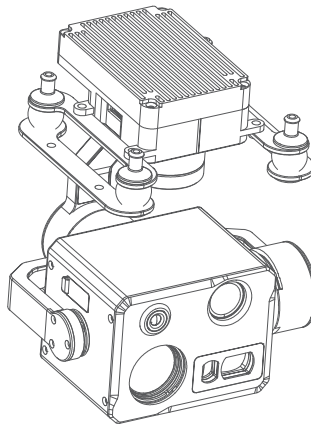
V 1.0 2026.05

H4T-19 Gimbal Camera

User Manual



Please scan QR code for more details, or visit our website:
www.viewprotech.com

Preface

Please read this manual carefully to ensure proper use of the product. Failure to follow the instructions may result in damage.

Do not disassemble or modify the gimbal under any circumstances, as improper handling may lead to malfunction.

Since we cannot control the user's specific usage, installation, modifications, or improper operation, we shall not be held liable for any direct or indirect damages or losses arising therefrom.

We assume no responsibility for any injury or loss, whether direct or indirect, resulting from the use of this product.

Safety Symbols:



Prohibited Operation



Important Notice

Safety Precautions

1. After use, store the gimbal in a dry environment to prevent lens fogging. If fogging occurs, power on the device and allow it to dissipate naturally.

2. When using the thermal imaging camera, do not aim it at high-energy sources such as the sun, laser beams, or molten lava. The target temperature must be below 800°C to avoid irreversible damage to the detector.

3. When cleaning the lens, use a soft, dry cloth only.

4. Do not touch or scratch the infrared lens coating with nails or hard objects to avoid damaging the coating and degrading image quality.

5. Do not insert or remove the TF card while the device is powered on. After removal or insertion, ensure the TF card slot cover is properly sealed to avoid startup errors.

1. Introduction

The H4T-19 is a four-sensor gimbal camera that integrates dual visible light camera, IR thermal imaging, laser rangefinder, and AI tracking. It features compact, lightweight design, and a 3-axis stabilized system ideal for UxS.

It includes one set 8K hybrid zoom camera (48MP 3.3x optical zoom tele camera + 48MP fixed lens wide angle camera), a 19mm 640x512 thermal imager, and a 1.2km laser rangefinder. It supports EO+IR image fusion and up to 160x EO hybrid zoom and 8x IR digital zoom, detailed visuals for both day and night operations.

Built-in AI computing enables real-time detection and auto-tracking of vehicles & people.

The H4T-19 supports Ethernet output and dual-channel storage: one channel supports high-res photo(48MP or 12MP optional) & 4K video recording, another supports 1080p video and images.

Applications: environmental monitoring, firefighting, inspection, public safety, etc.

2. Product Specifications

Overall Specification	
N.W.	435g
Product meas.	102.5*97.5*124.9mm
Input Voltage	12V
Dynamic current	1500~2500mA @ 12V
Power consumption	Average 18W, Max 30W
Working environment temp.	-20℃~+50℃
IP rate	IP4X
EO camera zoom capability	10x optical zoom, hybrid zoom 160x

Output	IP (RTSP/UDP 720p/1080p@25fps H264/H265)
Storage	TF card 1 (top slot)(Up to 256G,class 10, FAT32 format) TF card 2 (camera slot) (storage capacity within 512G, read and write speed A2 V30)
Picture in TF Card	TF card 1 (top slot): EO 1920*1080, IR 640*512 TF card 2 (camera slot): wide-angle camera 4000*3000, zoom camera 4000*3000
Video in TF Card	TF card 1 (top slot): 1920×1080 @ 25 fps TF card 2 (camera slot): Wide-angle camera 4K@30fps, Zoom camera 4K@30fps
Control method	S.BUS or TTL(either one, default is TTL) / TCP / UDP
Gimbal Spec	
Mechanical Range	Pitch/Tilt: -65°(Up)～135°(Down), Roll angle:±50°, Yaw/Pan: ±150°
Controllable Range	Pitch/Tilt: -45°～125°, Yaw/Pan: ±140°
Vibration angle	Pitch/Roll/Yaw: ±0.02°
One-key to center	√
Wide angle EO Camera Spec	
Image Sensor	1/2" CMOS (H: 6.4mm, V: 4.8mm, D: 8.0mm)
Pixel Size	0.80 μm (H) × 0.80 μm (V)
Resolution	48MP(8000*6000)
EFL	4.49 mm
Equivalent focal length	24.29 mm
Aperture	F2.8
Field of View (FOV)	D: 84° H: 70.2° V: 54.9°
Min illumination	Color 0.1 lux
Optical Distortion	2.50%

