Z-9B_Ver4.0 Intelligent Multi-sensor 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.
- Laser lighting module ensures the cameras getting a clear image even in complete darkness.
- 3-axis orthogonal mechanical stabilized structure, 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 Z-9B 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	Z-9B					
Dimensions	173 x 144 x 206mm					
Weight	1158g					
Operating Voltage	20 ~ 53 VDC					
Power	21.4W (AVG, ranging & light off) / 50.4W (Stall, ranging & light 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 orthogonal Mechanical Stabilization					
Angular Accuracy	±0.01°					
Controllable Range	Pitch: -120° ~ 55°, Roll: ±40°, Yaw: ±360°constantly					
Max Controllable Speed	±200°/s					
Zoom Camera						
Image Sensor	1/2.8-inch CMOS,	1/2.8-inch CMOS, Effective Pixels: 4.09M				
Lens	Actual Focal Length: $4.7 \sim 141$ mm (Equivalent focal length: $27.9 \sim 837$ mm) Aperture: $f/1.5 \sim f/4.0$ HFOV: $59.5^{\circ} \sim 2.2^{\circ}$ VFOV: $35.8^{\circ} \sim 1.2^{\circ}$ DFOV: $66.6^{\circ} \sim 2.5^{\circ}$					
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] : 3283	Bm; Light vehicle	e ^[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 Johnson Criteria		•	132m; Large vehicle: 919m 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 Sensor Uncooled VOx Microbolometer Focal Length: 25mm (Equivalent focal length: 93.2mm) Aperture: f7L0 Lens 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°C Object Detection Distance Johnson Criteria Person: 1042m; Light vehicle: 3194m; Large vehicle: 6806m Object Verification Distance Johnson Criteria Person: 260m; Light vehicle: 3194m; Large vehicle: 6806m Object Verification Distance Optional (Thermo				
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Lens Aperture: f/1.0 HF0V: 17.5' VF0V: 14.0° DF0V: 22.3' BF0V: 22.3' BF0V	Thermal Sensor	Uncooled VOx Microbolometer		
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Laser Safety Class 1M (IEC 60825-1:2014) Measurement Accuracy $\pm 0.3 \text{m} (\le 300 \text{m}) / \pm 1.0 \text{m} (> 300 \text{m})$ Measurement Range $5\text{-}2000 \text{m} (\phi 12 \text{m} \text{ vertical surface with } 20\% \text{ reflectivity})$ Laser Lighting Module Wavelength $850\pm 10 \text{nm}$ Laser Power $0.8W \times 2$ Beam Angle $8^\circ + 30^\circ$ Beam Diameter $14\text{m} + 54\text{m}@100\text{m}$ Effective Illumination Distance $\le 200\text{m}$	Beam Angle	2.5mrad		
Measurement Accuracy $\pm 0.3 \text{m}$ ($\leq 300 \text{m}$) / $\pm 1.0 \text{m}$ (>300 m)Measurement Range5-2000 m ($\phi 12 \text{m}$ vertical surface with 20% reflectivity)Laser Lighting Module850 $\pm 10 \text{nm}$ Wavelength850 $\pm 10 \text{nm}$ Laser Power0.8W x2Beam Angle8° + 30°Beam Diameter14 m + 54 m @ 100 mEffective Illumination Distance $\leq 200 \text{m}$	Beam Diameter	0.25m@100m		
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Laser Lighting Module Wavelength 850±10nm Laser Power 0.8W x2 Beam Angle 8°+30° Beam Diameter 14m+54m@100m Effective Illumination Distance ≤200m	Measurement Accuracy	±0.3m (≤300m) / ±1.0m (>300m)		
Wavelength 850 ± 10 nm Laser Power $0.8W \times 2$ Beam Angle $8^{\circ}+30^{\circ}$ Beam Diameter $14m+54m@100m$ Effective Illumination Distance $\leq 200m$	Measurement Range	5-2000m (φ12m vertical surface with 20% reflectivity)		
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Beam Angle 8°+30° Beam Diameter 14m+54m@100m Effective Illumination Distance ≤200m	Wavelength	850±10nm		
Beam Diameter 14m+54m@100m Effective Illumination Distance ≤200m	Laser Power	0.8W x2		
Effective Illumination Distance ≤200m	Beam Angle	8°+30°		
	Beam Diameter	14m+54m@100m		
Laser Safety Class 3B (IEC 60825-1-2014)	Effective Illumination Distance	≤200m		
Luser Surety Class SD (ILC 00025 1.2017)	Laser Safety	Class 3B (IEC 60825-1:2014)		

[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

AI Multi-object Detection 8	ይ 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		
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°C ~ 50°C		
Storage Temperature	-40°C ~ 60°C		
Operating Humidity	≤85%RH (Non-condensing)		