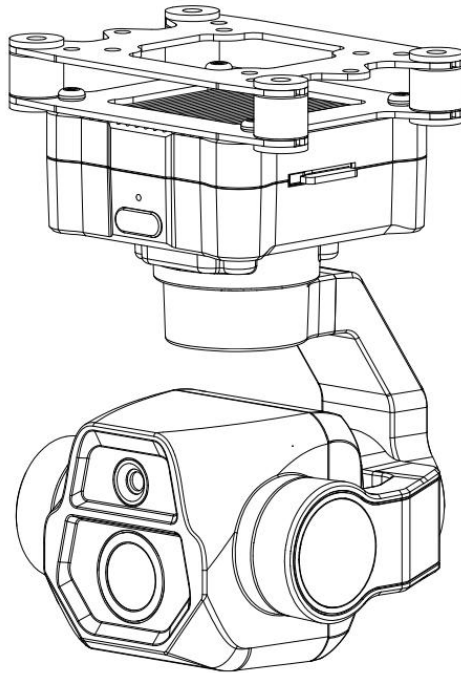


INYYO A2W

User Manual

V1.5 2026/10/13



Product safety awareness is crucial for your safety, the safety of those around you, and the environment.

Please read the "User Manual" carefully. Parameters of this product may be updated and iterated frequently. Please refer to the latest version V1.5. The final interpretation rights of this document and all related documents belong to the product developer.



Keyword Search

Electronic documents can use the search function to search for keywords. In common office software, Windows users can use the shortcut key Ctrl+F, Mac users can use Command+F to search for keywords.

Click on the directory subtitle to jump



Users can click the subtitle in the directory to jump to the corresponding pages.

Printing

This document supports low/medium/high quality printing.

Reading Tips

Symbol Explanations



Prohibition



Key Attention or Warning



Reminder



Note



Disclaimer

·Neither this product nor its developer/manufacturer/distributor shall be liable for any damage, injury, or legal liability directly or indirectly caused by the use of this product. Users shall comply with all safety guidelines including but not limited to those mentioned in this document.

·This product is originally designed solely for legal civil applications and not for military purposes. Any activities conducted by users using this product are their personal behaviors and have no connection with the product's developer, manufacturer, or distributor.

·Due to the relatively fast update and replacement cycle of products in this category, slight deviations between the final physical product and the technical parameters are considered normal.

·The final interpretation right of this document and all related documents belongs to the developer of this product. For any updates, no separate notice will be given.



Important Notes

- Please read this manual carefully before using the product and operate it strictly in accordance with the manual.
- Do not attempt to disassemble, modify, or repair the product by yourself. If necessary, please contact the distributor.

- For after-sales service, please contact the distributor. For details, refer to the relevant after-sales service content in this document.

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Product Introduction

This chapter mainly introduces the functional features, technical specifications, component names of the main core modules of this product, and general precautions for using this product.

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Product Introduction

Overview

- The INYYO A2W integrates perception, stabilization, positioning, and intelligent recognition into a single all-in-one system, with deep hardware-software collaboration optimization. Its simple and intuitive operation logic allows for quick deployment without complex debugging, significantly enhancing the execution efficiency and operational precision of field reconnaissance missions.
- The INYYO A2W is precision-molded and machined, featuring outstanding strength, efficient heat dissipation, and excellent vibration absorption, rain resistance, dustproofing, and corrosion resistance, making it suitable for various harsh outdoor operational environments.
- The advanced three-axis orthogonal stabilization gimbal works in synergy with the host platform, with a high-speed processor precisely controlling motor operation. It features a high steady-state frequency, accurately compensating for minute movements to stabilize the camera's shooting angle.
- The A2W is equipped with an advanced AI chip featuring an integrated NPU, enabling high-precision real-time detection and tracking of ground targets within its visual range, effortlessly executing reconnaissance and surveillance missions.
- The uniquely designed 3D visual positioning system can real-time calculate the latitude and longitude coordinates, elevation, and distance information of the center point in the image, and transmit real-time data via serial and network ports. It demonstrates excellent application value in remote distance reconnaissance, precise measurement of control point coordinates, and overview of line-of-sight areas.
- The lens is equipped with dynamic resolution technology, capable of accurately capturing and rendering highlights and shadow details in dynamic scenes, ensuring natural brightness and color reproduction while delivering comprehensive clarity of image details across various scenarios.

·The control module is externally selected with high-quality materials, featuring excellent safety characteristics such as high-temperature resistance and corrosion resistance. It prevents current leakage and short circuits, ensuring stable and reliable electrical connections with a longer service life.

·Integrated control module structure significantly enhances connection strength, delivering a seamless experience through intelligent design. Equipped with multiple optimized one-touch functions, it ensures effortless operation.

·Compatible with various mechanical platforms, multiple peripheral connection options ensure unrestricted usage.

 Please refer to the technical index of this paper for the actual use environment and specific parameters.

Technical Specifications

Main Parameters	
Material	Nylon + fiberglass
Pod Dimension	60.3 (L) × 60 (W) × 96.3 (H) mm
Pod Weight	126 ± 10 g
Operating Temperature	-10°C ~ 55°C
Storage Temperature	-25°C ~ 55°C
Protection Class	IP43
Image Stabilization Axes	3 Axes (Yaw/Pitch/Roll)
Installation Mode	Top-mounted / Bottom-mounted (Default) / Front-mounted
Input voltage	12V
Angle of operation range	-145° ~ 145° (yaw); -110° ~ 25° (pitch); ±30° (roll)
Control signals	TTL serial communication, TCP, UDP, SBUS
Gimbal Operation Modes	Enable Follow (Default); Disable Follow; FPV Mode; One-Key Downward
Gimbal Control Modes	Speed Control; Angle Control; Point-and-Shoot Movement; object tracking
Zoom factor	24X
Video Interface	Ethernet Port
Image Storage Format	JPG
Video Storage Format	MP4
Video encoding type	H.264/H.265
Video output format	1280*720@30fps/1920*1080@30fps
Micro SD	32GB (minimum)/512GB (maximum) (requires an SD storage card compliant with the SD 3.0 specification and formatted with the FAT32 file system)
Visible light short focus camera	
Resolution	2968×1672
Sensor size	1/2.65 " Progressive Scan CMOS

Equivalent focal length	48.7mm
Aperture	2.2±10%
Field of viewD×H×V(°)	D53° H47° V27.7°
Visible light telephoto camera	
Resolution	2968×1674
Sensor size	1/2.65 " Progressive Scan CMOS
Equivalent focal length	179mm
Aperture	2.4±10%
Field of viewD×H×V(°)	D15° H13° V7°
Target positioning function parameters	
Target positioning method	Screen center point positioning (requires GPS information reception)
Target solution accuracy	≤ 15m (under non complex terrain conditions)
Coordinate output type	latitude and longitude

■ Description of PTZ working mode

1. Enable Follow (default mode): The gimbal heading axis moves in real-time with the horizontal orientation of the current mounting platform. After the horizontal orientation of the mounting platform rotates, the gimbal will slowly correct the current heading axis position in real time, with a correction time of about 6 seconds. After confirming a complete reset, it will stop.
2. Disable following: Lock the plane position of the current gimbal heading axis and no longer follow the horizontal orientation of the current mounting platform. Temperature drift in this mode is a normal phenomenon and is generally used for surround shooting.
3. FPV mode: The gimbal three-axis moves in real-time with the orientation of the current mounting platform. After the orientation of the mounting platform rotates, the gimbal will slowly correct the current heading axis position in real-time, with a correction time of about 6 seconds. After confirming a complete reset, it will stop.
4. One click down: Move the pan tilt axis to -90 ° and maintain a one click down posture, which is used for capturing orthophoto images.

