

360StarLight Panorama Production and VR Live  
Streaming System - Controller

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## 1. Product Function Overview

TECHE Center is the accompanying software for the Teche 360StarLight panoramic camera. It enables users to control the camera for video, photo, or time-lapse photography via wired or wireless networks. Users can adjust technical parameters of the camera and manage the media captured by the camera for reviewing. This helps users efficiently capture high-definition VR panoramic photos or videos using the Teche 360StarLight panoramic camera.

**2. Operating Environment** (Supports operation without an NVIDIA graphics card, but does not support the review function.)

Hardware	System Requirements
CPU	Intel Core i7 or higher-grade CPU
RAM	8G
Graphics card	GTX 1060 or higher
Graphics memory	6G
Operating system	Windows 10 64-bit operating system or higher

## 3. User Interface Introduction

I)Main Page Structure: After connecting to the camera, the system will navigate to the controller's main page, which is divided into the following sections:

Menu Bar: Used to select the system language environment, set camera IP address, and display help information, etc.

Camera Information Area: Displays basic information about the currently connected camera.

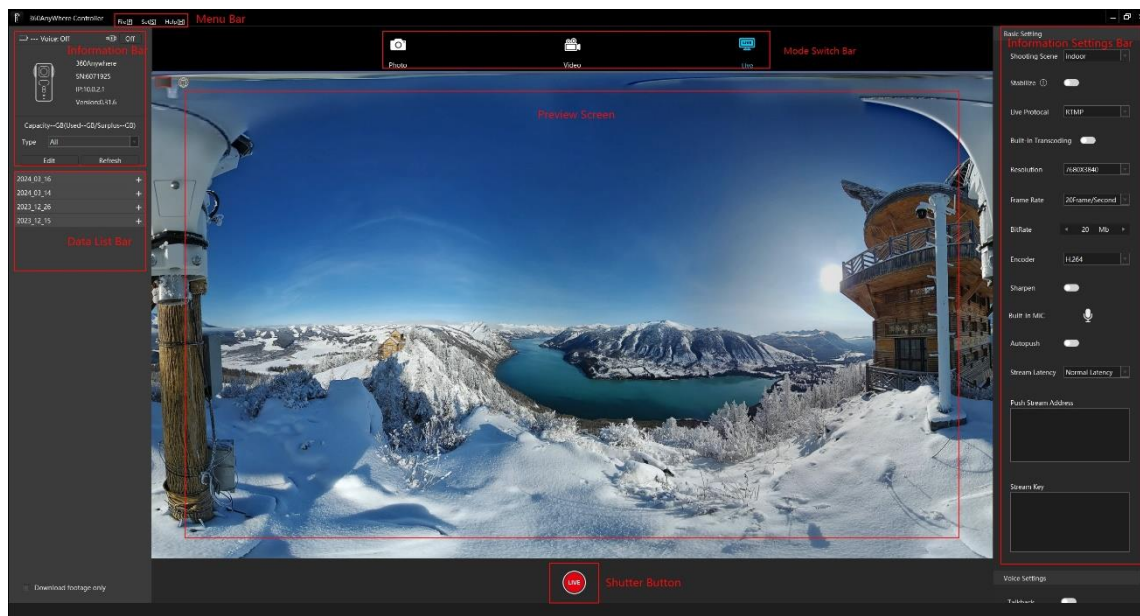
Media Management Area: Selects review materials, downloads, or deletes materials

Mode Control Area: Switches between camera modes such as photo, video, etc

Preview and Review Area: Allows real-time preview of the current shooting environment and the effects of parameter adjustments. It can also display the composite effect of previously captured materials

Shooting Control: Controls the start and stop of shooting

Parameter Settings: Adjusts parameters such as camera shooting content resolution, exposure compensation, etc



#### m) List of Functions

Menu Bar	Settings	Language	Chiness, English
		Network	Display, Indicator light switch,IP settings , USB storage mode, Logo overlay
	Help	About, Firmware update	
Connected camera information	Device type		
	Serial number		
	IP address		
	Storage usage		
	Camera battery		
	Disconnect		
Media management	Filter by type		
	Media editing		
	Media list		
Mode control	Photo		

	Video		
	Streaming		
Preview and review	Preview mode	Panorama mode	
		Tile mode	
	Lens numbering display	Display lens numbering	
		Hide lens numbering	
Shooting control	Start shooting		
	Stop shooting		
Parameter settings	Photo parameter settings	Mode	Single shot
			Time-lapse photography
			DNG10
		Shooting scene	Indoor, Indoor inversion, Outdoor, Outdoor inversion
		Image Format	Jpg
			Dng
		Resolution	4k, 6k, 8K
		In-camera stitching	On/Off
		Time-lapse photography interval	1fps, 3fps, 5fps, Customized
			Customized Settings: 1-20 minutes per shot
	Video Parameter Settings	Shooting scene	Indoor, Indoor inversion, Outdoor, Outdoor inversion