Optical zoom EO Camera Spec	
Image Sensor	1/2 inch CMOS (H:6.4mm, V:4.8mm, D:8.0mm)
Pixel Size	0.80 μm (H) × 0.80 μm (V)
Resolution	48MP(8000*6000)
EFL	15.3~49.7mm ±5%
Equivalent focal length	82.77-268.88mm, Aperture F3.7(W)~F4.6(T)
Field of View	D: 28.3°(W)~8.9°(T) H: 23.2°(W)~7.2°(T) V: 17.6°(W)~5.4°(T)
Min illumination	Color 5 lux
Optical distortion	1.6% (Wide) ~ 1.4% (Tele), @ ∅8mm
IR Thermal Imager Spec	
Focus Length	19mm
Horizontal FOV	22.9°
Vertical FOV	18.4°
Diagonal FOV	29.0°
Detection Distance (Man: 1.8×0.5m)	792 meters
Recognition Distance (Man: 1.8×0.5m)	198 meters
Identification Distance (Man: 1.8×0.5m)	99 meters
Detection Distance (Car: 4.2×1.8m)	2428 meters
Recognition Distance (Car: 4.2×1.8m)	607 meters
Identification Distance (Car: 4.2×1.8m)	303 meters
Working mode	Uncooled VOx long wave (8μm~14μm) thermal imager
Detector pixel	640×512
Pixel Pitch	12μm

Focusing method	Athermal prime lens
NETD	≤50mK@25℃, F#1.0
Color palette	White hot, black hot, Iron red
Digital zoom	1x ~ 8x
Radiometric function (Optional)	Thermometry range optional: -20℃~+150℃, +100℃~+550℃
	Thermometry accuracy: ±3℃ or +3% of reading (whichever is greater) @ ambient temperature -20℃~60℃

Camera Object Tracking

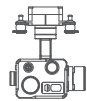
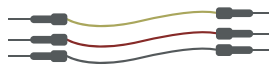
Update rate of deviation pixel	30Hz
Output delay of deviation pixel	<30ms
Minimum object contrast	5%
Minimum signal-to-noise ratio	4
Minimum object size	16*16 pixels (at 1080P resolution). The target size is positively correlated with the resolution.
Maximum object size	Unrestricted
Tracking speed	≤ 0.25 * target size / frame
Object memory time	Default is 2 seconds (customizable, 2-4 seconds recommended)

Camera AI Performance

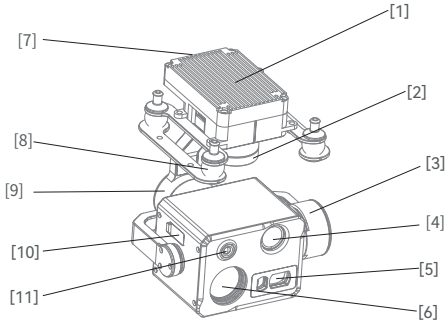
Targets type	Car and human
Simultaneous detection quantity	≥ 100 targets
Min contrast ratio	≥5%
Min target size	20*10 pixels (at 1080P resolution), the recognized target size is linearly and positively correlated with the resolution.
Car detection rate	≥85%
False alarm rate	≤10%

Laser Rangefinder	
Range	5~1200m
Accuracy	±1m
Light Beam	905nm pulse laser
Divergent Angle	~6 mrad
Laser pulse frequency	1~4Hz
Eye safety level	Class1
Working power	≤2W
Rangefinder	Measure the distance between the object at the center of screen and the laser rangefinder

3.1 Packing List

Gimbal Camera ×1	
Aluminum Standoffs ×4	
USB to TTL Cable ×1	
M3 Screws ×8	
Damping Ball ×1	
Power Cable ×1	
Serial Port Cable Connection ×1	
Ethernet Cable ×1	
Serial Port (UART) Cable ×1	