■ Description of PTZ control mode

1. Speed control: Control the gimbal to move in a certain direction at an adjustable speed.
2. Angle control: Control the pan tilt to a fixed angle, this function is limited to command control.

3. Pointing movement: Control the pan tilt to rotate to a specified visual position based on the XY coordinates of the screen. This function is limited to command control.
4. Target tracking: Automatically control the gimbal to stabilize the selected target at the center point of the screen in real time. During the tracking process, the user cannot manually control it. After canceling the tracking, the tracking mode can be exited.

■ Camera Zoom Control Mode Description

Multiple control: Control the visible light camera to zoom to a fixed multiple, this function is limited to command control.

The manual control rate can adapt to the magnification of the optical module, making it easy for users to achieve a good control experience at high magnification.

■ Target tracking mode description

Recognition and tracking: The gimbal is based on high-precision tracking of typical target detection/recognition results supported by AI (typical target models are trained based on the aircraft's overhead view, and detection rates cannot be guaranteed from other views), locking the target's motion trajectory throughout the entire process to ensure continuous and stable tracking and observation.

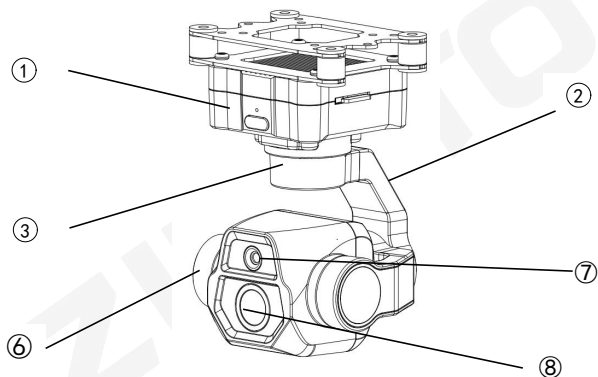
■ Target location function description

After entering the specified receiving protocol, the electro-optical pod will automatically locate the center point target on the screen (to be used when the pitch axis is rotated below -30°), and output the latitude and longitude coordinates of the target in the feedback data and OSD display.

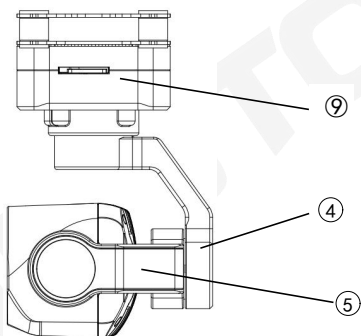
 Due to the rapid updates and iterations of this type of product, it is normal for there to be some deviations between the actual product and the technical parameters.

Main Part Description

■ Pod body:

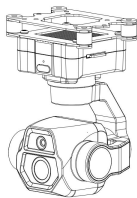


① Control module	② Heading arm	③ Heading servo motor
④ Roll servo motor	⑤ Roll arm	⑥ Pitch servo motor
⑦ Short focus camera	⑧ Long focus camera	⑨ SD card slot



⚠ Due to the rapid updates and iterations of this type of product, it is normal for there to be some deviations between the actual product and the technical parameters.

Packing List



Pod Main Unit × 1



Power Cable × 1



Ethernet Cable × 2



Serial port cable x 1

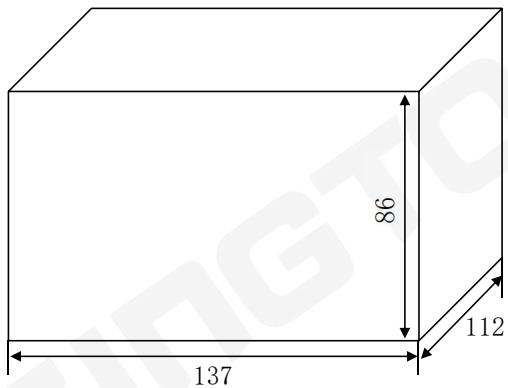
■ Example of Product Main Unit Packaging Box:

Type of packaging box: Tiandi Box

Inner liner of packaging box: filled with pearl cotton

Packaging box size: 137 (length) x 112 (width) x 86 (height) mm

Packaging box weight: 160 ± 20g



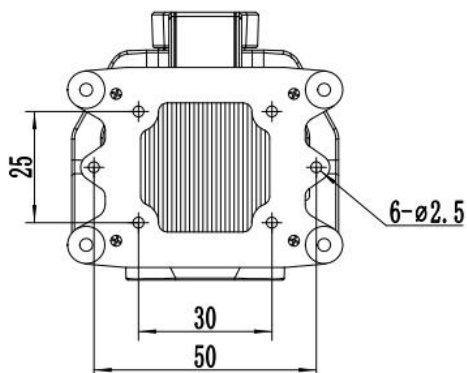
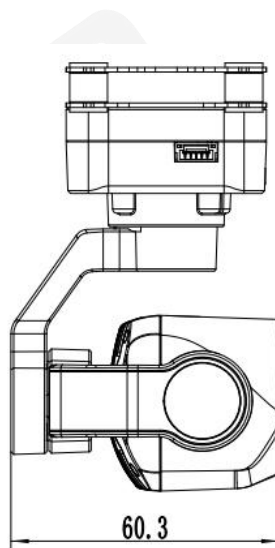
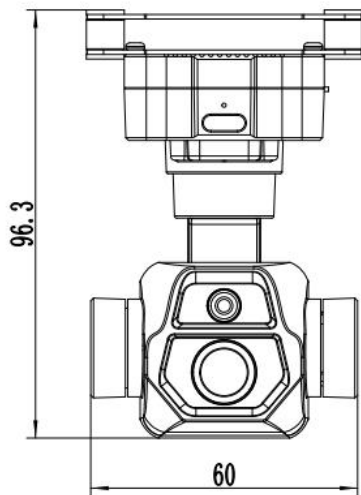
•Due to different user environments and platform interfaces, please equip other cables according to the electrical interface definition in this article. We apologize for any inconvenience caused!

💡 The above is the default packaging list for this product. If you have any other accessory requirements, please contact the distributor.