		Resolution and Frame Rate	7680x3840@30fps, 5760x2880@30fps, 3840x1920@30fps, 3840x1920@60fps
		Bit Rate	1-100M
		Volume	On/Off
		Split Time	10, 20, 30, 40, 50, 60 min, No Splitting
		In-camera stitching	On/Off
		Encoding Format	H265, H264
		Color Depth	8bit, 10bit
	Live Streaming Parameter Settings	Shooting scene	Indoor, Indoor inversion, Outdoor, Outdoor inversion
		Streaming Protocol	RTMP,RTSP,RTSP SERVER
		In-camera Transcoding	On/Off
		Streaming Mode	In-camera stitching and streaming
		Resolution and Frame Rate	7680x3840@30fps, 5760x2880@30fps, 3840x1920@30fps, 3840x1920@60fps
		Bit rate	1-100M
		Volume	On/Off
		Auto Startup	On/Off
		Streaming URL	User Input
		Streaming Key	User Input(RTMP Only)
		Substream	Resolution and Bitrate

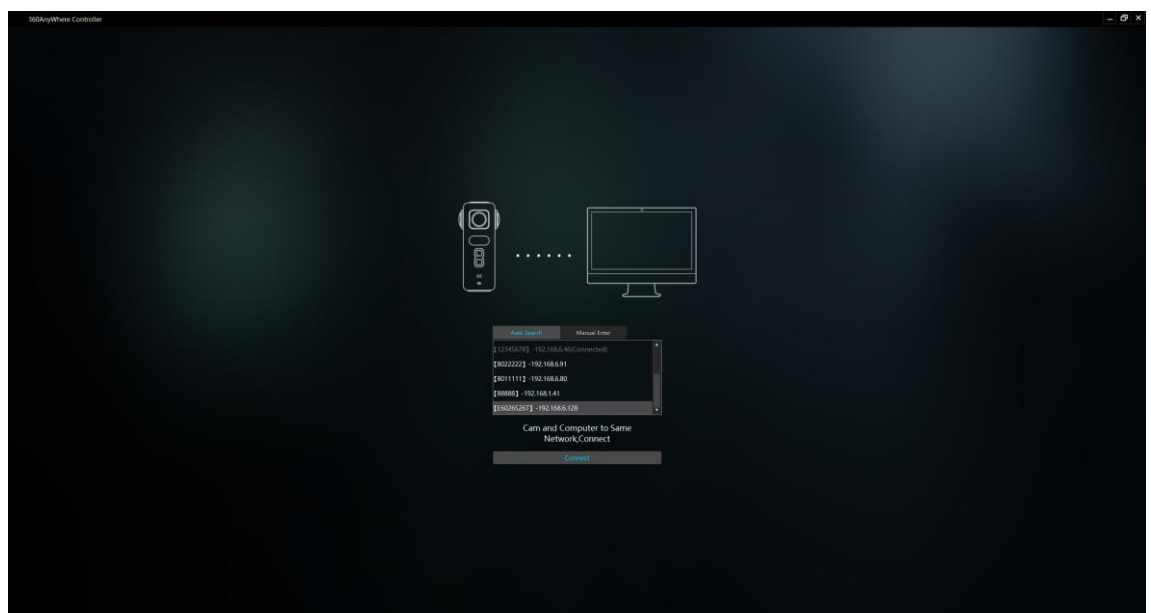
		Streaming URL	User Input
		Streaming Key	User Input(RTMP Only)
		Voice Intercom	Voice mode: Low Latency/ Audio-Video Synchronized
			Authentication Information, Upload Method, AppID
			Customer key, secret, License key

	General Parameter Settings	Exposure Settings	EV :-5 ~+5  ISO  Shutter Speed
		White Balance	Automatic, Incandescent Light, Sunlight, Fluorescent lamp, Cloudy, Manuel

#### 4. User Manual

##### n) Device connect:

i. Run teche center program and connect the 360StarLight panoramic camera and the computer running the program to the same network. At this point, the controller will display the detectable devices.

