

# HAYEAR

## HY-1070 Digital Microscope Camera



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## Foreword

HY-1070 is a multifunctional digital microscope individually designed, developed and manufactured by Shenzhen Hayear Electronics Co., Ltd. It realizes Full HD, high object distance, multifunction and multi-output at the same time. With help of the Hayear measuring software, it can easily meet many different requirements in many fields, such as industrial overhaul and teaching demonstration. And it's appearance design combines more ergonomic consideration, provides users with better experience. We sincerely wish this product can release your eyes and improve your work quality. Thanks for your support.

For your better use of this product, we hope you can keep this instruction well. Any damage caused by non-compliance with this manual shall be null and void.

Failure to comply with warnings and instructions may result in electric shock, fire and serious injury.

Failure to comply the instruction may cause the device permanent damage.

Storage and transportation: the improper transport may harm the device, make sure it was in well package in the packing box when transport to avoid damage.

Waste disposal: the electronic device is not household garbage, it needs to dealt with in accordance with relevant laws and regulations

In order to provide our guest with a better customer experience, the product may have minor change during perfecting. the description in this instruction is only for reference, please kindly understand it.

### ◆Safety

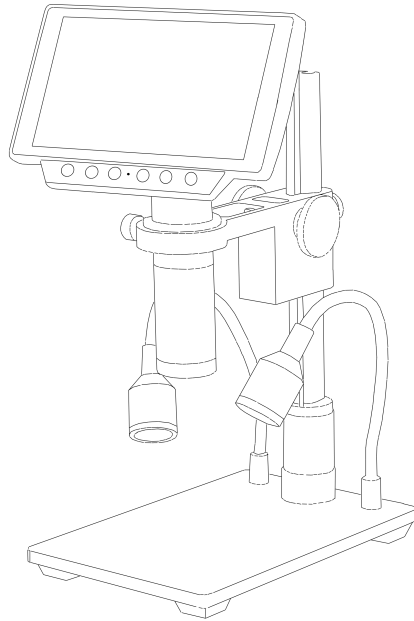
1. Keep the device in clean and dry environment, keep it far from oil, water, gas and any thing that may cause corrosion.
2. This product is not suitable for the disable, psychiatric and people with allergies.
3. Please keep away from the surrounding when operating.
4. Do not operate frequently, there is limited adjustment among the components, keep the device in balance to make sure it can work at its best.

### Basic Data

Image Sensor	16 Megapixel SONY CMOS 1/2.3 HD Sensor
Video Output	4K/2K/1080P Full HD (via HDMI) ;1080P (via USB)
Video Format	MP4
Magnification	Standard Magnification 150X (Max up to 300X)
Photo Resolution	16M 4608x3456, 14M 4320x3240,12M 4032x3024, Min 640x480
Photo Format	JPEG
Focus Range	5cm to 15cm
Frame Rate	4K 24@fps1080P 60@fps 720P 120@fps Max 240f/s (VGA )
Video Output	HDMI/USB
Storage	TF card storage, max to 64G
PC Support	Support Windows XP/7/8/10 system, including PC measuring software(gift)
WiFi	Microscope support WIFI connection (the connection range is about 15 meters)
Stand Size	17*12*20cm
Screen Size	5.1 inch (854x480)
Package Including	1*table stand, 1*power supply, 1*USB line, 1*HDMI line, 1*manual, 1*remote control,
Package Size	28*22*17cm/1.9Kg

# HY-1070 Parts Instruction

## ◆Main Device



\*Focus fixed screw: it can be used to adjust the compactness between the pulley and stand column to fix the focus

### How to increase the lens magnification?



**Standard working with 150x lens**



**2x attachment objective lens**

HY-1070 Standard working with 150x lens, if you add a 2x attachment objective lens then the original magnification also will double, that means it's a 300x lens.

## ◆Remote Control



\*Freeze screen: freeze screen image, can be operated under the standby, video and capture mode.

\* Digital magnification & digital reduction: digital zoom can up to 8X

\* Luminance+ & luminance-: exposure from +2.0 to -2.0

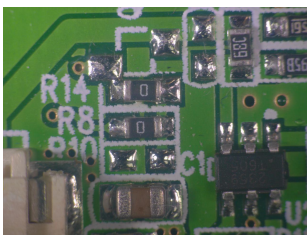
\* Lock/unlock: lock the file when recording to avoid delete by mistake.

\* Sharpness+ & sharpness-: there are three sharpness: high, medium and low, two buttons can switch the sharpness but the sequence is different.

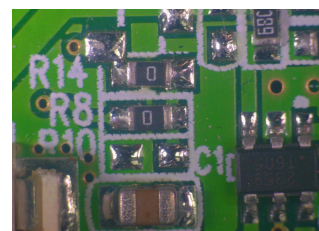
\* Contrast ratio+ & contrast ratio-: the principle is same as sharpness.