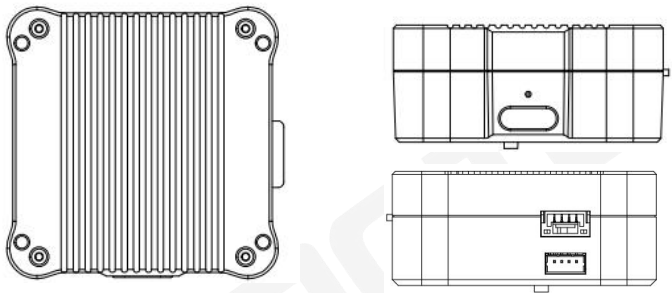
Mechanical Dimensions (Unit: mm)

■ Pod Main

Unit:

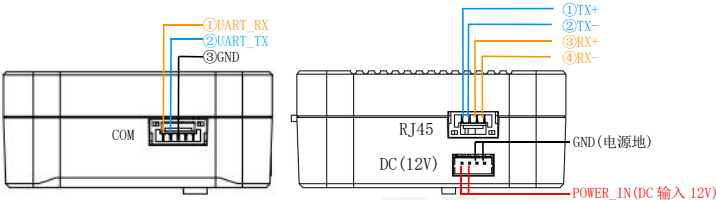


■ **12V Single Ethernet Port Output Control Module (Default):**



Interface Definition

■ **12V Single Ethernet Port Output Control Module (Default):**



Note	
DC(12V)	Power interface, please do not input voltage beyond the supported range.
RJ45 Ethernet Port	Connection diagram/data transmission, used for reading videos or controlling TCP and UDP instructions.
COM (UART Serial Port)	Connection diagram/data transmission or flight control, used for serial command control and data reading, default is TTL.

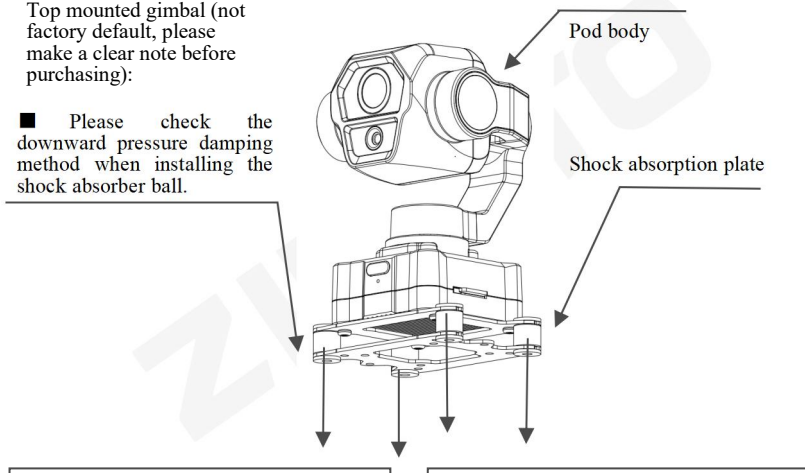
💡 The default configuration at the factory is a 12V output control module.

Installation Method

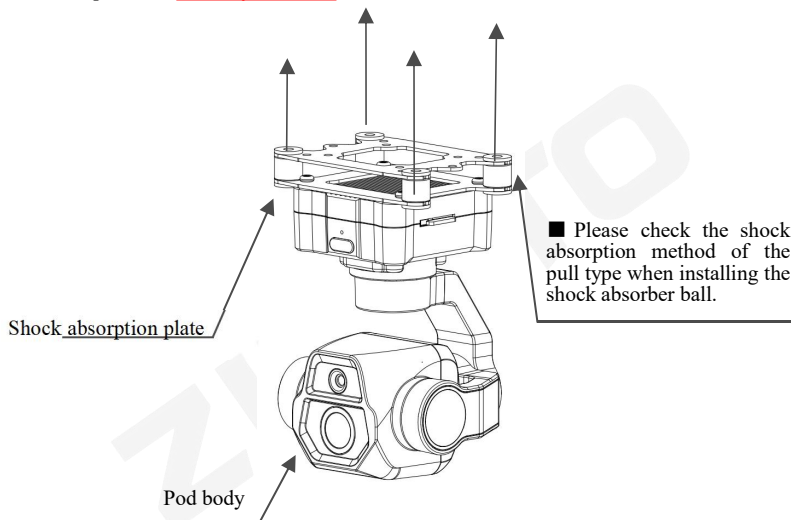
■ Control Module and Mounting Platform:

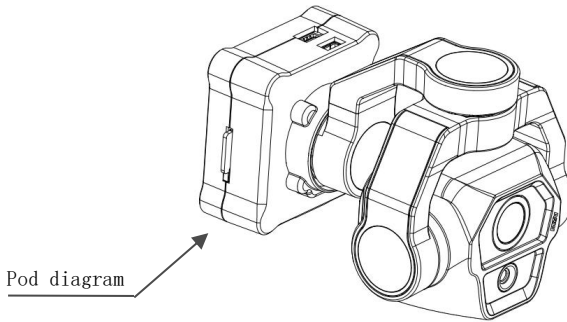
Top mounted gimbal (not factory default, please make a clear note before purchasing):

■ Please check the downward pressure damping method when installing the shock absorber ball.



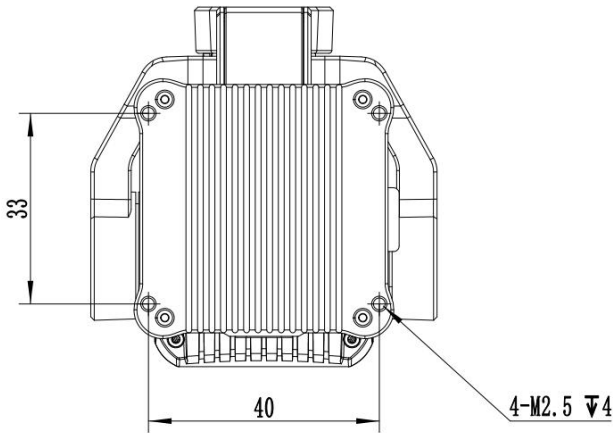
☆Bottom gimbal (factory default):





Pod diagram

■ The installation of the front mode requires the removal of the carbon plate and shock absorber ball, and directly uses screws to securely connect the pod to the installation platform.



Users need to drill holes and install optoelectronic pods on the platform themselves.

General Note

Strictly follow the electrical interface definition in this article to confirm the **power supply voltage**.

Do not input voltage beyond the supported range, otherwise it will burn out the equipment

Be prepared.

- Please use a voltage reduction module to power the control module, confirm the **positive and negative poles of the power supply**, and do not connect them in reverse.
- Before using 3S lithium batteries for power supply, please confirm that their output voltage is normal (**11.8-12.6V**).
- When a serial port is required to control the pod, please **do not input voltage through the serial port terminal**, otherwise it may cause damage to the pod control board.
- When installing the shock-absorbing ball, please **check if the shock-absorbing method is pull type (lower pan tilt)**, otherwise it may cause serious consequences such as falling and damage.
- Ensure that **there are no obstructions within the range of motion of the gimbal**, otherwise it may cause serious consequences such as malfunction or even burning of the gimbal.
- **Do not add other items such as light shields or counterweights**, as this may result in poor performance of the gimbal and even serious consequences such as burning.
- **Please do not remove the SD card during the shooting or recording process**, otherwise the images obtained during the shooting process may be lost.
- Please keep the **lens clean** and gently wipe it with a dust-free eyeglass cloth. A dirty lens may cause blurry images.
- Please do not disassemble or repair it yourself, otherwise you will not be able to enjoy warranty services.