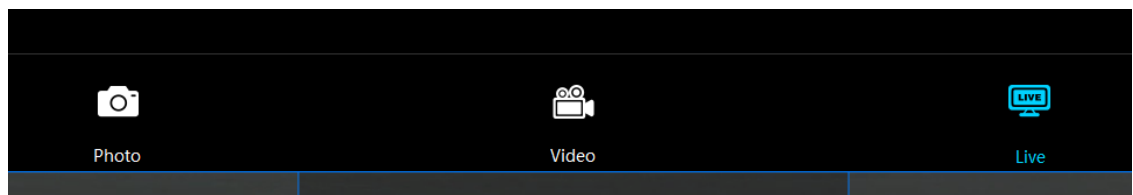




ii. Select the device you want to connect to, click the [Connect] button. After the system successfully connects to the camera, it will enter the main page.

o) Shooting mode selection: The 360StarLight panoramic camera supports three types of shooting: photo shooting, video shooting, and live streaming.

In the photo shooting mode, you can take single shots or continuous shots automatically. In the photo mode, select single shot or continuous shot in the parameter settings. Users can adjust according to their shooting needs.



i. Photo mode: In this mode, you can use the camera to take photos. After selecting this mode, the photo icon turns blue, and the setting area for photo settings is activated. You can take single shots or continuous shots automatically.

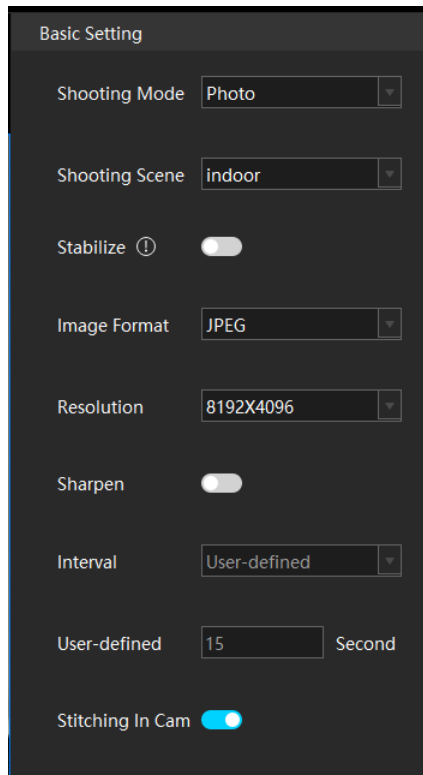
ii. Video mode: In this mode, you can use the camera for high-definition video recording. After selecting this mode, the video icon turns blue, and the setting area for video settings is activated.

iii. Live streaming mode: In this mode, you can use the camera for high-definition video live streaming. After selecting this mode, the live streaming icon turns blue, and the setting area for live streaming settings is activated.

**p) Basic Settings:**

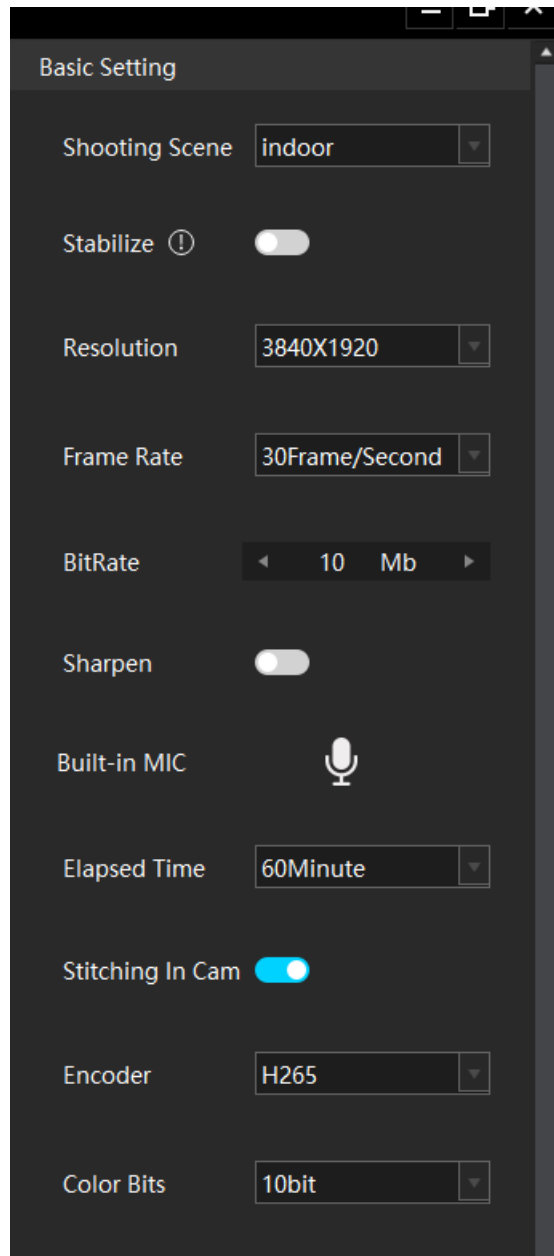
Users can configure the parameters of photos, videos, and live streaming according to actual situations. Some setting effects will be reflected in real-time on the preview screen.

