LF-H17 series
User Manual for Four-Light Pod V2.3

catalogue

Revise resume

| version number	Revision date	Revision
V1.0	2025/2/20	-First release
V2.0	2025/6/25	-Updated the cover image Updated the gimbal rotation angle -Added quick-release structure assembly instructions -Removed the connector introduction in hardware wiring Add feature description
V2.1	2025/7/31	-Added models H17A-ZY and H17A-DJ
V2.2	2025/12/02	-Updated feature description
V2.3	2025/12/02	-Updated feature description

1. Product Overview

1.1. Product Introduction

　　The LF-H17 series is a quad-camera pod equipped with a 12MP fixed-focus visible light camera, a 17x ultra-high-definition optical zoom visible light camera, 640-resolution thermal imaging, and a high-precision laser rangefinder. It features a lightweight three-axis gimbal and adaptive vibration damping module, complemented by autofocus and gimbal stabilization algorithms to ensure stable and clear footage during aerial operations.

　　The LF-H17 features an SOC processor with a neural network engine and built-in AI algorithms, capable of performing target detection and tracking in dual-light imaging. It supports display modes such as picture-in-picture and split-screen. With high performance, high integration, high scalability, low cost, and low power consumption, it meets the demands of energy inspection, smart security, and forestry protection.

1.2. Component Description

1. 云台接口
2. 航向电机
3. 横滚电机
4. 俯仰电机
5. SD卡槽
6. 激光测距仪
7. 变焦相机
8. 广角相机
9. 红外相机
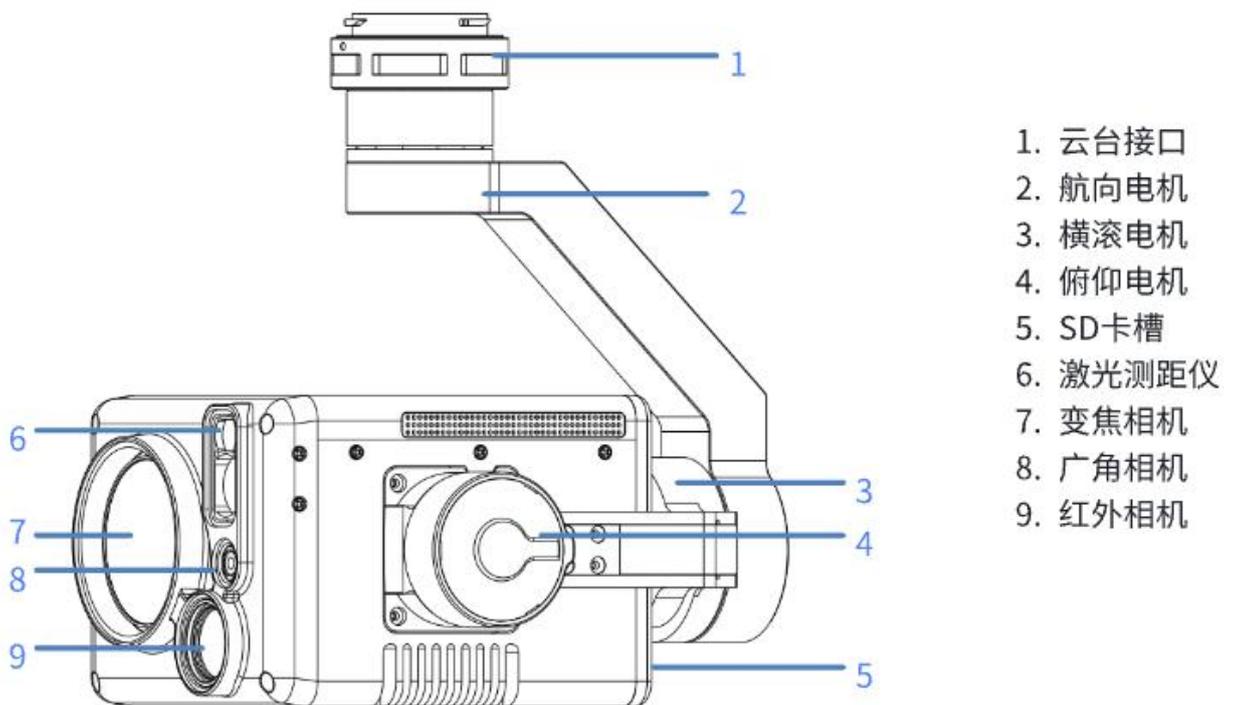
1.3. Model Introduction