 Users must strictly follow the safety precautions and operating instructions in this article. Any non-standard operation may cause serious accidents and the user shall bear corresponding responsibilities.

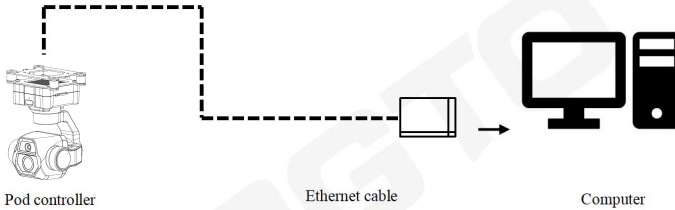
Product Use

This chapter describes the channel definition, network port Settings, modifying IP addresses and coding configurations, and command protocols.

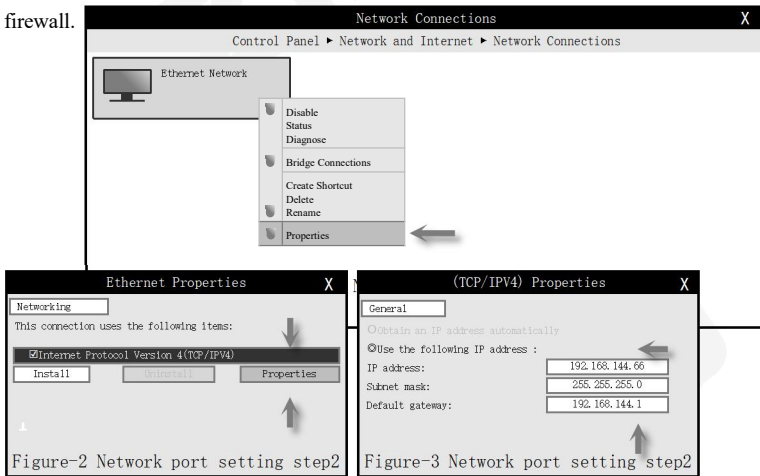
[>Click here to return to Table of contents <](#)

Product Use

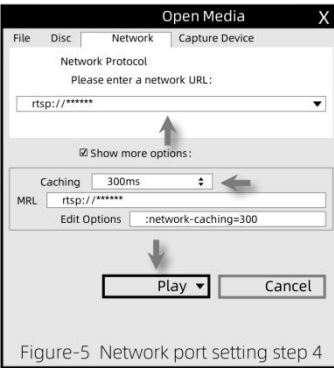
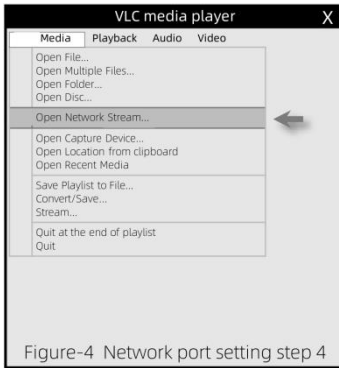
Network Port Setting



1. Take the PC as an example (you can flexibly connect other link devices based on your requirements), connect the cable to the network port of the PC, and disable the firewall.



2. Open "Network" on the computer, select "Network and Inter Settings", then select "Change Adapter Options", and finally select "IPv4" in "Ethernet" to modify the computer website, ensuring that the computer and the pod are in the same network segment, as shown in the figure.
3. After setting up the network segment of the computer, enter the URL (default) 192.168.144.119 in the browser to enter the configuration interface, where you can set the video streaming address, URL, port number, compression format, and bit rate.



4. Open VLC media player (Download software by yourself), Enter the pod RTSP video (default) address:

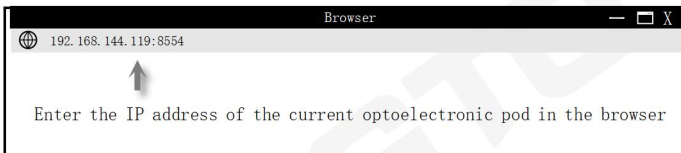
□ <rtsp://192.168.144.119:554/live0>

“Caching” input “300ms” for better video effect.

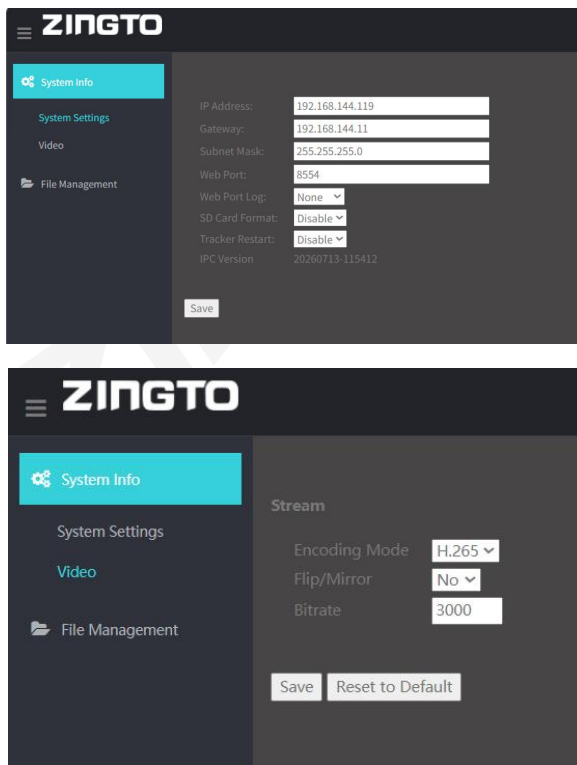
5. TCP default control port: [2000](#)

■ Modify IP address and video encoder configuration:

① Provide normal power to the pod, connect the network port to the computer, and log in to the encoded configuration website page 192.168.144.119 (192.168.144.119 is the current IP address of the electro-optical pod).



② Enter the encoding configuration page, and the basic information on the configuration page is as follows:



The image displays two screenshots of the ZINGTO web interface. The top screenshot shows the 'System Info' page, which includes a sidebar with 'System Info', 'System Settings', 'Video', and 'File Management'. The main content area contains fields for IP Address (192.168.144.119), Gateway (192.168.144.11), Subnet Mask (255.255.255.0), Web Port (8554), Web Port Log (None), SD Card Format (Disable), Tracker Restart (Disable), and IPC Version (20260713-115412). A 'Save' button is at the bottom. The bottom screenshot shows the 'Video' page, which has a sidebar with 'System Info', 'System Settings', 'Video', and 'File Management'. The main content area is titled 'Stream' and contains fields for Encoding Mode (H.265), Flip/Mirror (No), and Bitrate (3000). 'Save' and 'Reset to Default' buttons are at the bottom.