i. Photo parameter settings:



1. Shooting modes: There are three modes available: Normal mode, Automatic burst mode, DNG10 mode. In Normal mode, users can manually select the shooting timing as needed. In Automatic burst mode, the camera will automatically take photos periodically according to the frequency selected by the user. In DNG10 mode, 10 DNG images will be captured for each lens.
2. Shooting Scene: Set real-time preview stitching effects based on the shooting scene selected by the user.
3. Image Format: JPG and DNG
4. Resolution: External stitching only supports 8k, while internal stitching allows selection of 4k, 6k, 8k.
5. Shooting interval: When the mode is set to automatic shooting, this setting will be activated. In Automatic burst mode, options include 1/5s, 1/3s, 1s, custom time interval setting, up to a maximum of 1200s
6. Internal stitching: Whether to enable. When internal stitching is enabled, after the camera takes a shot, a panoramic image will be automatically generated inside the camera, eliminating the need for post-processing with other software.
7. Sharpness enhancement: When enabled, the captured images will have higher sharpness.

ii. Video parameter settings:



1. **Shooting Scene:** Set real-time preview stitching effects based on the shooting scene selected by the user.
2. **Resolution and frame rate:** External stitching offers 8K 30FPS, internal stitching offers 7680x3840@30fps, 5760x2880@30fps, 3840x1920@30fps, 3840x1920@60fps
3. **Bitrate:** External stitching: 100Mbps, Internal stitching: selectable from 1 to 100Mbps.
4. **Volume:** Can set whether to mute.
5. **Segmented time:** Sets the length of individual video files. Currently available options include 10 minutes, 20 minutes, 30 minutes, 60 minutes, and non-segmented. Users can choose according to their needs.

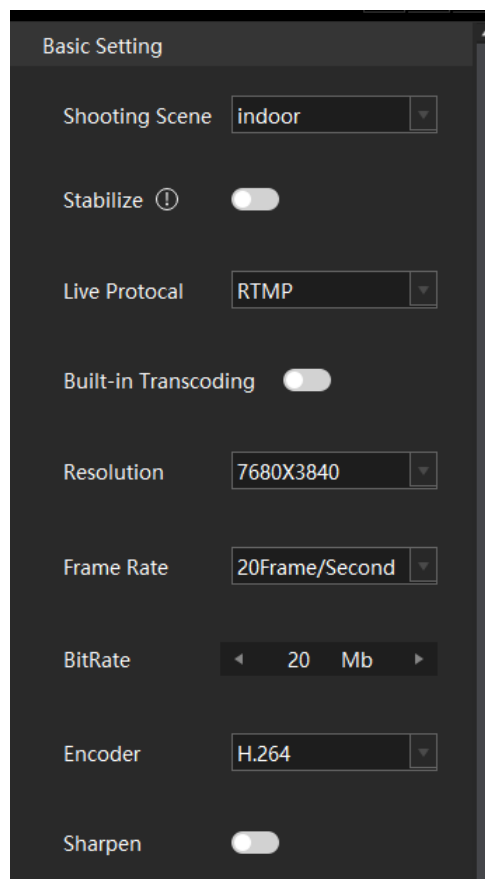
6. Internal stitching: Whether to enable. When internal stitching is enabled, after the camera takes a shot, a panoramic video will be automatically generated inside the camera, eliminating the need for post-processing with other software.

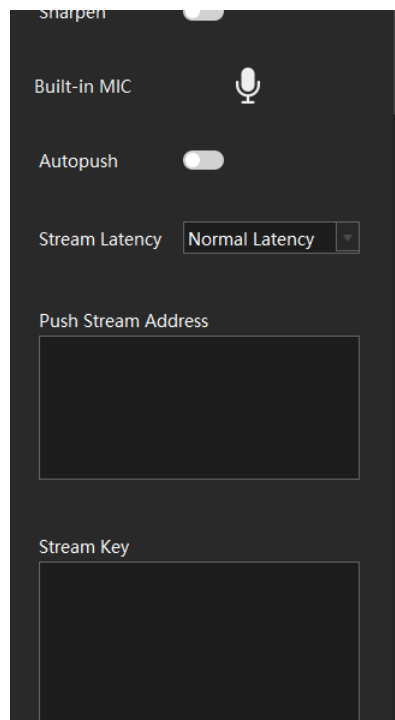
7. Video format: External stitching records videos in H.265 encoding, while internal stitching allows selection of H.264 or H.265.

