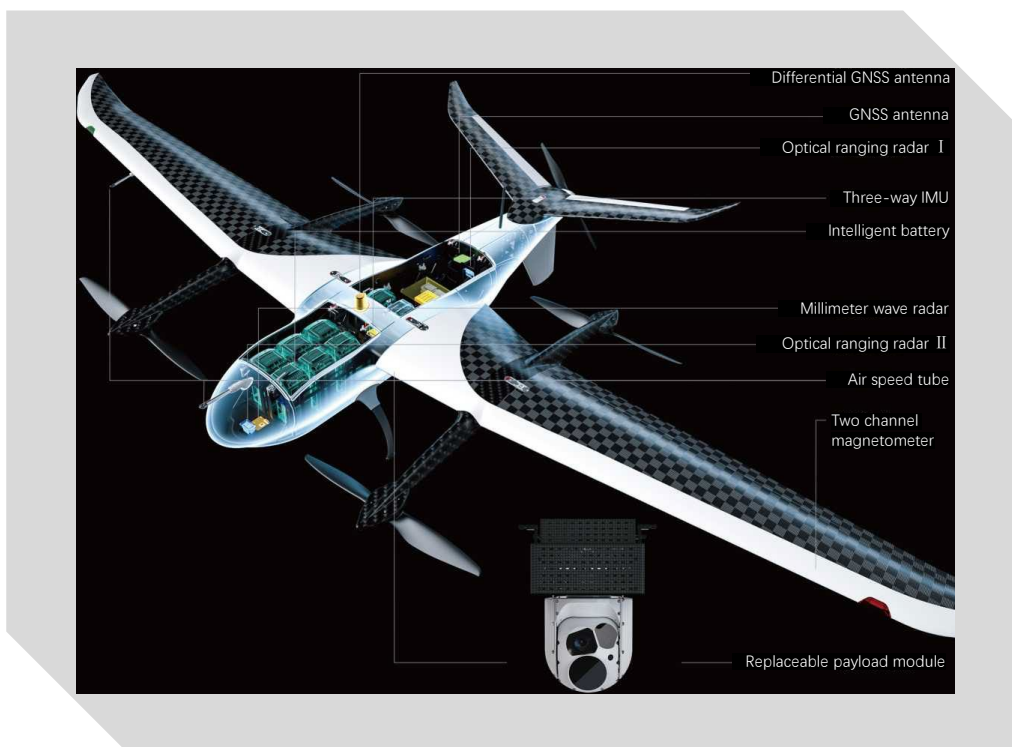
V10R is equipped with an industrial grade nitrogen filled photoelectric pod with 30 times optical zoom capability, an ultra-low delay high-definition image transmission system, and built-in AES128 digital encryption. Based on 5G, artificial intelligence algorithms and Feima Cloud service, V10R has all-weather air situational awareness capabilities.

## **High precision mapping**

Equipped with high-precision differential GNSS boards, it provides RTK/PPK fusion solution, high-precision POS-assisted aerial triangulation, image control-free topographic mapping and other capabilities.

## SYSTEM PARAMETERS

Materiel	Carbon fiber + paper-based honeycomb + PMI reinforced composite	
Wing span		4150mm
Length		1750mm
Height		700mm
Power mode		Electric
Number of motors		5pcs
Take-off weight		29kg
Maximum payload weight		6 kg
Cruising speed		20m/s
Endurance	150min@6kg payload,240min@1kg payload	
Take-off and landing method	Fully automatic vertical take-off and landing	
Positioning accuracy	$\pm 1\text{cm} + 1\text{ppm (H)}$ , $\pm 2\text{cm} + 1\text{ ppm (V)}$	
Practical elevation limit		7500m
Wind resistance		Force 6
Control distance		50km
Image transmission distance		50km
Operation temperature		-20°C~55°C
Shipping box	Aluminum alloy equipment box EVA lining	
Task response time	unfold $\leq 10\text{min}$ ,fold $\leq 10\text{min}$	
Payloads	Dual-light pod/ Tri-light pod/ Aerial photogrammetry/ Oblique	