• IP Address: Camera IP, which is the IP address of this product. The default is 192.168.144.119 and the port number is 2000. (Users can freely change the address) The address should be in the same network segment as the IP address on the computer. If it is not the same, the address needs to be set on the computer's Ethernet.

• Gateway: Modify the IP gateway to 192.168.144.11 by default.

• Subnet Mask: Default is 255.255.255.0.

• Web Port: The port number used to access the system settings page, which defaults to 8554.

• SD Card Format: After enabling, format the SD card, which is disabled by default.

- Tracker Restart: After enabling, restart the tracker, which defaults to disabled.
- Encoding Mode: H.264 and H.265 can be selected.
- Flip/Mirror: When enabled, the video flip mirror is turned off by default.
- Bitrate: Default is 3000, optional range is 1000~8000.
- After changing the device configuration, click save and the page will display that the changes were successful. After that, restart the device.

■ Remote download of photos/videos from web pages:

- ① Click on File Manager to open SD Card Files.
- ② Select the photos in the log file, and after downloading, you can view them.
- ③ Open the record folder: Select the video you want to download, and when the browser displays that the download is complete, you can view the recorded video in the save location.



Filename	Size	Modification Time	Actions
System Volume Information			
pic_0.jpg	94.35 KB	2026-07-14 10:00:00	Download
pic_1.jpg	100.43 KB	2026-07-14 10:01:00	Download
pic_2.jpg	118.06 KB	2026-07-14 10:01:52	Download
pic_3.jpg	125.07 KB	2026-07-14 10:01:54	Download
pic_4.jpg	126.41 KB	2026-07-14 10:01:54	Download
pic_5.jpg	115.13 KB	2026-07-14 10:01:56	Download
pic_6.jpg	122.90 KB	2026-07-14 10:01:56	Download
record		2026-07-14 10:01:56	



Filename	Size	Modification Time	Actions
Record0.mp4	20.00 MB	2026-07-14 10:01:56	Download
Record1.mp4	20.00 MB	2026-07-14 10:02:00	Download
Record2.mp4	20.00 MB	2026-07-14 10:02:02	Download
Record3.mp4	20.00 MB	2026-07-14 10:02:05	Download

Command Protocol

This agreement is a universal version. If you need more detailed agreement content, please contact the manufacturer.

■ Protocol format:

byte1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7
Sync byte	Address code	Instruction code1	Instruction code2	Data code1	Data code2	Check code

■ Protocol format:

·Serial port or network port can be used for command control, and the serial port version controller baud rate 115200bps; The network IP address (default) is 192.168.144.119, and the port number is 2000;

·All the values in the protocol are hexadecimal;

·The instruction sync byte is always 0xFF;

·"Address code" is the logical address of the controlled equipment, address range: 0x01-0xFF;

·"Instruction code" indicates different actions;

·"Data codes" 1 and 2 represent the parameters corresponding to the pod command;

·"Check code"= byte 2 + byte 3 + byte 4 + byte 5 + byte 6;

·The "Data receiving protocol" and "S.BUS channel configuration" are only valid on the serial port.

■ Control instruction:

·Motion stop (instruction code 1 is 0x00, instruction code 2 is 0x00)

Example: 0xFF,0x01,0x00,0x00,0x00,0x00,0x01 (Stop all commands in speed control mode)

·Pitch up (instruction code 1 is 0x00, instruction code 2 is 0x08, data code 2 is motion speed, speed range 0x00-0xFF)

Example: 0xFF,0x01,0x00,0x08,0x00,0xFF,0x08 (in upward movement speed 0xFF)

·Pitch down (instruction code 1 is 0x00, instruction code 2 is 0x10, data code 2 is motion speed, speed range 0x00-0xFF)

Example: 0xFF,0x01,0x00,0x10,0x00,0xFF,0x10 (in downward movement speed 0xFF)

·Yaw left (instruction code 1 is 0x00, instruction code 2 is 0x04, data code 1 is motion speed, speed

range 0x00-0xFF)

Example: 0xFF,0x01,0x00,0x04,0xFF,0x00,0x04 (to speed 0xFF movement to the left)

·Yaw right (instruction code 1 is 0x00, instruction code 2 is 0x02, data code 1 is motion speed, speed range 0x00-0xFF)

Example: 0xFF,0x01,0x00,0x02,0xFF,0x00,0x02 (to speed 0xFF movement to the right)

·PTZ left and up (instruction code 1 is 0x00, instruction code 2 is 0x0C, data code 1 is left motion speed, data code 2 is up motion speed, speed range 0x00-0xFF)

Example: 0xFF,0x01,0x00,0x0C,0xFF,0xFF,0x0B (in speed 0xFF movement on the left)

·PTZ left and down (instruction code 1 is 0x00, instruction code 2 is 0x14, data code 1 is left motion speed, data code 2 is down motion speed, speed range 0x00-0xFF)

Example: 0xFF,0x01,0x00,0x14,0xFF,0xFF,0x13 (in speed 0xFF movement under the left)

·PTZ right and up (instruction code 1 is 0x00, instruction code 2 is 0x0A, data code 1 is the right movement speed, data code 2 is the up movement speed, speed range 0x00-0xFF)

Example: 0xFF,0x01,0x00,0x0A,0xFF,0xFF,0x09 (to upper right movement with speed 0xFF)

·PTZ right and down (instruction code 1 is 0x00, instruction code 2 is 0x12, data code 1 is the right movement speed, data code 2 is the down movement speed, speed range 0x00-0xFF)

Example: 0xFF,0x01,0x00,0x12,0xFF,0xFF,0x11 (to lower right movement with speed 0xFF)

·Visible light zoom- (instruction code 1 is 0x00, instruction code 2 is 0x20, data code 1 is zoom speed, speed range 0x00-0x08)

Example: 0xFF,0x01,0x00,0x20,0x04,0x00,0x25 (Visible light zooms to the near end at speed 0x04)

·Visible light zoom+ (instruction code 1 is 0x00, instruction code 2 is 0x40, data code 1 is zoom speed, speed range 0x00-0x08)

Example: 0xFF,0x01,0x00,0x40,0x04,0x00,0x45 (Visible light is zoomed out to the far end at speed 0x04)

·Visible light zoom stop (instruction code 1 is 0x00, instruction code 2 is 0x60, data code 1 is 0x00)

Example: 0xFF,0x01,0x00,0x60,0x00,0x00,0x61 (Visible light zoom stop)

·Point to move (screen XY coordinates) (instruction code 1 is 0x10, instruction code 2 is 0x00, data code 1 is X value (↔), data code 2 is Y value (↑), speed range 0x00-0xFF, INYYO 46W does not support this function)

Example: 0xFF,0x01,0x10,0x00,0x40,0x40,0x91 (Point to move to the top-left 1/4 of the screen)

·Pitch angle control (instruction code 1 is 0x10, instruction code 2 is 0x01, (data code 1*256+ data code 2)÷50 are angle values (signed int16))