Number	model	demonstration of the type	remarks
1	LF-H17A	standard interface	
2	LF-H17A-ZY	Fit for the Purple Swallow F15	
3	LF-H17A-DJ	Compatible with DJI drones	

1.4. container loading list

Number	name	model	unit	quantity	remarks
1	four light pods	LF-H17A	tower	1	
2	Shock-absorbing bracket with quick-release	-	cover	1	Standard interface only
3	explosion-proof tank	four light explosion-proof box	cover	1	

2. technical parameter

2.1. Overall parameters

video output interface	Ethernet
control signal interface	H17A:1 S.BUS, 1 RS422,1 100Mbps Ethernet, 1 serial port, 1 CAN
	H17A-ZY: 1 100Mbps Ethernet port, 1 serial port
	H17A-DJ: 1 100Mbps Ethernet port, 1 serial port
Power supply area	10V ~ 28V
System power consumption	Average power consumption: ≤15W Peak power consumption: ≤40W
levels of protection	IP54
working temperature	-20℃~60℃
Size (excluding shock absorbers)	H17A：129mm×158mm×181mm
	H17A-ZY：129mm×158mm×172mm
	H17A-DJ：129mm×158mm×172mm
Weight (excluding shock absorbers)	less than 1000g
mechanical interface	H17A: Quick-release & fixed hole

type	H17A-ZY: Quick disassembly
	H17A-DJ: Quick disassembly

2.2. Zoom camera

imaging sensor	20 million pixels		
Maximum photo size	5120*3840 (4:3)		
Video resolution	3840×2160@30fps、1920×1080@30fps		
coded format	H.264、H.265		
Focus mode	MF、AFS		
effective focal length	7.1mm-122mm		
equivalent focal length	34.0mm-589.2mm		
iris diaphragm	F1.6-F4.2		
optical zoom	17 times		
angle of field	focal distance	DFOV	HFOV	VFOV
	Wide	64.8°	53.8°	41.7°
	Tele	4.2°	3.4°	2.5°

2.3. Wide-angle camera

imaging sensor	12 megapixels
Maximum photo size	4056*3040 (4:3)
Video resolution	3840*2160@30fps 1920*1080@30fps
coded format	H.264、H.265
effective focal length	4.48mm
equivalent focal length	24.7mm
iris diaphragm	F2.6
angle of field	DFOV82° HFOV70° VFOV55°

2.4. infrared camera

thermal imaging sensor	Non-cooling vanadium oxide infrared focal plane detector		
Maximum photo size	640*512		
Video resolution	640*512@25fps		
coded format	H.264、H.265		
pixel pitch	12μm		
wavelength coverage	8-14μm		
noise equivalent temperature difference	≤ 50 mk@25℃，f#1.0		
effective focal length	18mm		
equivalent focal length	79mm		
iris diaphragm	F1.1		
angle of field	24.2°*19.5°		
Pseudo-color	Supports 11 pseudo-color modes		

2.5. laser distance measuring instrument

range	5-1500m		
ranging accuracy	≤1m（≤300m） ≤±2m(＞300m)		
operating wavelength	905nm±10nm@25℃		
range frequency	Single, 1Hz, 2Hz, 5Hz		

2.6. Cloud Terrace

stabilization system	3 axes (pitch, roll, heading)		
range of rotation	cabrage	roll	azimuth
	±120°	-45°～+45°	±320°
stability accuracy	≤0.01°		
work pattern	Follow and Lock		