3.2 Gimbal Component Diagram



【1】Control Box
【2】Yaw Axis Motor
【3】Pitch Axis Motor
【4】Zoom Lens
【5】Laser Rangefinder
【6】IR Thermal Camera
【7】TF Card Slot 1
【8】Damping Ball
【9】Roll Axis Motor
【10】TF Card Slot 2
【11】Wide-Angle Lens

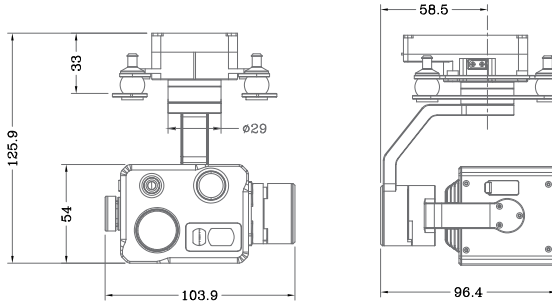
Please ensure that no objects (such as TF card rubber plug) obstruct the gimbal's motor during rotation.
If any obstruction occurs during operation, remove it immediately.

Avoid pointing the thermal camera directly at the sun.

Minimum 5meters away from the target or obstacle when test indoors in case burning the LRF.

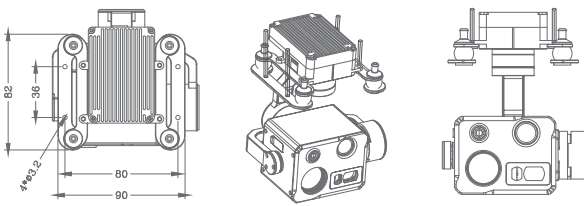
3.3 Dimensional Diagram

Unit: mm



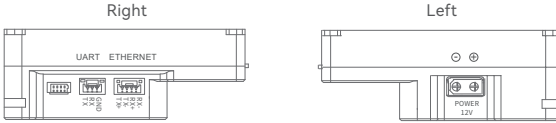
3.4 Installation

Installation Example



Note Use the included 8 * M4 screws and 4 * aluminum standoffs for installation. For simulation installation, please contact Viewpro to request the simplified 3D model file.

3.5 Hardware Interfaces



Port Name	Connector Type	Description
POWER 4S~6S	XT30	Power input: 14.8V~25.2V. Red = Positive, Black = GND.
ETHERNET	4-pin GH1.25mm	Ethernet interface for video streaming and gimbal control. Connect directly to receiver device (e.g., PC or video transmitter).
UART	3-pin DuPont Header	Serial interface for gimbal control. TX-RX crossed connection, GND to GND.
DEBUG	4-pin SH1.0mm	Gimbal Debug Interface

4.1 Viewlink Installation

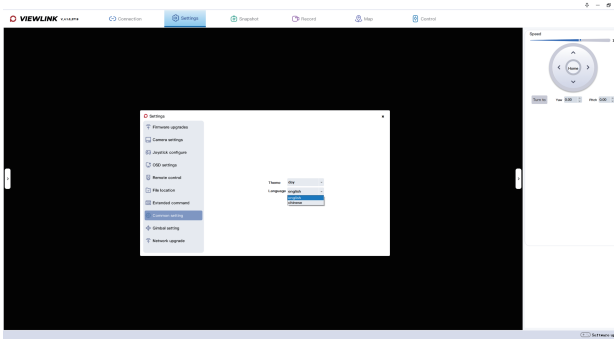
Viewlink is a professional and user-friendly control software developed by Viewpro. It allows for real-time video streaming, gimbal control, configuration, and firmware upgrade.

Download from: https://www.viewproonline.com/pages/softwares

Operating System: Windows 10 (64-bit) or later

Note: SDK available for OEM software developing.

4.2 Accessing Viewlink



【 Viewlink Interface 】

Theme Options: day / night

Language Options: Chinese / English

To apply changes, restart the software after selecting theme and language in “Common Settings.”