Example: 0xFF,0x01,0x10,0x01,0x01,0xF4,0x07 (Pitch rotated to 10 degrees)

·Yaw angle control (instruction code 1 is 0x10, instruction code 2 is 0x02, (data code 1*256+ data code 2)÷50 are angle values (signed int16))

Example 1: 0xFF,0x01,0x10,0x02,0x13,0x88,0xAE (Yaw rotation to 100 degrees)

Example 2: 0xFF,0x01,0x10,0x02,0xEE,0x6C,0x6D (Yaw rotation to -90 degrees)

·Point tracking (screen XY coordinates) (instruction code 1 is 0x11, instruction code 2 is 0x00, data code 1 is X value (↔), data code 2 is Y value (↑), speed range 0x00-0xFF)

Example 1: 0xFF,0x01,0x11,0x00,0x40,0x40,0x92 (Lock the top left quarter of the screen for tracking)

Example 2: 0xFF,0x01,0x11,0x00,0x7F,0x7F,0x10 (Lock the center of the screen for tracking)

·Stop tracking (instruction code 1 is 0x11, instruction code 2 is 0x01)

Example: 0xFF,0x01,0x11,0x01,0x00,0x00,0x13 (Stop target tracking)

·Open the target detection (instruction code 1 is 0x11, instruction code 2 is 0x02, Only the photoelectric pod with AI detection, identification and tracking function supports this function)

Example: 0xFF,0x01,0x11,0x02,0x00,0x00,0x14 (Open the target detection identification)

·Close the target detection (instruction code 1 is 0x11, instruction code 2 is 0x03, Only the photoelectric pod with AI detection, identification and tracking function supports this function)

Example: 0xFF,0x01,0x11,0x03,0x00,0x00,0x15 (Close the target detection identification)

·Open test aided tracking (instruction code 1 is 0x11, instruction code 2 is 0x04, the auxiliary detection function is to use the detection ability to prevent the loss of the target when the target tracking is blocked, and only the photoelectric pod with AI detection, recognition and tracking function supports this function)

Example: 0xFF,0x01,0x11,0x04,0x00,0x00,0x16 (Open test aided tracking)

·Close test aided tracking (instruction code 1 is 0x11, instruction code 2 is 0x05, only the photoelectric pod with AI detection, recognition and tracking function supports this function)

Example: 0xFF,0x01,0x11,0x05,0x00,0x00,0x17 (Close test aided tracking)

·Take a picture (instruction code 1 is 0x12, instruction code 2 is 0x00)

Example: 0xFF,0x01,0x12,0x00,0x00,0x00,0x13 (Take a picture)

·Start recording (instruction code 1 is 0x12, instruction code 2 is 0x01)

Example: 0xFF,0x01,0x12,0x01,0x00,0x00,0x14 (Start recording)

·Stop recording (instruction code 1 is 0x12, instruction code 2 is 0x02)

Example: 0xFF,0x01,0x12,0x02,0x00,0x00,0x15 (Stop recording)

·Enable follow (instruction code 1 is 0x13, instruction code 2 is 0x00)

Example: 0xFF,0x01,0x13,0x00,0x00,0x00,0x14 (Switch to Enable follow)

·Disable follow (instruction code 1 is 0x13, instruction code 2 is 0x01)

Example: 0xFF,0x01,0x13,0x01,0x00,0x00,0x15 (Switch to Disable follow)

·One-click down (instruction code 1 is 0x13, instruction code 2 is 0x02, used to collect ortho image, this function is disabled when PTZ is mounted)

Example: 0xFF,0x01,0x13,0x02,0x00,0x00,0x16 (PTZ pitch axis turned to -90°, maintain vertical looking posture)

·One-click reset (instruction code 1 is 0x13, instruction code 2 is 0x03)

Example: 0xFF,0x01,0x13,0x03,0x00,0x00,0x17 (Yaw axis and pitch axis return to the middle position)

·Picture-in-picture mode switching (instruction code 1 is 0x14, instruction code 2 is 0x00, data code 1 is picture mode,0x00: visible light embedded thermal imaging,0x01: thermal imaging embedded visible light,0x02: visible light,0x03: thermal imaging, only the photoelectric pod containing a variety of optical camera modules has this function)

Example: 0xFF,0x01,0x14,0x00,0x02,0x00,0x17 (Switch to visible light)

·Thermal imaging black heat, white heat, color switching (instruction code 1 is 0x15, instruction code 2 is 0x00, data code 1 is black heat, white heat, color switch, 0x00: white heat,0x01: black heat, 0x02: color, only the photoelectric pod containing the thermal imaging module has this function)

Example: 0xFF,0x01,0x15,0x00,0x01,0x00,0x17 (Thermal imaging mode switch to black heat)

·Single ranging/Triggered Location (instruction code 1 is 0x16, instruction code 2 is 0x00, Only optical Pods containing laser ranging modules have this function. (Laser ranging pods can automatically locate targets after entering the specified protocol and ranging at the same time.))

Example: 0xFF,0x01,0x16,0x00,0x00,0x00,0x17 (Distance once and target location)

·Turn on continuous ranging (instruction code 1 is 0x16, instruction code 2 is 0x01, Only the photonics pod containing the laser ranging module has this function)

Example: 0xFF,0x01,0x16,0x01,0x00,0x00,0x18 (Turn on continuous ranging)

·Turn off continuous ranging (instruction code 1 is 0x16, instruction code 2 is 0x02, Only the photonics pod containing the laser ranging module has this function)

Example: 0xFF,0x01,0x16,0x02,0x00,0x00,0x19 (Turn on continuous ranging)

·Thermal imaging electronic zoom (instruction code 1 is 0x17, instruction code 2 is 0x00, data code 1 is electronic zoom multiple (1-8 times), 0x00:1 times,0x01:2 times,0x02:3 times,0x03:4 times,

only the photoelectric pod containing the thermal imaging module has this function)

Example: 0xFF,0x01,0x17,0x00,0x01,0x00,0x19 (Thermal imaging zoom to 2X)

·Turn on electronic image stabilization (instruction code 1 is 0x18, instruction code 2 is 0x00, only the photoelectric pod with AI detection, identification and tracking function supports this function)

Example: 0xFF,0x01,0x18,0x00,0x00,0x00,0x19 (Turn on electronic image stabilization)

·Turn off electronic image stabilization (instruction code 1 is 0x18, instruction code 2 is 0x01, only the photoelectric pod with AI detection, identification and tracking function supports this function)

Example: 0xFF,0x01,0x18,0x01,0x00,0x00,0x1A (Turn off electronic image stabilization)

·Turn on OSD (instruction code 1 is 0x19, instruction code 2 is 0x00)

Example: 0xFF,0x01,0x19,0x00,0x00,0x00,0x1A (Open screen OSD information)

·Turn off OSD (instruction code 1 is 0x19, instruction code 2 is 0x01)

Example: 0xFF,0x01,0x19,0x01,0x00,0x00,0x1B (Close screen OSD information)