2.7. Structural shape
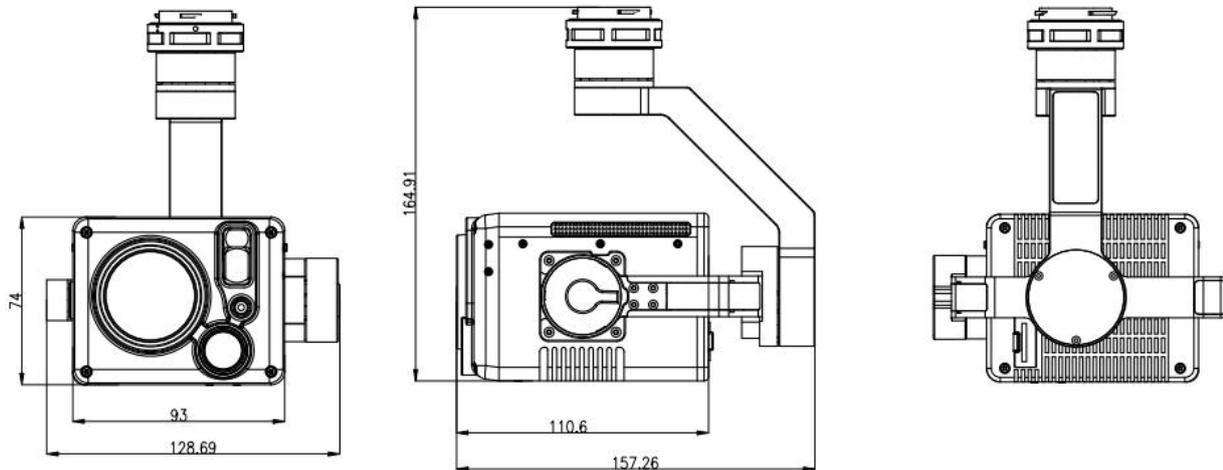
3. function Introduction

3.1. Display Mode

3.1.1. Single video display

It supports infrared, zoom, wide-angle camera single channel video display, and can switch different camera video streams.

3.1.2. Split Screen

It supports side-by-side display of two video streams from infrared panoramic and zoom cameras, and can switch between zoom and wide-angle camera video streams.

Zoom control is supported when zoom camera video stream is displayed.

3.1.3. Picture-in-picture display

Embed a smaller secondary screen into the main screen. The main screen typically displays the primary camera image, while the secondary screen shows images from other cameras. The secondary screen can be overlaid at the four corners of the main screen.

3.2. Photo and video recording

- Single shot: Take one photo after clicking the take button.
- Continuous shooting: Take photos at fixed intervals after clicking.
- Camera resolution: Full resolution (12MP wide-angle, 20MP zoom) and 3840*2160/1920*1080 resolution are supported for visible light photography, while 640 resolution is available for infrared photography.

- Video recording resolution: Supports recording visible light at 3840*2160@30fps and 1920*1080@30fps, and infrared at 640*512@25fps.
- Image effects: Supports switching between normal image, black-and-white night vision, and full-color night vision.

The conventional image synthesis has better effect, which is more suitable for daytime comprehensive scene.

Black-and-white night vision is better suited for observing image details in nighttime scenes, but not for daytime scenes.

Full-color night vision is better suited for observing the true image quality in nighttime scenarios, but it is not suitable for daytime scenes.

✧ Please note that the image enhancement and fog removal effects cannot be used simultaneously, as the video frame rate will decrease in night vision mode.

3.3. visible light camera function

3.3.1. Zoom control

- Zoom: Supports up to 17x optical zoom.
- Focus mode: AF (Auto Focus) supported.

3.4. infrared camera

3.4.1. Pseudo Color Mode

- Pseudo-color mode: Supports 11 effects including White Heat, Radiant Gold, Iron Red, Rainbow, Soft Glow, Aurora, Red Heat, Jungle, Medical, Black Heat, and Golden Red.

3.4.2. gain mode

Supports two different mode options:

- High-resolution mode: Temperature measurement range-20°C to 150°C, with an accuracy of ±2°C or ±2% of the reading.

- Wide-range mode: Temperature measurement range is 0°C to 550°C, with an accuracy of ±3°C or ±3% of the reading.

3.4.3. FFC calibration

- Manual calibration: Set or retrieve the auto shutter switch, minimum shutter interval, maximum shutter interval, and auto shutter correction trigger threshold.
- Automatic calibration: When enabled, the infrared camera will automatically perform FFC calibration periodically.

