D-90AI Intelligent Multi-sensor Spherical Pod

Characteristics

- Features AI multi-object detection and tracking, which can constantly track one of the persons and vehicles intelligently identified in the image.
- Carries a 30x hybrid zoom camera, a thermal camera and a laser range finder.
- Low-profile spherical shape and 3-axis nonorthogonal mechanical stabilized structure, minimize the gyration radius and the wind resistance of the pod. The D-90DE is able to spin continually around its yaw axis.
- With the GCU, the D-90DE supports network, UART and S.BUS control. The GCU supports both private protocol and MAVLink protocol.
- Thanks to the Dual-IMU complementary algorithms with IMU temperature control and carrier AHRS fusion, the D-90DE provides a stabilization accuracy at ±0.01°.
- Can be mounted onto multiple carriers, whether downward or upward.
- With the GCU and the Dragonfly software, user can watch the image and control the pod without protocol ducking.
- 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. Video stream supports SEI stacking.
- 14~53 VDC wide voltage input.

Specifications

General			
Product Name	D-90AI		
Dimensions	Pod: 96.4 x 96 x 147mm GCU: 45.4 x 40 x 13.5mm		
Weight	Pod: 608g GCU: 18.6g		
Operating Voltage	14 ~ 53 VDC		
Power	Pod: 10.5W (AVG, ranging off) / 55W (Stall, ranging on) GCU: 1.8W		
Mounting	Downward / Upward		
Target Positioning Accuracy[1]	Horizonal Error: 1.8m Vertical Error: 0.7m	@	Horizonal Distance: 105m Relative Height: 75m
	Horizonal Error: 17.4m Vertical Error: 6.7m	@	Horizonal Distance: 513m Relative Height: 119m
	Horizonal Error: 33.8m Vertical Error: 13.7m	@	Horizonal Distance: 1003m Relative Height: 246m
Gimbal			
Gimbal Type	3-axis Nonorthogonal Mechanical Stabilization		
Angular Accuracy	±0.01°		
Controllable Range	Pitch: -150° ～+50° , Yaw: ±360° constantly		
Max Controllable Speed	Pitch:±200°/s, Yaw: ±200°/s		
Zoom Camera			
Image Sensor	1/2.8" CMOS; Effective Pixels: 2.07M		
Lens	Focal Length: 4.7~47mm HFOV: 61.3° ～6.8° VFOV: 36.9° ～3.9° DFOV: 68.4° ～7.8°		
Resolution	1920 x 1080		
Pixel Pitch	2.9μm		
Optical Zoom Rate	10x		
Equivalent Digital Zoom Rate	3x		
Min Illumination	Night Vision off: 0.01Lux / F1.6 Night Vision on: 0.0015Lux / F1.6		
Object Detection Distance	EN62676-4:2015	Person[2]: 709m; Light vehicle[3]: 932m; Large vehicle[4]: 1986m	
	Johnson Criteria	Person: 8103m; Light vehicle: 24851m; Large vehicle: 52943m	
Object Identification Distance	EN62676-4:2015	Person: 142m; Light vehicle: 187m; Large vehicle: 397m	
	Johnson Criteria	Person: 2026m; Light vehicle: 6213m; Large vehicle: 13236m	
Object Verification Distance	EN62676-4:2015	Person: 71m; Light vehicle: 93m; Large vehicle: 199m	
	Johnson Criteria	Person: 1013m; Light vehicle: 3106m; Large vehicle: 6618m	

[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: 18mm HFOV: 24° VFOV: 18° DFOV: 30.4°	
Resolution	640 x 512	
Pixel Pitch	12μm	
Spectral Band	8~12μm	
Sensitivity (NETD)	<50mk@25℃	
Object Detection Distance	Johnson Criteria	Person: 750m; Light vehicle: 2300m; Large vehicle: 4900m
Object Identification Distance		Person: 188m; Light vehicle: 575m; Large vehicle: 1225m
Object Verification Distance		Person: 94m; Light vehicle: 288m; Large vehicle: 613m
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		
Object Size	16x16 ~ 128x128 px	
Object Identification Delay	＜40ms	
Tracking Speed	±32 px / field	
Tracking Deviation Refresh Rate	30Hz	
Tracking Deviation Output Delay	≤5ms	
Image & Video		
Image Format	JPEG	
Maximum Image Resolution	1920 x 1080	
EXIF	Shooting point coordinate	
Video Format	MP4	
Maximum Video Resolution	1080P@25fps	
Stream Encode Format	H.264, H.265	
Stream Network Protocol	RTSP	
Storage		
Supported SD Cards	Supports a Speed Class 10 MicroSD card with a capacity of up to 256GB	
Support File System	HDD-FAT32	
Environment		
Operating Temperature	-20℃ ~ 50℃	
Storage Temperature	-40℃ ~ 60℃	
Operating Humidity	≤85%RH (Non-condensing)	