·Turn on visible light manual focus (instruction code 1 is 0x1D, instruction code 2 is 0x00)

Example: 0xFF,0x01,0x1D,0x00,0x00,0x00,0x1E (Turn on visible light manual focus)

·Turn off visible light manual focus (instruction code 1 is 0x1D, instruction code 2 is 0x01)

Example: 0xFF,0x01,0x1D,0x01,0x00,0x00,0x1F (Turn off visible light manual focus)

·Focus the near end manually (instruction code 1 is 0x1D, instruction code 2 is 0x02)

Example: 0xFF,0x01,0x1D,0x02,0x00,0x00,0x20 (Visible to the remote focusing)

·Focus the distal end manually (instruction code 1 is 0x1D, instruction code 2 is 0x03)

Example: 0xFF,0x01,0x1D,0x03,0x00,0x00,0x21 (Restore default video streaming address)

·Manual focus Stop(instruction code 1 is 0x1D, instruction code 2 is 0x04)

Example: 0xFF,0x01,0x1D,0x04,0x00,0x00,0x22

·Query S.BUS channel configuration (instruction code 1 is 0x1E, instruction code 2 is 0x00, the current S.BUS channel configuration will be returned after sending)

Example: 0xFF,0x01,0x1E,0x00,0x00,0x00,0x1F (Query S.BUS channel configuration)

·Query movement time (instruction code 1 is 0x1E, instruction code 2 is 0x01)

Example: 0xFF,0x01,0x1E,0x01,0x00,0x00,0x20

·Query version(instruction code 1 is 0x1E, instruction code 2 is 0x02.Return data format: EE, 06, 0B, Version type, pod model, date, time, minute, sum check. The date is 3 bytes, and the rest are 1 bytes.)

Example: 0xFF,0x01,0x1E,0x02,0x00,0x00,0x21

·Specifies the return frequency of pod status information (instruction code is 0x20 0x00, data code 1 is the return frequency, 0x01 corresponds to 1Hz, 0x02 corresponds to 2Hz (default), 0x03

corresponds to 3Hz, ... 0x09 corresponds to 9Hz, 0x0A corresponds to 10Hz, and the value ranges from 1 to 10Hz)

Example 1: 0xFF,0x01,0x20,0x00,0x02,0x00,0x23(The return frequency of pod status information is 2Hz)

Example 2: 0xFF,0x01,0x20,0x00,0x0A,0x00,0x2B(The return frequency of pod status information is 10Hz)

·Restore default video streaming address(instruction code 1 is 0x21, instruction code 2 is 0x00)

Example: 0xFF,0x01,0x21,0x00,0x00,0x00,0x22(Only have AI detection identification tracking function of photoelectric pod to support this feature)

·Query the pull address(instruction code 1 is 0x21, instruction code 2 is 0x01)

Example: 0xFF,0x01,0x21,0x01,0x00,0x00,0x23(Only have AI detection identification tracking function of photoelectric pod to support this feature)

·Turn on PTZ(instruction code 1 is 0x22, instruction code 2 is 0x00)

Example: 0xFF,0x01,0x22,0x00,0x00,0x00,0x23

·Turn off PTZ(instruction code 1 is 0x22, instruction code 2 is 0x01)

Example: 0xFF,0x01,0x22,0x01,0x00,0x00,0x24

·PTZ reboot(instruction code 1 is 0x22, instruction code 2 is 0x02)

Example: 0xFF,0x01,0x22,0x02,0x00,0x00,0x25

·Movement reboot(instruction code 1 is 0x22, instruction code 2 is 0x03)

Example: 0xFF,0x01,0x22,0x03,0x00,0x00,0x26

·Set data reply frequency (instruction code 1 is 0x20, instruction code 2 is 0x00, data code 1 is frequency, support 1-10Hz)

Example: 0xFF,0x01,0x20,0x00,0x0A,0x00,0x2B (Set data reply frequency to 10Hz)

·The initial movement speed of the in PTZ speed control mode is 0-45 °/s;

·The initial movement speed of the One-click reset/One-click down, angle control, point to move function is about 300 °/s. When approaching the specified angle, the speed will gradually decrease to complete the action;

·The angle control Instruction cannot input the angle value exceeding the working range of the PTZ;

·The default data reply frequency is 2Hz;

·After entering the specified receiving protocol, the photoelectric pod will automatically conduct target positioning.

ZINGTO

ZINGTO

■ Response data:

No.	Function	Byte	Note
1	Header	0xEE	
2	Message ID	0x01	
3	Frame length	0x1D	The length of all messages is 29 bytes
4	Laser ranging distance (decimeter)	Low eight	Product data without laser ranging function is 0
5		High eight	
6	PTZ roll angle (@0.1°)	Low eight	Tilting left is negative, tilting right is positive
7		High eight	
8	PTZ pitch angle (@0.1°)	Low eight	Head down is negative, head up is positive
9		High eight	
10	PTZ yaw angle (@0.1°)	Low eight	Turn right from 0 to 180
11		High eight	Turn left from 0 to -180
12	Visible light zoom multiple (integer)		
13	Track status		0x00: Not tracked 0x01: Tracking
14	Target latitude*10000000	Low byte	Example: The actual latitude is 38.1234567, and the four byte data is 381234567
15			
16			
17		High byte	
18	longitude*10000000	Low byte	Example: The actual longitude is 114.1234567, and the data of these four bytes is 1141234567
19			
20			
21		High byte	
22	Target height (decimeter)	Low eight	
23		High eight	
24	Visible light zoom multiple (0.1x)	Low eight	
25		High eight	
26	Reserve		

27	Reserve		
28	PTZ working mode		0x00: Enable follow, 0x01: Disable follow, 0x02: One-click down
29	Sum check		1-28 bytes sum, take the lower eight bits

·Example:0xEE,0x01,0x1D,0xB8,0x0B,0x32,0x00,0x3E,0xFE,0xE8,0x03,0x05,0x01,0x87,0x2D,0xB9,0x16,0x87,0xDB,0x05,0x44,0x7B,0x00,0x00,0x00,0x00,0x00,0x01,0xD8

(Laser ranging is 300m, roll angle is 5°, pitch angle is -45°, yaw angle is 100°, visible light zoom is 5x, tracking is underway, target latitude is 38.1234567, target longitude is 114.1234567, target altitude is 12.3m, and PTZ working mode is disable follow.)