3.4.4. Temperature measurement function

It supports point temperature measurement, area temperature measurement and global temperature measurement.

3.4.5. DDE

Digital enhancement technology improves image and contour clarity. Supports 0-3 DDE levels for setting or retrieval.

3.5. range measurement function

⚠️ After enabling the ranging function, avoid direct eye contact with the laser to prevent potential harm.

3.5.1. range mode

- Single measurement: When enabled, it performs a single measurement and reports the distance.
- Continuous ranging: When enabled, it will measure distances continuously at a fixed frequency and report the distance information.

3.5.2. frequency selection

- Supports 1/2/5 Hz.

3.6. Other features

3.6.1. memory card

- Supports microSD cards up to 128GB, compatible with FAT32 and ExFAT file systems.

3.6.2. watermark

- Supports custom watermarks to display load model, SN code, latitude/longitude, altitude, date, and time.

3.6.3. additional function

- Reset camera parameters: Restore camera settings to factory defaults with one click
- Auto-save camera settings: Save user-defined settings by default. The camera will automatically use the last saved settings when you reopen it.
- OSD customization: Supports OSD customization.

3.7. Pan-Tilt Function

3.7.1. pan-tilt control

- One-click return: Quickly resets the gimbal to its original center position, aligning with the camera's orientation.
- One-click downward: Quickly rotates the gimbal vertically downward.

3.7.2. pan-tilt control mode

- Follow: The pod's orientation remains constant relative to the nose.

- Lock: The pod's orientation remains fixed and does not rotate with the aircraft's nose.

- Manual: Control the pan-tilt rotation with up, down, left, or right commands.

- Speed control: The pan-tilt unit automatically adjusts rotation speed according to zoom ratio.

3.7.3. automatic drift correction

●The PTZ automatically calibrates drift during operation, correcting attitude deviations caused by hardware errors, environmental interference, or prolonged use. This ensures stable and precise posture control, thereby enhancing both the image quality and operational reliability of filming or surveillance.

4. Photoelectric Pod Operation Instructions

4.1. Structural Installation Instructions

- Remove the protective cover of the gimbal interface, then align the white dot on the pod's quick-release connector with the red dot on the aircraft's gimbal interface for connection.

- Rotate the pod connector clockwise to the locked position (aligning the pod with the aircraft's red dot) to secure the pod.

quick-release mating part

photoelectric pod   pod end quick disconnect
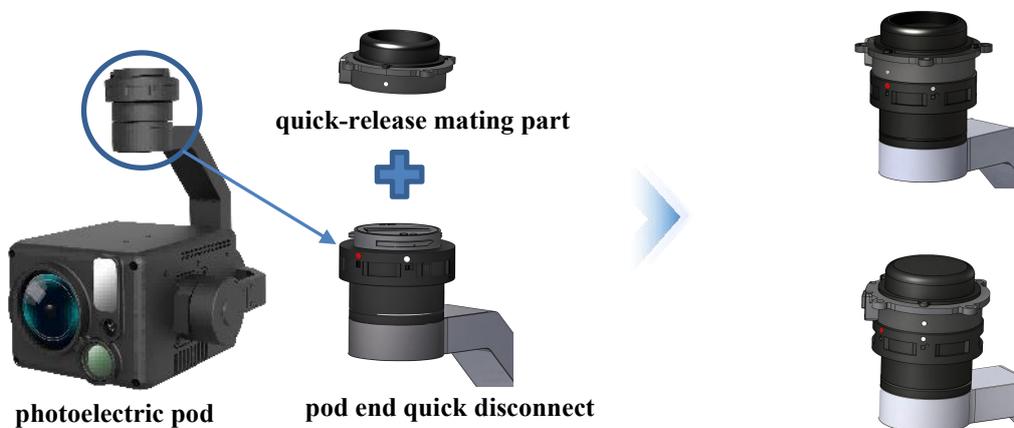
✧ To remove or replace the pod, press and hold the aircraft's unlock button, then rotate the gimbal camera counterclockwise.

