D-125AI 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 an 120x 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-125AI is able to spin continually around its yaw axis.
- Supports network, UART and S.BUS control. Supports both private protocol and MAVlink protocol.
- Thanks to the Dual-IMU complementary algorithms with IMU temperature control and carrier AHRS fusion, the D-125AI provides a stabilization accuracy at ±0.01°.
- 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. Video stream supports SEI stacking.
- 20~53 VDC wide voltage input.

Specifications

General			
Product Name	D-125AI		
Dimensions	142 x 125 x 187mm		
Weight	1055g		
Operating Voltage	20 ~ 53 VDC		
Power	10.7W (Static, ranging off) / 40.0W (Peak, ranging on)		
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: -120° ~ 40°, Roll: ±40°, Yaw: ±360°constantly		
Max Controllable Speed	±200°/s		
Zoom Camera			
Image Sensor	1/2.8-inch CMOS, Effective Pixels: 4.09M		
Lens	Actual Focal Length: 4.7~141mm (Equivalent focal length: 27.9~837mm) Aperture: f/1.5~f/4.0 HFOV: 59.5° ~ 2.2° VFOV: 35.8° ~ 1.2° DFOV: 66.6° ~ 2.5°		
Resolution	2688(H) x 1520(V)		
Pixel Size	2.0μm(H) x 2.0μm(V)		
Optical Zoom Rate	30x		
Equivalent Digital Zoom Rate	4x		
Object Detection Distance	EN62676-4:2015	Person[2]: 3283m; Light vehicle[3]: 4315m; Large vehicle[4]: 9192m	
	Johnson Criteria	Person: 37500m; Light vehicle: 115000m; Large vehicle: 245000m	
Object Identification Distance	EN62676-4:2015	Person: 657m; Light vehicle: 863m; Large vehicle: 1838m	
	Johnson Criteria	Person: 9375m; Light vehicle: 28750m; Large vehicle: 61250m	
Object Verification Distance	EN62676-4:2015	Person: 328m; Light vehicle: 432m; Large vehicle: 919m	
	Johnson Criteria	Person: 4688m; Light vehicle: 14375m; Large vehicle: 30625m	

[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: 25mm (Equivalent focal length: 93.2mm) Aperture: f/1.0 HFOV: 17.5° VFOV: 14.0° DFOV: 22.3°	
Resolution	640(H) x 512(V)	
Pixel Size	12μm(H) x 12μm(V)	
Equivalent Digital Zoom Rate	8x	
Spectral Band	8~14μm	
Sensitivity (NETD)	<50mk@F1.0@25℃	
Object Detection Distance	Johnson Criteria	Person: 1042m; Light vehicle: 3194m; Large vehicle:6806m
Object Identification Distance		Person: 260m; Light vehicle: 799m; Large vehicle: 1701m
Object Verification Distance		Person: 130m; Light vehicle: 399m; Large vehicle: 851m
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	2.5mrad	
Beam Diameter	0.25m@100m	
Laser Safety	Class 1M (IEC 60825-1:2014)	
Measurement Accuracy	±0.3m (≤300m) / ±1.0m (>300m)	
Measurement Range	5-2000m (ϕ12m vertical surface with 20% reflectivity)	
AI Multi-object Detection & Tracking		
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℃, otherwise it will cause permanent damage

Image & Video	
Image Format	JPEG
Maximum Image Resolution	1920 x 1080
EXIF	Shooting point coordinate
Video Format	MP4
Maximum Video Resolution	Stream: 1920 x 1080 @25fps Recording: 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℃ ~ 50℃
Storage Temperature	-40℃ ~ 60℃
Operating Humidity	≤85%RH (Non-condensing)