# Payload List



## V-TIRV10

### Dual-optical pod



High resolution visible light video camera			
Target	Size (m <sup>2</sup> )	Detection Range(km)	Recognition distance (km)
People	0.5X1.8	6	2
Vehicle	3x6	15	6
Focal length			
			4.3mm ~ 129mm
Optical zoom			
			30x
Digital zoom			
			2x
FOV (H)			
			63.7°~ 1.15°
Working band			
			0.4μm ~ 0.9μm
Type			
			1/2.8" color CMOS
Effective pixels			
			1920x 1080 pixel
Detection and recognition distance		visibility≥25km, Atmospheric temperature 25°C	
Long wave uncooled infrared sensor			
Target	Size(m <sup>2</sup> )	Detection Range (km)	Recognition distance (km)
People	0.5x1.8	1.6	0.6
Vehicle	3x6	4.8	1.6
Detector Type			
			Vanadium oxide
Focal length			
			45mm/F1.2
Effective pixels			
			640x512 pixels
FOV			
			13.7° (H) x11° (V)
Detection and recognition distance		Visibility 210km, Atmospheric temperature 25°C	

- Industrial-grade pod, internal high-pressure nitrogen charging treatment
- 30x optical zoom of visible light lens+2x digital zoom
- Capable of pointing for positioning, map annotation
- Supporting three-level segmented enhanced fog penetration
- AI recognition guides drone to lock and track
- Video photo switching, one-click photo taking for evidence collection
- Riched OSD information overlay video
- POS data storage



# Payload List



## V-TIRV20 Triple-optical pod

High resolution visible light video camera			
Target	Size (m <sup>2</sup> )	Detection Range(km)	Recognition distance (km)
People	0.5X1.8	6	2
Vehicle	3x6	15	6
Focal length		4.3mm ~ 129mm	
Optical zoom		30x	
Digital zoom		2x	
FOV (H)		63.7°~ 1.15°	
Working band		0.4μm ~ 0.9μm	
Type		1/2.8" color CMOS	
Effective pixels		1920x 1080 pixel	
Detection and recognition distance		visibility ≥ 25km, Atmospheric temperature 25°C	
Long wave uncooled infrared sensor			
Target	Size(m <sup>2</sup> )	Detection Range (km)	Recognition distance (km)
People	0.5x1.8	1.87	0.72
Vehicle	3x6	5.3	2
Detector Type		Vanadium oxide	
Focal length		45mm/F1.2	
Effective pixels		640x512 pixels	
FOV		13.7° (H) x11° (V)	
Detection and recognition distance		Visibility 210km, Atmospheric temperature 25°C	
Laser ranging			
Working band		1.55pm	
Ranging Accuracy		±2m	
Max continuous repetitive frequency		<2Hz	
Measuring distance		≤ 3km(Vehicle), ≤ 5km(building) (visibility 10km, 25°C, reflectance ≥ 0.3, humidity ≤ 80%)	



- Industrial-grade pod, internal high-pressure nitrogen charging treatment
- 30x optical zoom of visible light lens+2x digital zoom
- The longest measuring distance is 5km.
- Capable of pointing for positioning, map annotation
- Supporting three-level segmented enhanced fog penetration
- AI recognition guides drone to lock and track
- Video photo switching, one-click photo taking for evidence collection
- Riched OSD information overlay video
- POS data storage



# Payload List



## V-CAM10

### Photogrammetric module

Camera model	Sony A7R4
Resolution	9504 × 6336
Effective pixel	61MP
Pixel size	3.76μm
Effective sensor area	35.7mm×23.8mm
Focal length	40mm



## D-OP4000

### Oblique module

Camera model	Sony A7R4×5
Resolution	9504 × 6336
Effective pixel	61×5MP
Pixel size	3.76μm
Effective sensor area	35.7mm×23.8mm
Lens	down view 40mm, tilt view 56mm