8. Color Depth: 8bit 10bit

9. Sharpness enhancement: When enabled, the captured videos will have higher sharpness.

iii. Live streaming parameter settings:



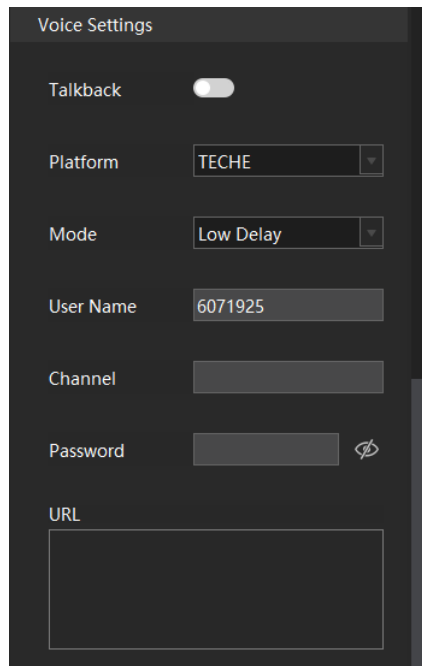


1. **Shooting Scene:** Set real-time preview stitching effects based on the shooting scene selected by the user.
2. **Live streaming protocol:** RTMP, RTSP, RTMP SERVER, SRT, and GB28181.
3. **Internal transcoding:** When enabled, it can be divided into main stream and sub-stream, achieving dual-stream live streaming.
4. **Streaming Mode:** In-camera stitching and streaming
5. **Resolution:** 8k (20,30FPS), 6K (25FPS), 5.5K(30FPS), 4K(30,60FPS)
6. **Bitrate:** Modify the output bitrate of the live video, supports 0-100Mbps, choose according to the actual network bandwidth.
7. **Volume:** Can set whether to mute.
8. **Autopush:** After enabling this option, if the device is powered off and restarted while in live broadcasting mode, it will resume broadcasting automatically.
9. **RTMP streaming URL:** Set the RTMP server address. The controller will push the video stream from the camera to the configured server, and viewers can watch it through the playback address provided by the live streaming platform.
10. **Streaming key:** Customers should fill in the corresponding stream key according to their own server streaming address.
11. **RTSP:** When the live streaming protocol is set to RTSP, three playback addresses will be automatically obtained: the camera's fixed IP playback address, the camera's automatically obtained IP playback address, and the camera's WiFi IP playback address. Depending on the corresponding obtained address, you can enter the streaming address in the player to watch the live broadcast.

12. RTMP SERVER: Obtain multiple playback addresses. Depending on the corresponding obtained address, you can enter the pull address in the player to watch the live broadcast. In RTMP SERVER mode, the camera provides built-in RTMP service for use within the local area network, suitable for a small number of playback terminals.

13. Sharpness enhancement: When enabled, the streaming will have higher sharpness.

iv. Voice intercom setting: Currently, the intercom function is only available for the 360StarLight camera.



The image shows a 'Voice Settings' configuration window. It contains several settings: 'Talkback' is a toggle switch currently turned off; 'Platform' is a dropdown menu set to 'TECHE'; 'Mode' is a dropdown menu set to 'Low Delay'; 'User Name' is a text field containing '6071925'; 'Channel' is an empty text field; 'Password' is an empty text field with a copy icon to its right; and 'URL' is a large empty text area at the bottom.

Voice Settings	
Talkback	<input type="checkbox"/>
Platform	TECHE
Mode	Low Delay
User Name	6071925
Channel	
Password	
URL	

:

Connect an external microphone to the bottom of the camera via the Type-C port to enable voice intercom mode. In the upper left corner of the status bar, the voice intercom is indicated as enabled, indicating that the voice intercom mode is activated. When all voice intercom settings take effect, the voice status in the upper left corner shows 'In call', otherwise it shows 'Connection failed'.

Voice mode: Low latency, audio-video synchronization; Under low latency mode, the RTMP live stream only contains video without audio, and the audio is handled by Agora services. In this mode, mobile devices can receive audio from the camera; Under audio-video synchronization mode, both video and audio from the camera are included in the RTMP live stream; In both modes, the camera should be able to receive audio from the mobile device, but the mobile device can only receive audio from the camera under low latency mode.

Voice channel: The input voice channel should be consistent with the channel set on the mobile device app (e.g., if the channel input on the PC controller side is 123, the channel set on the mobile playback app also needs to be 123).

