

D-90_{Pro} Intelligent 4K Full-Color Night Vision Multi-Sensor Spherical Pod



Characteristics

- 4K resolution and AI-ISP full-color night vision imaging engine empowerment.
- Carries a 60x hybrid zoom camera, a thermal camera and a laser range finder.
- Provides the distance and location coordinates of the observed target, assisting in quick and precise positioning.
- Optional AICore features AI multi-object detection and tracking, which can constantly track one of the persons and vehicles intelligently identified in the image.
- Low-profile spherical shape and 3-axis nonorthogonal mechanical stabilized structure, minimize the gyration radius and the wind resistance of the pod. The D-90_{Pro} is able to spin continually around its yaw axis.
- Supports network, UART and S.BUS control and compatible with both private protocol and MAVLink protocol.
- Thanks to the Dual-IMU complementary algorithms with IMU temperature control and carrier AHRS fusion, the D-90_{Pro} provides a stabilization accuracy at $\pm 0.01^\circ$.
- Can be mounted onto multiple carriers, whether downward or upward.
- With the Dragonfly software, user can watch the image and control the pod without protocol ducking.
- Photos and videos can be downloaded online through the "Gallery" function of the Dragonfly software.
- With the customized QGC software, all the functions of the pod can be achieved in conjunction with an open source autopilot.
- Screen supports overlaying OSD information such as latitude, longitude and altitude. Image supports shooting point coordinate EXIF save.
- 20~53 VDC wide voltage input.

Specifications

General			
Product Name	D-90Pro		
Dimensions	96.4 x 96 x 147mm		
Weight	620g		
Operating Voltage	20 ~ 53 VDC		
Power	10.5W (AVG, ranging off) / 55W (Stall, ranging on)		
Mounting	Downward / Upward		
Target Positioning Accuracy ^[1]	Horizontal Error: 1.8m	@	Horizontal Distance: 105m
	Vertical Error: 0.7m		Relative Height: 75m
	Horizontal Error: 17.4m	@	Horizontal Distance: 513m
	Vertical Error: 6.7m		Relative Height: 119m
	Horizontal Error: 33.8m	@	Horizontal Distance: 1003m
	Vertical Error: 13.7m		Relative Height: 246m
Gimbal			
Gimbal Type	3-axis Nonorthogonal Mechanical Stabilization		
Angular Accuracy	±0.01°		
Controllable Range	Pitch: -175° ~ +105° , Roll: ±50° , Yaw: ±360° constantly		
Max Controllable Speed	±200°/s		
Zoom Camera			
Image Sensor	1/2.8-inch CMOS; Effective Pixels: 8.29M		
Lens	Focal Length: 5.5~54.7mm (Equivalent focal length: 37.2~370.5mm)		
	Aperture: f/1.8~f/2.6		
	HFOV: 53.9° ~5.8°		
	VFOV: 31.9° ~3.3°		
Resolution	3840(H) x 2160(V)		
Pixel Pitch	2.9µm(H) x 2.9µm(V)		
Optical Zoom Rate	10x		
Equivalent Digital Zoom Rate	6x		
Object Detection Distance	EN62676-4:2015	Person ^[2] : 1651m; Light vehicle ^[3] : 2170m; Large vehicle ^[4] : 4624m	
	Johnson Criteria	Person: 18862m; Light vehicle: 57844m; Large vehicle: 123232m	
Object Identification Distance	EN62676-4:2015	Person: 330m; Light vehicle: 434m; Large vehicle: 925m	
	Johnson Criteria	Person: 4716m; Light vehicle: 14461m; Large vehicle: 30808m	
Object Verification Distance	EN62676-4:2015	Person: 165m; Light vehicle: 217m; Large vehicle: 462m	
	Johnson Criteria	Person: 2358m; Light vehicle: 7231m; Large vehicle: 15404m	

[1] Measured by pod mounted on a dual antenna RTK positioned multicopter drone to a known coordinate point. The target positioning accuracy is influenced by carrier's positioning and orientation accuracy, angle between the direction of pod mounted and the heading of carrier, slant range, gradient of measurement line and air quality. The data is for reference only.

[2] Reference dimension of person: 1.8x0.5m. Critical dimension under Johnson criteria is 0.75m

[3] Reference dimension of light vehicle: 4.2x1.8m. Critical dimension under Johnson criteria is 2.3m

[4] Reference dimension of large vehicle: 6.0x4.0m. Critical dimension under Johnson criteria is 4.9m

Thermal Camera	
Thermal Sensor	Uncooled VOx Microbolometer
Lens	Focal Length: 19mm (Equivalent focal length: 83.6mm)
	Aperture: f/1.0
	HFOV: 22.9°
	VFOV: 18.4° DFOV: 29.0°
Resolution	640(H) x 512(V)
Pixel Pitch	12μm(H) x 12μm(V)
Equivalent Digital Zoom Rate	8x
Spectral Band	8~14μm
Sensitivity (NETD)	<50mk@f1.0@25°C
Object Detection Distance	Person: 750m; Light vehicle: 2300m; Large vehicle: 4900m
Object Identification Distance	Johnson Criteria Person: 188m; Light vehicle: 575m; Large vehicle: 1225m
Object Verification Distance	Person: 94m; Light vehicle: 288m; Large vehicle: 613m
Temperature Measurement	Optional (Thermometry Type)
Temperature Measurement Method	Spot Measurement, Area Measurement
Temperature Measurement Range	High Gain: -20°C~150°C Low Gain: 0°C~550°C
Temperature Alert	High-temp Alert, Low-temp Alert
Sun Burn Protection	Supported ^[5]
Palette	White Hot, Black Hot, Tint, Fulgurite, Iron Red, Hot Iron, Medical, Arctic, Rainbow 1, Rainbow 2
Laser Range Finder	
Wavelength	905nm
Max Laser Power	1mW
Beam Angle	3.5mrad
Beam Diameter	0.35m@100m
Laser Safety	Class 1M (IEC 60825-1:2014)
Measurement Accuracy	±1.0m
Measurement Range	5-1200m (φ12m vertical surface with 20% reflectivity)
AI Multi-object Detection & Tracking (Optional AICore)	
Object Identification Size	≥30x20 px
Object Identification Rate	≥85%
Object Identification Quantity	≤50
Target Tracking Size	16x16~256x256 px
Tracking Deviation Refresh Rate	30Hz
Tracking Deviation Output Delay	≤60ms
Target Pixel Error	≤±1 px
Tracking Speed	>24 px / frame
Target Memory Time	>5s

[5] Do not expose the thermal camera lens to a strong energy source such as sun, lava or laser beam. The temperature of the observation target should not exceed 600°C, otherwise it will cause permanent damage

Image & Video

Image Format JPEG

Maximum Image Resolution Internal memory: 3840 x 2160
SD card: 1920 x 1080

EXIF Shooting point coordinate

Video Format MP4

Maximum Video Resolution Stream: 1920 x 1080P @25fps
Internal memory: 3840 x 2160 @30fps
SD card: 1920 x 1080 @30fps

Stream Encode Format H.264, H.265

Stream Network Protocol RTSP

Storage

Supported SD Cards Supports a U3/V30 or above MicroSD card with a capacity of up to 256GB

Environment

Operating Temperature -20°C ~ 50°C

Storage Temperature -40°C ~ 60°C

Operating Humidity ≤85%RH (Non-condensing)