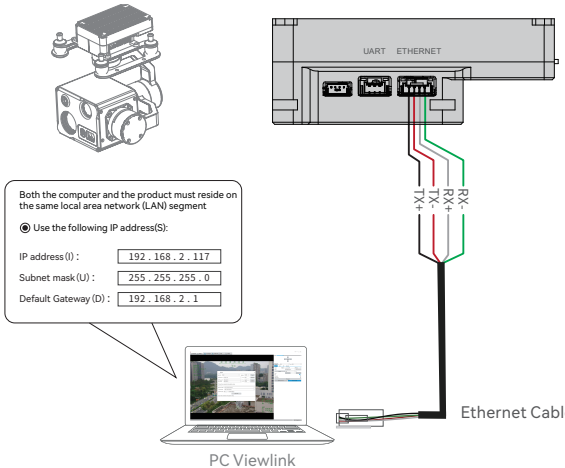
4.3 Device Connection

4.3.1 Ethernet Connection

Gimbal Default IP: 192.168.2.119

Default Gateway: 192.168.2.1

Note: Ensure your PC’s network is in the same IP segment to establish a connection.

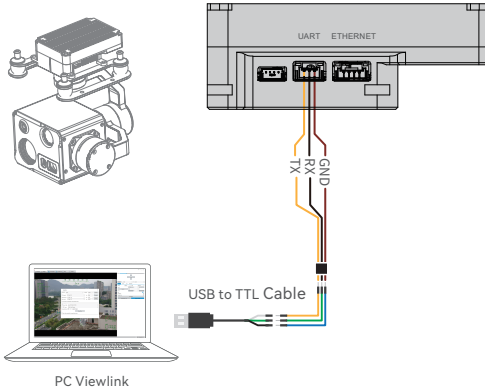


【 Direct Network Connection to PC Diagram 】

4.3.2 UART (Serial Port) Connection

Gimbal		USB to TTL cable
TX	⟷	RX (white)
RX	⟷	TX (green)
GND	⟷	GND (black)

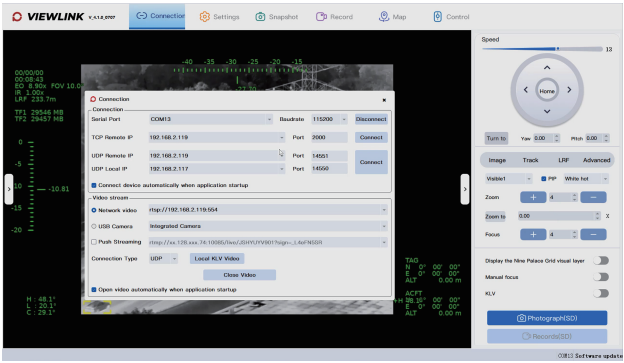
Baud Rate: 115200, 8, 1 TTL



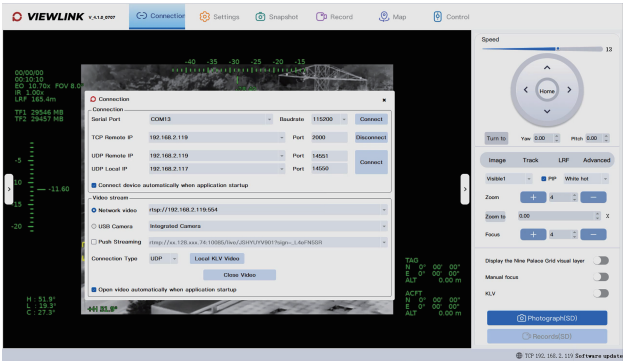
【 Serial to PC Direct Connection Diagram 】

4.3.3 Viewlink Connection

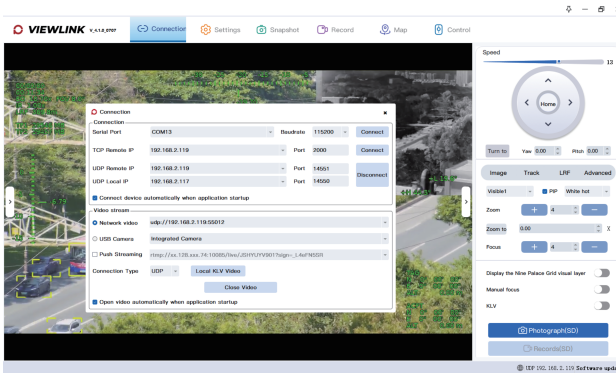
Control Interface	Parameters	Notes
UART (Serial Port)	Default: Baud rate 115200	Baud rate is fixed and cannot be changed
TCP (Network)	Default IP: 192.168.2.119 Port: 2000	Port 2000 is fixed and cannot be changed
UDP (Network)	Remote IP (Gimbal): 192.168.2.119 Port: 14551 Local IP (PC): 192.168.2.117 Port: 14550	Local port 14550 is fixed and cannot be changed
Video Streaming Address	Default RTSP URL: rtsp://192.168.2.119:554 Default UDP URL: udp://192.168.2.119:55012	RTSP port 554 is fixed and cannot be changed