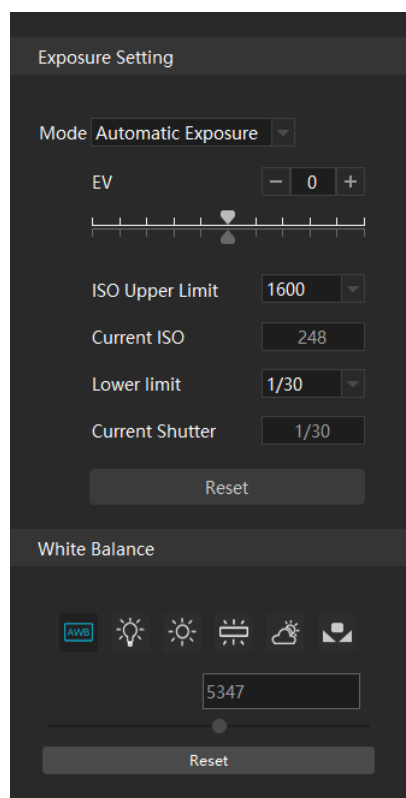
Authorization information: Not uploaded, Uploaded (When the voice intercom is used for the first time, the camera has not uploaded the intercom certificate.

When used for the second time, the camera has generated the intercom

certificate, and the authorization information becomes uploaded).

Upload method: Manual entry, File entry. You can manually enter or upload files to the camera

## v. Exposure Settings



### Exposure Parameter Settings:

1. 1 EV value adjustment: Adjusts the brightness of the image in real-time by changing the EV value from -5 to +5.
2. ISO setting: Divided into two settings, below and locked. ISO can be set from a minimum of 100 to a maximum of 6400.
3. Shutter speed: Divided into two settings, below and locked. The fastest shutter speed is 1/8000, and the slowest is 1/30.

### White Balance Settings:

White balance settings include automatic, incandescent, daylight, fluorescent, cloudy, and manual adjustment.

Shooting preview: This area will display the real-time stitching effect of the current camera's various lens shots. Any parameter modifications made by the user will be reflected in this area in real-time. This facilitates adjustments to the camera's position, angle, and parameters, providing a "what you see is what you get" experience.

vi. You can view the effect in panorama mode or 2:1 tile mode. The preview area can be displayed in full screen.







q) Start/Stop shooting: Once the framing position is confirmed and the parameters are adjusted, you can start shooting.

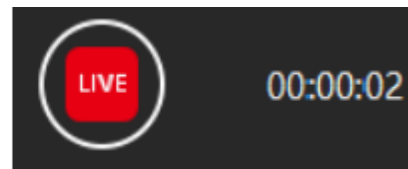
i. Click the start shooting button, and the camera will start shooting according to the user's design. When in continuous shooting, video shooting, and live streaming modes, the shooting button will display a specific color. Idle state is white, continuous shooting mode is blue, and video and live streaming modes are red.



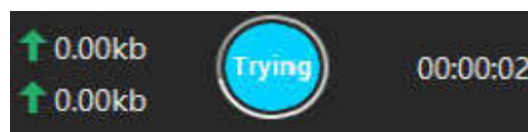
Idle



shooting Idle in streaming mode



Streaming



Trying to connect streaming server (On the left is the real-time upstream traffic, and on the right is the live broadcast time.)

ii. For a camera in continuous operation, click the shooting button again to stop shooting. After shooting is completed, the newly captured materials will be added to the material tree on the left side of the system.

r)Material review: Users can browse and view the material files saved in the camera through the controller to ensure that the shooting content meets their requirements.

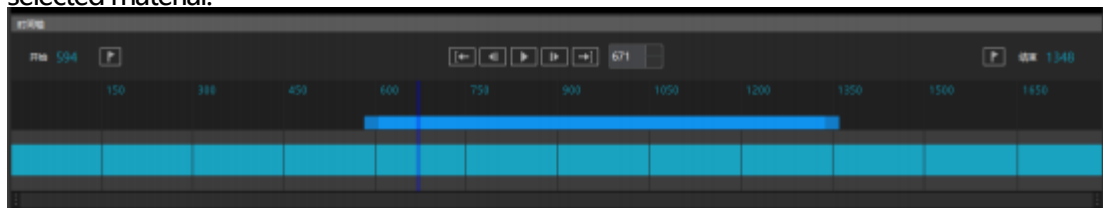
i. Photo review: Click on the directory name of the photos in the material list on the left side. The preview area of the system will switch to the review mode, displaying the stitching effect of the selected material. Reviewing can also be done in tile mode or panorama mode, supporting full-screen display of lens identifiers, with usage consistent with previewing.

ii. Video and burst shooting material review: After clicking on the video or burst shooting material, a timeline will be displayed at the bottom of the review area, allowing you to select the browsing range of the material.