■ Data receiving protocol:

No.	Function	Byte	Note
1	Header	0xEE	
2	Message ID	0x81	
3	Frame length	0x22	The length of all messages is 34 bytes
4	Aircraft (mechanical platforms) roll angle (@0.1°)	Low eight	Tilting left is negative, tilting right is positive
5		High eight	
6	Aircraft (mechanical platforms) pitch angle (@0.1°)	Low eight	Head down is negative, head up is positive
7		High eight	
8	Aircraft (mechanical platforms) yaw angle (@0.1°)	Low eight	Turn right from 0 to 180 Turn left from 0 to -180
9		High eight	
10	Aircraft (mechanical platforms) latitude*10000000	Low byte	Example: The actual latitude is 38.1234567, and the four byte data is 381234567
11			
12			
13		High byte	

14	Aircraft (mechanical platforms) longitude*10000000	Low byte	Example: The actual longitude is 114.1234567, and the data of these four bytes is 1141234567
15			
16			
17		High byte	
18	Aircraft (mechanical platforms) altitude (decimeter)	Low eight	
19		High eight	
20	Aircraft (mechanical platforms) relative height (decimeter)	Low eight	
21		High eight	
22	GPS time (Beijing time)	Year	Example: This byte will be 21 in 2021
23		Month	
24		Day	
25		Hour	24-hour
26		Minute	
27		Second	
28	Aircraft (mechanical platforms) eastward speed(cm/s)	Low eight	East direction is positive
29		High eight	
30	Aircraft (mechanical platforms) northbound speed(cm/s)	Low eight	North direction is positive
31		High eight	
32	Aircraft (mechanical platforms) ascent speed(cm/s)	Low eight	Sky direction is positive
33		High eight	
34	Sum check		1-33 bytes sum, take the lower eight bits

·Example:

0xEE,0x81,0x22,0x32,0x00,0x3E,0xFE,0xE8,0x03,0x87,0x2D,0xB9,0x16,0x87,0xDB,0x05,0x44,0
xD0,0x07,0x7B,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x6A

(The aircraft (mechanical platforms) roll angle is 5°, pitch angle is -45°, yaw angle is 100°, latitude is 38.1234567, longitude is 114.1234567, altitude is 200, relative height is 12.3)

■ Current S.BUS channel configuration reply:

No.	Function	Byte	Note
1	Header	0xEE	
2	Message ID	0x04	
3	Frame length	0x1C	The length of all messages is 28 bytes
4	Pitch		The corresponding byte for each function represents the corresponding channel number, such as the pitch byte is 0x01, and the yaw byte is 0x03, which represent channel 1 controlling pitch and channel 3 controlling yaw. The channel number range is 1-16. If it exceeds the range, it cannot be set successfully, and "0" represents not activating this function.
5	Yaw		
6	Visible light zoom		
7	Visible light manual focus		
8	PTZ Mode switch, One-click down		
9	One-click reset		
10	Photography		
11	Target detection and tracking		
12	PIP, black heat, white heat, color		
13	Thermography electronic zoom		
14	Laser ranging(none)		
15	Laser night vision (none)		
16	OSD-switch		
17	Reserve		
18	Reserve		
19	Reserve		
20	Reserve		

21	Reserve		
22	Reserve		
23	Reserve		
24	Reserve		
25	Reserve		
26	Reserve		
27	Reserve		
28	Sum check		1-27 byte sum, take the lower eight bits

- Example:

0xEE,0x04,0x1C,0x01,0x03,0x02,0x04,0x05,0x06,0x00,0x00,0x00,0x00,0x00,0x00,
0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x00,0x23

(Pitch is CH1, yaw is CH3, zoom is CH2, manual focus is CH4, mode switch is CH5, one click reset is CH6, and other functions are not mapped)

The instructions for setting the S.BUS channel can be found in "S.BUS Channel Settings" in this article.

After Sales Service

This chapter mainly introduces the after-sales service and the relevant statements of the scope of non-after-sales protection.

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After Sales Service

After Sales Service

- **General Service Terms:** This after-sales service applies to all products sold by Xiangtuo Technology's official and authorized distributors, and is only available to end users. Commercial and resale products do not enjoy this warranty service. Users are required to use the product in accordance with the product manual specifications and follow the after-sales process.
- **Product Warranty Period:** The warranty period for regular gimbal products is 12 months of free warranty from the day of receipt, with lifetime paid after-sales support provided.
- **Acceptance conditions:** During the warranty period, if there is a non-human performance failure, the product must not be disassembled without authorization, modified by official sources, or used in violation of regulations, and valid purchase vouchers such as invoices, receipts, and order numbers can be provided to enjoy free warranty services.
- **Application for after-sales service:** During the warranty period, if the product cannot achieve the guaranteed functions, please contact the official after-sales technology or authorized dealer of Xiangtuo Technology and explain in detail the problems with the product to obtain corresponding after-sales service; If your problem cannot be solved through phone or remote video communication, you need to send the product back to Xiangtuo Technology Company for further testing.
- **Replacing products and components:** If the warranty service you apply for involves replacing products or components, the replaced products or components will become the property of Xiangtuo Technology, and the replaced products or components will become your property. Only unmodified Xiangtuo Technology products and components can be replaced; The replacement products or components provided by after-sales service may not be brand new, but they are definitely in good working condition and at least equivalent in performance to the replaced parts. The replaced product

or component is entitled to the same warranty service during the remaining warranty period of the original product.

- Shipping and logistics costs: The cost of sending the package back to the company is borne by the customer, and payment on delivery is not accepted.

The company shall bear the cost of returning the item due to quality issues or other company responsibilities during the warranty period.

During the warranty period, if the customer causes personal damage or exceeds the warranty period, the customer shall bear the cost of returning the item, which can be paid on delivery via SF Express.

- Please do not disassemble or repair on your own, otherwise you will not be able to enjoy product warranty services.

- The final interpretation right belongs to our company. For detailed after-sales service policies and paid repair services, please contact the after-sales technical team.

Scope Of Non-After-Sales Guarantee

- Non product quality issues caused by human factors, such as device wear, breakage, burning, and other accidents.
 - Damage caused by unauthorized modification, disassembly, and shell opening without following the official instructions.
 - Damage caused by incorrect installation, use, and operation not following the instructions in the product manual.
 - Damage caused by self repair or installation of components.
 - Damage caused by unofficial instructions for circuit modification, or improper matching and use of battery packs and chargers.
 - Damage caused by handling in extremely harsh environments, such as strong winds, rainy days, sandstorms, etc.
 - Damage caused in complex electromagnetic environments or in the presence of strong interference sources, such as mining areas, transmission towers, high-voltage lines, substations, etc.
 - Damage caused by interference with other wireless devices, such as transmitters, image transmission signals, WiFi signal interference, etc.
 - Damage caused by forced operation despite aging or damage to components.
 - Damage caused by reliability and compatibility issues when used in conjunction with third-party components certified by non developers and manufacturers.
- Damage caused by insufficient power supply, high voltage, or use of batteries with quality issues resulting in insufficient discharge.
- The product runs continuously or incorrectly.
 - Data loss or damage caused by the product itself.

- Any malfunction or damage caused by third-party products (including all other products provided by distributors/manufacturers or integrated into this product as per your request).
- Damage caused by modifying or tearing off identification labels and tear resistant stickers.
- Unable to provide valid purchase vouchers or engaged in forgery or alteration.
- Due to force majeure caused by local policies, natural disasters, or other special reasons, after-sales service cannot be provided.

Thank you for your use

This product is approved to leave factory as it meets the manufacturer's standard after inspection.

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