【Successful Serial Connection Diagram】



【RTSP Video and TCP Control Connection Diagram】



【 UDP Video and Control Connection Diagram 】

4.4 Viewlink Control

4.4.1 Gimbal Control



【 Gimbal Rotation Interface 】

- Use arrow buttons to control gimbal movement and adjust speed
- Enter specific angles for quick positioning
- Click “Home” to reset the gimbal to its initial position
- Double-click “Home” quickly → Gimbal faces downward

Hold the left mouse button and drag on the screen to activate a small white circle. While holding the button, move the circle to shift the gimbal camera’s view in the corresponding direction.

Tip: In tracking mode, click-drag is disabled

4.4.2 Image Control

- EO/IR Switch: Choose Visible1 or IR as the main screen

  PIP: Picture-in-picture dual images mode

  Color Modes (IR) Options: White Hot, Black Hot, Iron Red

- Zoom:

  1–3.3x: Wide lens

  3.3–10x: Telephoto

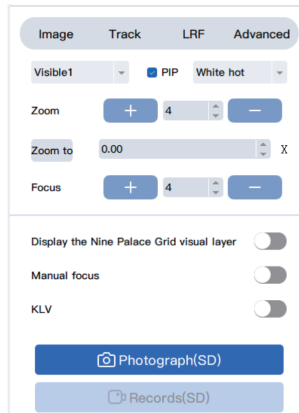
  10–160x: Digital zoom

  Use +/- buttons or mouse wheel to control zoom gradually. You can also input a number after “Zoom to” to zoom to a specific x directly. The number between +/- buttons is for zoom speed.

- Photo/Video Recording:

  Requires TF card in the correct slot before using the photo or video functions. All recordings will be saved to the TF card.

  The OSD will display “no TF” if no card is detected.



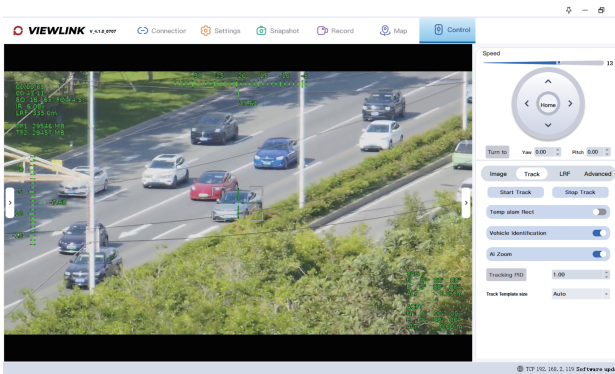
【 Camera Control Interface 】



【 Advanced – Thermal Digital Zoom Button 】

- IR DZoom - S: Stepped zoom (1x, 2x... 8x)
- IR DZoom - C: Continuous zoom

4.4.3 Tracking Control



【 Tracking Control Interface 】



【 AI Recognition Interface 】

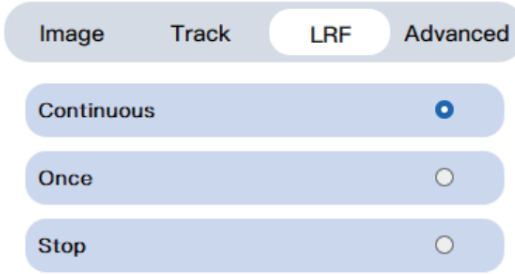
- Tracking Method 1:
  Click “Start Track” to begin track. A tracking box will appear at the center of the screen, indicating that the object inside is being tracked. Click “Stop Track” to exit tracking mode.
- Tracking Method 2:
  Left-click directly on the target in the video to initiate track. Right-click to cancel the tracking.
- AI Zoom:
  Automatically adjusts the zoom level based on the size of the AI tracking target, keeping the target at a proper size in the frame.
- Track Template Size:
  Selectable tracking box sizes: 32×32, 64×64, or 128×128 pixels.