1. Click on a specific position on the timeline, then click the "flag" button on the left to set the selected position as the starting point.

2. Similarly, click the "flag" button on the right to set the selected position as the endpoint.

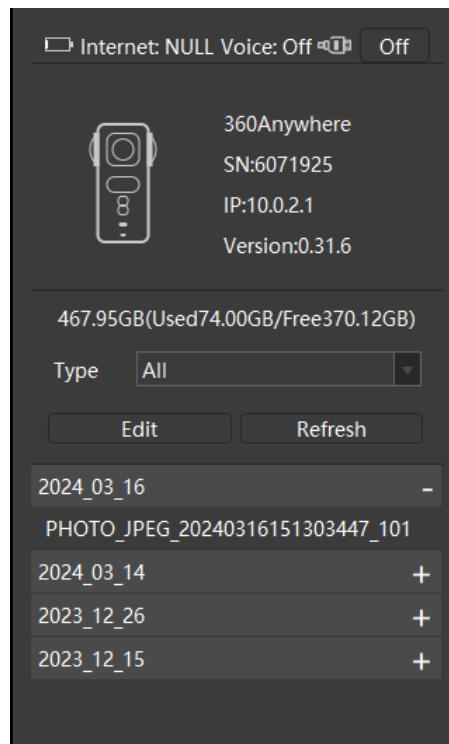
3. At this point, the displayed area is the automatic playback range of the selected material.



4. At this point, you can use the "Play" button to automatically display the stitching effect of the material frame by frame in the review area. You can also manually enter the frame number to directly jump to the desired preview position.

iii. Exiting review mode: While in review mode, click the "Back" button to exit review mode and switch to real-time preview mode.

s)Material management: After shooting is completed, the materials will be displayed in the list on the left side of the page. Photo materials are labeled with "Photo" at the beginning, followed by the image format and shooting time, as the material name. (001 is for external shooting, 101 is for internal shooting, 00A is for DNG10). Similarly, burst shooting and video materials are labeled with "Auto" and "Video" respectively. Through the editing function, you can download the materials to the local computer or delete the materials from the camera storage device.



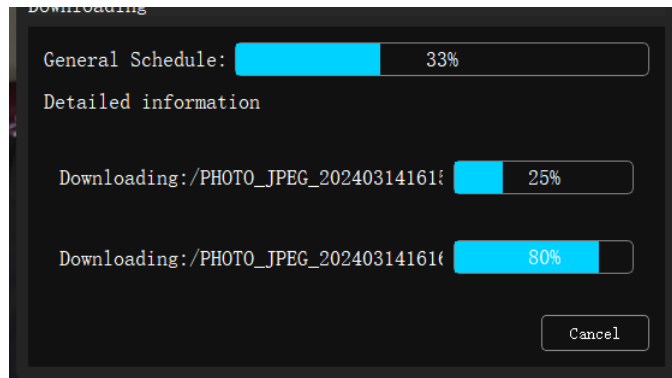
Left-side camera information overview:

Camera battery level,Network status,Camera name,Serial  
number,Current IP address,Firmware version,Camera capacity.

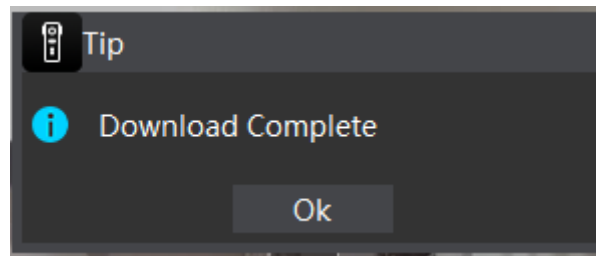
Download:

1. Click the "Edit" button, check the materials you want to download, then click the "Download" button. After selecting the output path, the download will begin.

2. The system will display the progress of material downloads. The progress bar at the top shows the overall download progress, indicating how many sets have been downloaded. The progress bar below represents the sub-progress, indicating how much of the currently downloading set of materials has been completed.



4. After the download is completed, the system will provide a corresponding prompt.



ii. Delete:

1. Click the "Edit" button, check the materials you want to delete, then click the "Delete" button. The system will delete the selected materials.

iii. Return: After entering the editing state, click the "Return" button to exit the editing state.

- iv. Click on the settings option in the top left corner to switch languages. Currently, it supports switching between Chinese and English (Note: After switching, you need to close and reopen the software for the changes to take effect).
- v.

Click on the settings option in the top left corner to set a fixed IP address for the camera.