4.2. Signal line description

4.2.1. 30-pin signal line pin definition

- This applies exclusively to the LF-H17A model. For the LF-H17A-ZY variant, please consult the Ziyang Aircraft Interface specifications.

Numbe	definition	explain	Wiring	remarks

r			harness color	
1	GND	GND	black	
2	USB-DP	USB-DP	green	
3	USB-DN	USB-DN	yellow	
4	GND	GND	black	
5	PPS	PPS	green	Accurate Time Synchronization time lock
6	CAN-P	CAN-P	green	
7	CAN-N	CAN-N	yellow	
8	GND	GND	black	
9	GND	GND	black	
10	SBUS	SBUS	green	
11	GND	GND	black	
12	RS422-RX-N	RS422-RX-N	yellow	
13	RS422-RX-P	RS422-RX-P	green	
14	RS422-TX-N	RS422-TX-N	yellow	
15	RS422-TX-P	RS422-TX-P	green	
16	VBAT	VBAT	red	10V ~ 28V
17	VBAT	VBAT	red	10V ~ 28V
18	VBAT	VBAT	red	10V ~ 28V
19	VBAT	VBAT	red	10V ~ 28V
20	GND	GND	black	
21	GND	GND	black	
22	GND	GND	black	
23	232-UART-RX	232-UART-RX	yellow	Input/3.3V
24	232-UART-TX	232-UART-TX	green	output /3.3V
25	LAN-RX-N	LAN-RX-N	yellow	
26	LAN-RX-P	LAN-RX-P	green	
27	LAN-TX-N	LAN-TX-N	yellow	
28	LAN-TX-P	LAN-TX-P	green	
29	GND	GND	black	
30	HIGHT-PWR-REQ	HIGHT-PWR-REQ	green	high power request

Note: The signal line number is the sequence number marked on the harness.

5. external communication protocol

You can contact sales or after-sales for relevant information.

6. Host machine tool

You can contact sales or after-sales for relevant information.

7. matters need attention

7.1. maintenance overhaul

7.1.1. Daily Use and Cleaning

● Dustproof and dirtproof

Avoid contaminating the lens with chemicals or oil during use. Clean the lens surface immediately after use with a lens cloth.

Direct wiping of optical lenses with hands or rough fabrics is prohibited. It is recommended to use professional lens cleaning kits or clean cloths and alcohol for cleaning.

● Moisture-proof and waterproof

Avoid prolonged use in rainy, snowy, or high-humidity environments. If exposed to damp conditions, wipe the surface with a dry soft cloth after operation and store in a dry environment.

Do not soak or rinse the device directly.

● collision and vibration protection

During transportation or storage, place the pod in the factory-provided explosion-proof box and keep it securely fixed to avoid violent shaking or dropping.

Do not impact the lens with sharp or hard objects, as this may cause damage and affect its performance.

7.1.2. matters need attention

● Do not disassemble by yourself

Non-professionals must not disassemble the pod's core components (e.g., optical modules or circuit boards), as doing so may cause damage or void the warranty.

● exception handling

If the device exhibits abnormal overheating, unusual noises, or image distortion, stop using it immediately and contact after-sales technical support.

Do not force the device to start in a faulty state.

7.2. Usage Notes

7.2.1. Preparation before use

● Environmental inspection

Maintain the operating environment temperature within-20℃ to 55℃, and avoid areas with strong electromagnetic interference.

The use is prohibited during severe weather conditions such as rain, snow, and sandstorms.

● equipment inspection

Check the pod for damage, the lens for stains, and the gimbal for smooth rotation without noise.

Inspect the mechanical structure of the flywheel gimbal for looseness. If any abnormal response is detected, immediately deactivate and perform maintenance.

Check the electrical connections of the system.

Check the normality of the gimbal imaging and function.

7.2.2. Usage Notes

If there are any abnormal situations such as abnormal picture or abnormal control of the pan-tilt unit during the operation, the operation task should be stopped and returned to the ground for inspection.

7.2.3. Post-processing

After use, the system must be powered down before removing the pod from the aircraft.

After cleaning the lens, it was put back into the packaging box.