**Forest fire prevention and control**



**Pipeline inspection**



**Maritime patrol**



**Highway inspection**



**Water inspection**



**River inspection**



**Public security**

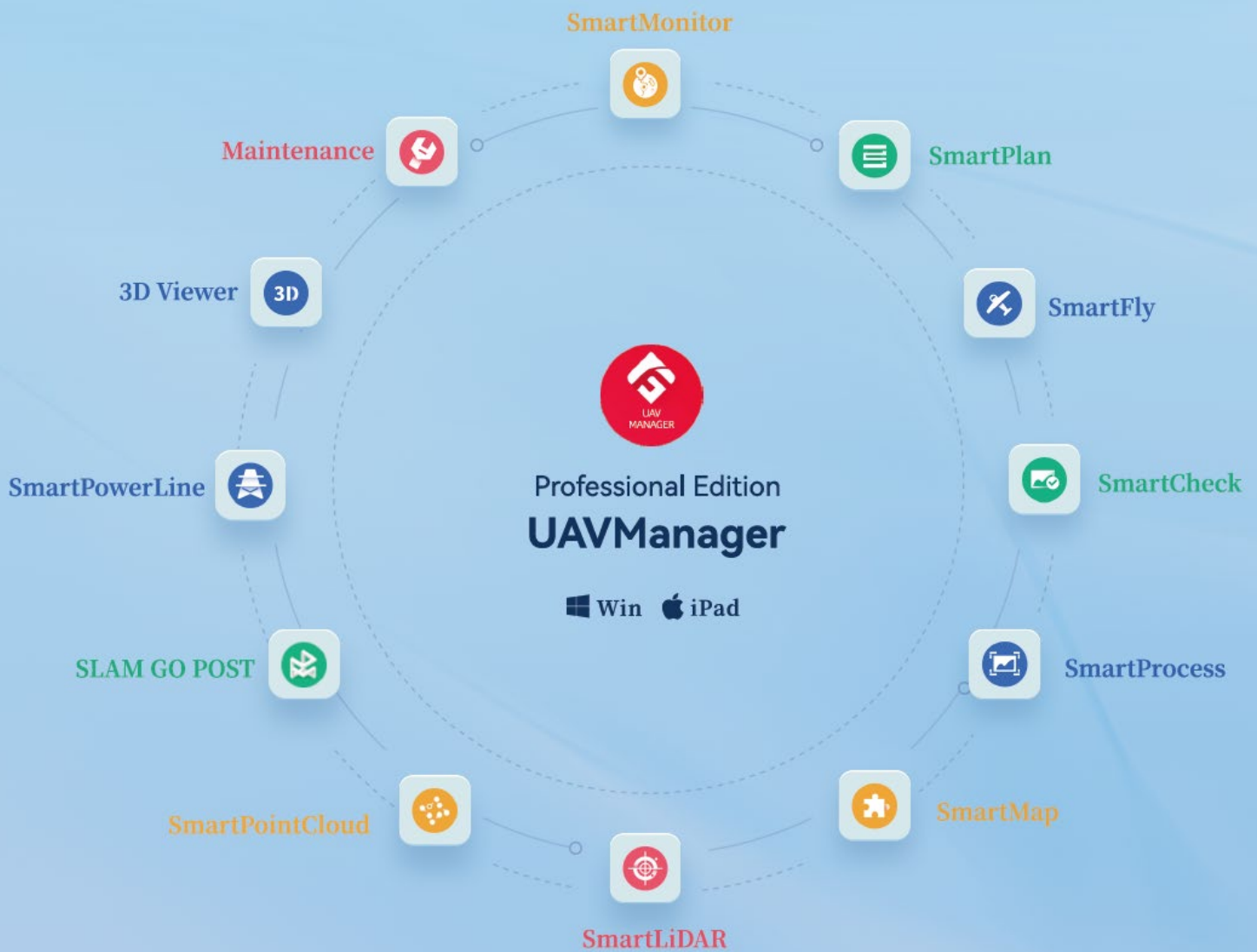


**Emergency rescue**



# UAVManager

Software



"UAVManager Professional" is a powerful software platform developed by Feima Robotics for the drones including fixed wing and rotary wing. It integrates a number of software modules, such as SmartPlan, SmartFly, SmartCheck, SmartProcess, SmartMap, Smartmonitor, Maintenance and so on, to realize many functions such as flight route planning, all kinds of flight data acquisition, point cloud data processing, data display, and maintenance etc. In different practical applications, UAVmanager can plan the accurate flight path according to 3D information of the actual scene, which greatly improves the efficiency of the flight and data acquisition. Moreover, it can also provide flight real-time monitoring, rapid flight quality inspection, flight precision control, automatic mapping and data preprocessing, slam data processing and abundant 4D and 3D results generation. In addition, it also provides lots of cloud services such as system upgrade, smart maintenance and information push.