4.4.3 Tracking Control

Supports three modes: Continuous, Once, and Stop.

The OSD will display LRF-measured distance in meters, with an effective range of 5–1200 m.

Note: When not in use, please set the mode to Stop to ensure LRF safety and prolonger service life.



【 Rangefinder Control Interface 】

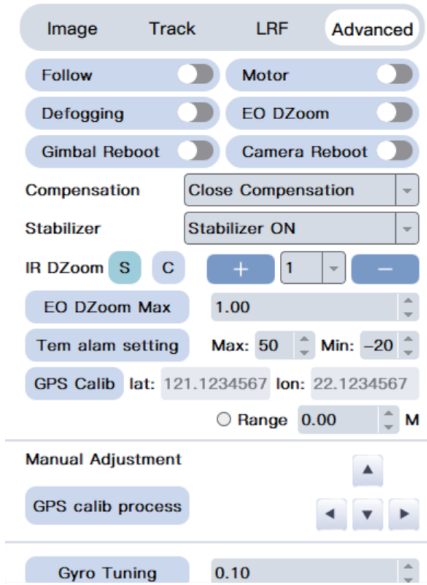
4.4.5 Advanced Control

- Follow:
  When enabled, the gimbal's yaw axis will follow the aircraft's heading.
  When disabled, the yaw will remain independent from aircraft movement.

- Motor:
  Turns the gimbal motors ON/OFF.

- Gimbal Reboot:
  Restarts the gimbal software. Useful when the gimbal becomes unresponsive or abnormal.

- Compensation:
  By default, the gimbal operates in Compensation Off mode.
  Under specific flight conditions (see Section 6.1), you may enable Heading and Speed Compensation Mode to correct image tilt during motion.



【Advanced Control Interface】

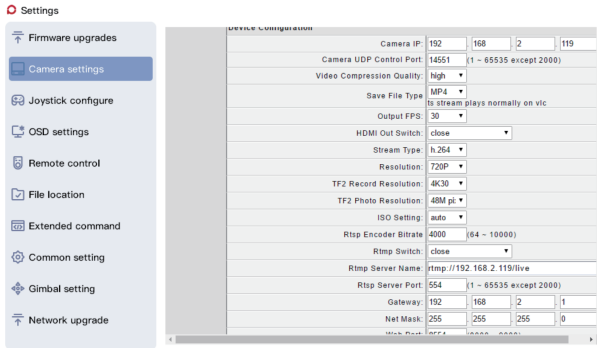
5. Product Settings

USER MANUAL

You can change the cameras settings according to your needs.

5.1 Camera Settings

5.1.1 Change Camera IP Address



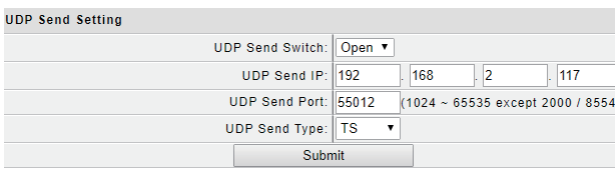
【 Settings – Camera Settings – Change IP 】

Default IP: 192.168.2.119 Change to: 192.168.144.119

Default	Modify	Save
Camera IP:192.168.2.119	Camera IP:192.168.144.119	Submit
Gatway:192.168.2.1	Gatway:192.168.144.1	Submit

Note: Ensure that the video streaming device IP is in the same segment as the H4T-19. Changes take effect after a Reboot or power cycle.

5.1.2 Change Camera UDP Video Stream



Parameter	Description
UDP Send Switch	Enable UDP stream (default: OFF)
UDP Send IP	Receiver IP address (e.g., PC IP)
UDP Send Port	Receiver port number
Submit	Save parameters after modification

5.1.3 Camera Photo Settings

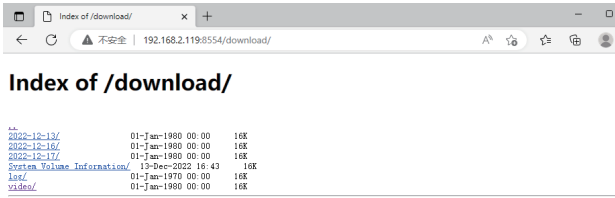
TF Card 2:
Visible light camera supports photo resolution settings: 12MP or 48MP