Set Camera

Set IP

Way

DHCP

IP

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Mask

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Gateway

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DNS

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Service Port

8080

Display Screen

Indicator Light

USB Storage

LOGO

Reset

Apply

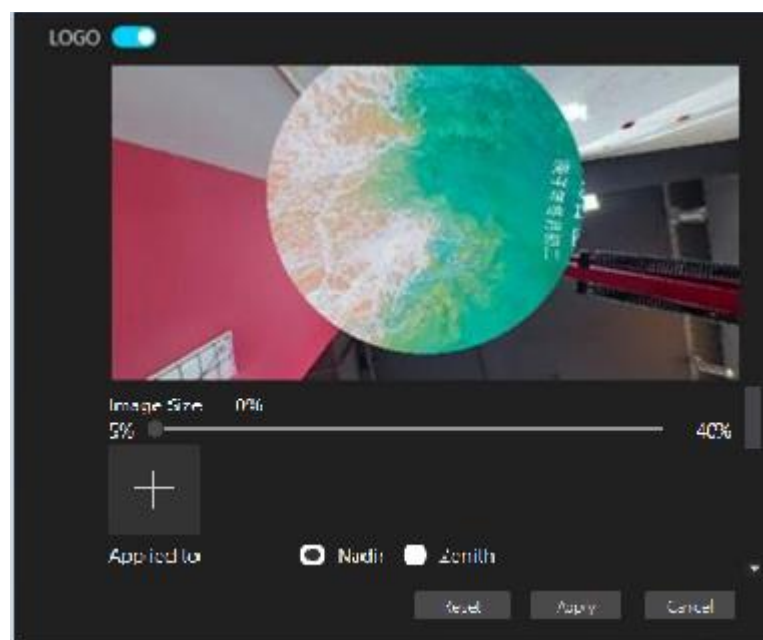
Cancel

vi. To activate the LED display screen and indicator light, you can perform the following operations:

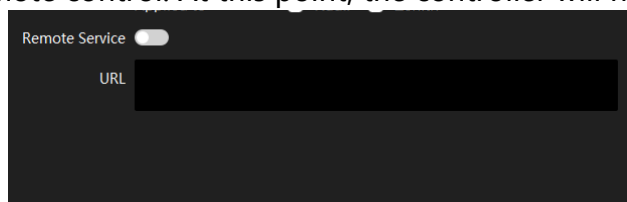
- LED Display Screen: Turn on the LED display screen.
- Indicator Light: Activate the indicator light.

vii. To activate USB storage settings, connect a USB cable to the bottom of the camera. You can then download data from the camera via the USB port.

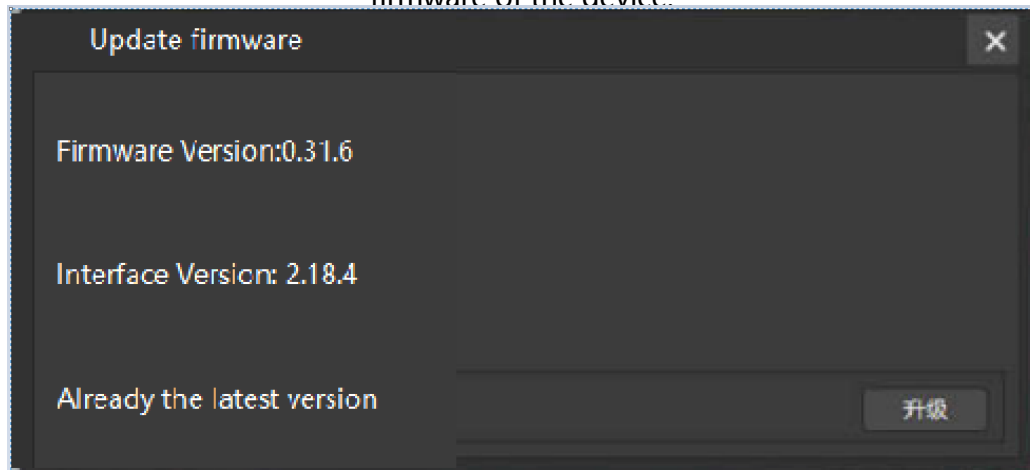
viii. To activate the logo feature, click on the plus icon below. You can upload images for the sky or ground. Adjust the size of the image by sliding the range. You can select the area of effect to choose either sky or ground. You can upload up to 5 ground images. After setting up, click the Apply button to save the changes.



vii. To activate remote connection to the server, ensure that the server address and antenna are correctly connected. After clicking Apply, the camera will support remote control. At this point, the controller will no longer control the camera..



- viii. Clicking on the Help button in the top left corner allows you to upgrade the firmware of the device.



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