# UAVManager

## Software modules



### SmartPlan

SmartPlan is a flight route planning software for fixed wing and rotary wing UAV. It can automatically generate the best flight route according to the terrain fluctuations and image requirements of the mission area, based on high-precision realistic 3D terrain information. In super-large task area, the segmentation at any angle and the adjustment for the course angle can automatically be done to meet the requirement of post-processing. The terrain-following flight algorithm based on high-precision 3D model helps to generate the accurate terrain following flight route and ensure the consistency of acquired data throughout the flight.



### SmartFly

Smartfly is a UAV flight monitoring software, which can help us to monitor the real-time flight status and parameters in realistic 3D scene and modify flight status. It can provide smart early warning to ensure the safety of flight missions. It also helps to obtain the data of a single sortie according to the actual field conditions and automatically continue the flight through the software to complete the coverage of the whole area and improve the work efficiency.



### SmartMonitor

SmartMonitor is a special module of UAVManager, providing functions such as statistic replay of flight process, analysis of flight records and summary display.



### Maintain

It can realize online upgrade of UAVManager software, online health analysis and fault diagnosis for drones, and firmware upgrade for all Feima's UAV platforms.



### SmartPowerLine

SmartPowerline is software specially designed for inspection and analysis of overhead transmission line. It supports tower position calibration and point cloud data cutting, automatic classification and extraction of tower, power line, vegetation, ground, supports line vector fitting, detection and analysis parameters customization and other functions. It can simulate and predict transmission lines under different working conditions, output safety distance analysis report and line channel inspection report.



### SLAM GO POST

SLAM GO POST is a PC software module for SALM100. It can perform data post-processing, generate high-precision and high-definition color point clouds, produce partial panoramic images, display point cloud and do data optimization.



### SmartCheck

SmartCheck is a professional and automated software used for on-site flight quality inspections and assessment. It helps to quickly generate quality reports and to improve the efficiency of UAV data quality inspection process and the reliability of subsequent processing.



### SmartProcess

SmartProcess is UAV data preprocessing software, which provides advanced camera model self-calibration algorithm, distortion removal tools, and RTK/PPK fusion solution tools etc., to meet the surveying and mapping requirements of high quality and high precision. In addition, it also provides image smoothing and homogenization, enhancement, pyramid creation, format conversion, result accuracy check and other preprocessing functions.



### SmartMap

SmartMap is a one-click UAV data processing software, which can complete UAV data ortho and oblique aerial triangulation, self-adaptive feature point matching, control point measurement, orthographic correction, full-pixel high-density point cloud matching, true-orthophoto, 3D reconstruction and other processing. Support high-precision and high-quality results output of DSM, TDOM and realistic 3D models, support control point intelligent measurement, POS assisted aerial triangulation, direct mapping without ground control points.



### SmartMap

SmartLiDAR can generate accurate point cloud data based on the original data such as distances, positions, and attitudes obtained by UAV's LiDAR module. Cloud data calculation, LiDAR module calibration, strip adjustment, massive point cloud visualization, standard point cloud output and other functions are integrated in this software.



### SmartPointCloud

SmartPointCloud is a point cloud data post-processing software that supports various data sources. It can browse, display, process and edit point cloud data. It includes automate point cloud classification algorithms and comprehensive interactive editing tools, and can produce standard terrain results and other thematic results.



### Feima 3D Viewer

Feima 3D Viewer is an application software for 3D data generation from oblique photography. It supports the import of current popular OSGB format 3D products and provides many functions, such as distance measurement, area measurement, volume measurement, and model import. Feima 3D Viewer provides a unified display platform for existing 3D terrain models, oblique high-resolution 3D terrain models, and fine 3D models.