【 Encoding Settings – Photo Resolution Settings 】

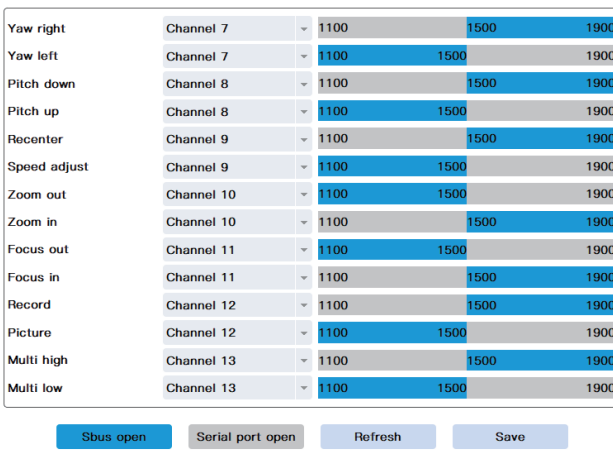
5.1.4 Downloading Photos/Videos

Enter http://192.168.2.119:8554 in a browser to access TF Card 1 for browsing and downloading files.



【HTTP Access】

5.2 S.bus Settings



Channel Definition:

Function	Default Channel No. (1–15, configurable)	RC Signal Pulse Width Action	Reverse
Yaw Right / Yaw Left	Channel 7	1.5 ms – No action 1.5→1.1 ms – Yaw Left 1.5→1.9 ms – Yaw Right	Blue indicates the pulse-width response; click the gray half to reverse.
Pitch Up / Pitch Down	Channel 8	1.5 ms – No action 1.5→1.1 ms – Pitch Up 1.5→1.9 ms – Pitch Down	
Recenter / Speed Adjust	Channel 9	1.5 ms – No action 1.5→1.1 ms – Speed Down 1.5→1.9 ms – Recenter	
Zoom In / Zoom Out	Channel 10	1.5 ms – No action 1.5→1.1 ms – Zoom Out 1.5→1.9 ms – Zoom In	
Focus – / Focus +	Channel 11	1.5→1.1 ms – Switch PiP 1.5→1.9 ms – Switch Thermal Palette	
Record / Capture	Channel 12	1.5 ms – No action 1.5→1.1 ms – Capture 1.5→1.9 ms – Record	
Backup Channel High / Low	Channel 13	1.5 ms – No action 1.5→1.1 ms – Thermal Digital Zoom (1x, 2x, 3x, 4x) 1.5→1.9 ms – Track Center Target	

Note: Recenter Function Additional Features:

Single click – Gimbal recenters

Double quick clicks – Gimbal tilts downward

Triple quick clicks – Gimbal enters lock-head mode

Quadruple quick clicks – Gimbal enters follow mode

Mode Configuration

Refresh: Reads the current configuration

S.bus open: Selects S.bus mode (highlighted in blue when enabled)

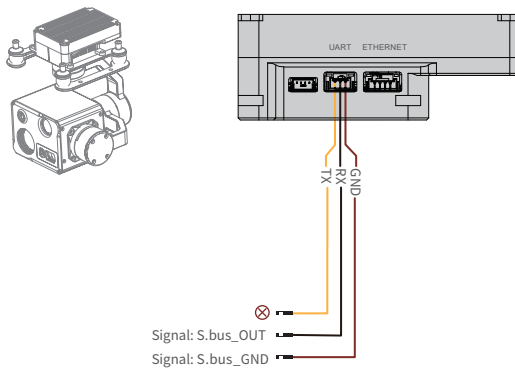
Serial port open: Selects serial port mode (highlighted in blue when enabled)

Save: Saves configuration, takes effect after reboot.

Wiring (S.bus & UART share hardware interface):

S.bus_OUT → UART_RX

S.bus_GND → UART_GND



The H4T-19 gimbal camera has two firmware modules:

Control Firmware

H4T-25-20250710.bin	2025/7/11 11:03	BIN 文件	111 KB

Camera AI Firmware

VP-A6-LU_EM4TR19V20250717190104.zpk	2025/7/17 19:01	ZPK 文件	38,804 KB

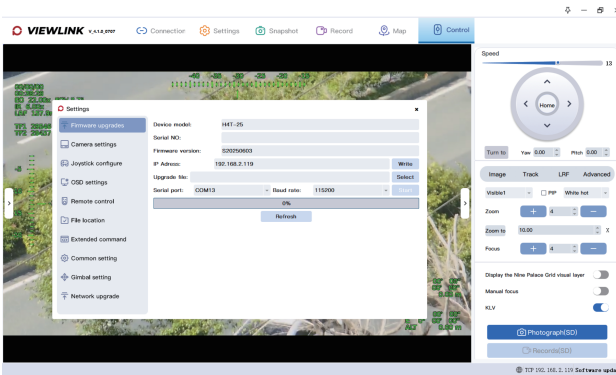
6.1 Control Firmware Upgrade

- **Method 1 (Recommended): TF Card Upgrade**

1. Rename the file H4T-19-xxxxxxxx.bin to S303M32.bin.
2. Place “S303M32.bin ”in the root directory of a FAT32 formatted TF card.
3. Power off the gimbal camera.
4. Insert the TF card into TF card slot 1.
5. Power on the gimbal.
6. Wait for the message:
"Find Firmware, connecting..."
After a short time, you should see:
"Firmware update success"
7. Power off to complete the process.

- **Method 2: Viewlink Upgrade**

1. Connect the gimbal camera via serial port.
In Viewlink, go to Settings → Firmware Upgrade.
2. In the “Upgrade File” section, navigate to the path where the H4T-19-xxxxxxxx.bin file is stored on your PC. Select the file, click “Open”, then click “Start” to begin the upgrade.
3. Power off the gimbal to complete the process
A progress bar will indicate the upgrade.
Once completed, the message "Upgrade successful!" will appear.



【 Firmware Upgrade Control Interface 】

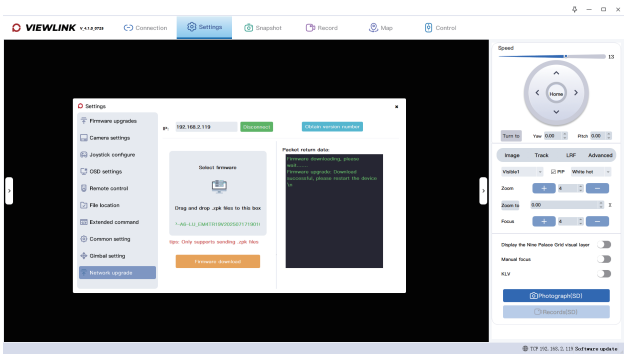
6.2 Camera AI Firmware Upgrade

- Method 1 (Recommended): TF Card Upgrade

1. Format the TF card to FAT32.
2. Copy the file VP-A6-LU-xxxxxx.ZPK to the root directory of the TF card.
3. Power off the gimbal camera.
4. Insert the TF card into TF card slot 1.
5. Power on the gimbal.
6. Wait for 3 minutes.
7. Power off — upgrade is complete.

- Method 2: Viewlink Network Upgrade

1. Connect the gimbal camera via Ethernet.
In Viewlink, go to Settings → Network Upgrade.
2. Input the gimbal camera's IP and click Connect.
3. Click the PC icon to select the "VP-A6-LU-xxxxxx.ZPK" firmware file.
4. Click Download Firmware.
5. Wait until "Download successful, please reboot" is displayed.
Power off to complete the process.



【 Camera AI Firmware Update Interface 】

7. FAQ

USER MANUAL

Q1: Forgot the camera IP after changing it?
To restore the default IP (192.168.2.119):
1) Format a TF card to FAT32. (If it is already FAT32, formatting is not necessary.)
2) Copy the file systemconf_def.ini to the root directory of the TF card.
3) Power on the gimbal and wait for 3 minutes, the IP address will automatically reset to 192.168.2.119.
4) Power off the gimbal.
5) Confirm that the file systemconf_def.ini is disappeared from the card — this means the reset was successful.
6) Insert the card back and power on. The IP should now be restored to 192.168.2.119.

Q2. About Video Recording on the TF Card
After recording, stop the recording first, wait a few seconds, then power off. This avoids file corruption due to incomplete save.
TF Card Slot 1: Built-in TF card interface used to store 1080P resolution photos and 4K videos.
TF Card Slot 2: Built-in TF card interface used to store visible light ultra-high resolution photos at 12MP or 48MP and 4K videos.