\* Inverse color: please take the below pictures as reference

normal

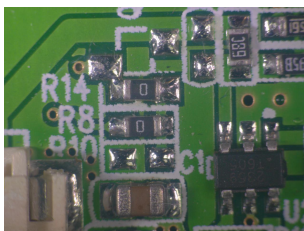


inverse

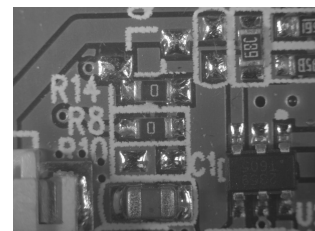


\* Black & white: please take the below pictures as reference

normal

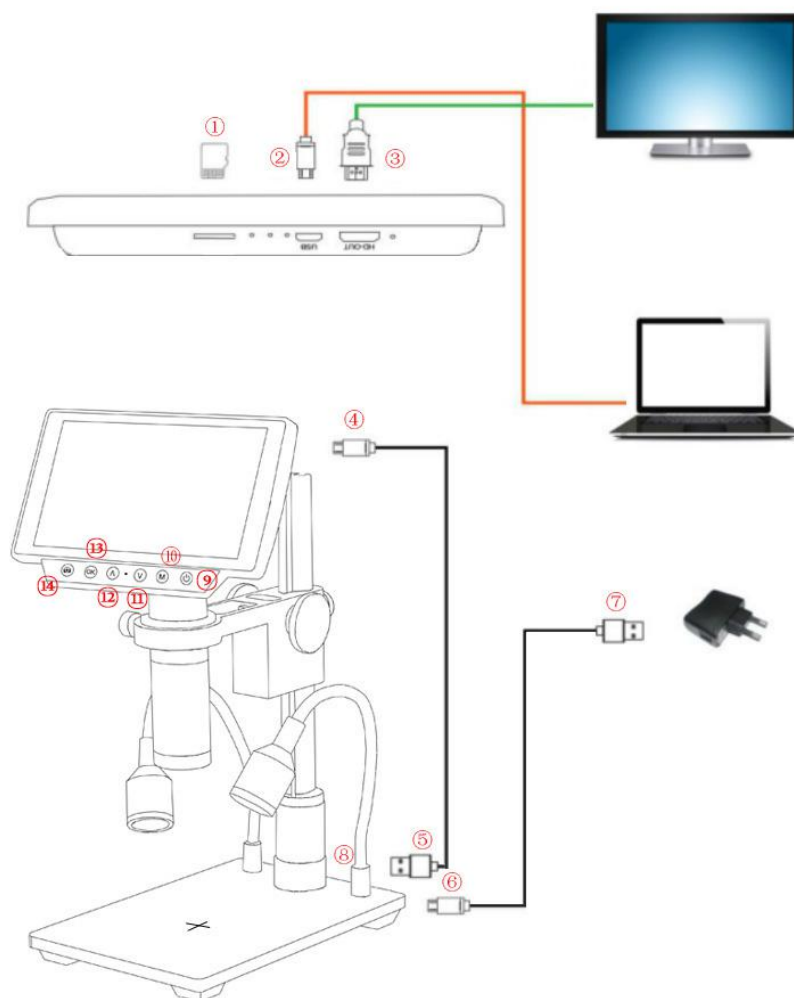


black & white



## connection and output

Besides of the output to the microscope screen itself, HY-1070 still has 3 kinds output as HDMI, USB and TF card storage. The below is an aerial view of the different ports of the main device, we will expand it in the later chapters.



①TF card storage ( to storage photo or video)	②USB output (output to the PC via USB line)
③HDMI output (output to the HDMI monitor via HDMI line)	④Microscope power supply
⑤USB power supply for microscope	⑥Base double lamp power supply
⑦USB DC in( provide power to microscope and LED light)	⑧LED light adjustment (control the brightness of the light)
⑨turn on/off button	⑩menu button
⑪button down	⑫button up
⑬confirm button	⑭mode switch(capture/video/view)

\*Battery: The product is reserved for battery installation slot with battery interface, and the interface size is 3.5mm. The product is not equipped with batteries; You can buy it on your own.

\*The product design battery is polymer battery, battery size: 42x30x5mm, working voltage 3.7v-4.2v, current 500ma-2000ma (the larger the current, the longer the standby time); The USB port can also be powered by a charger.

## Direction


### ◆ Individual Use


\*Power on


1. According to the **connection and output** chapter connect ④⑤⑥⑦ lines to the corresponding position, keep the power cord and switch on power.
2. Press on the “on/off” button on the main device. (usually the microscope will on automatically when power on)
3. Adjust the base double lamp brightness, angle, adjust the distance and manual focus to catch the needing image.
4. Press on the “up/down” button to adjust digital zoom.


\*switch mode


1. Short press on the “M” button to switch the mode. (also you can press on the remote control “MODE” button)
2. definition of the image under different mode:




:video standby mode

: capture mode

 ● : video mode

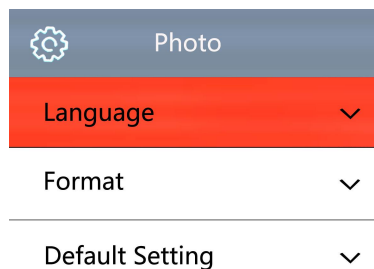
: image playback mode

:video playback mode (when the file is video, press on the “OK” button to play video file)

  ● :lock the file being recorded

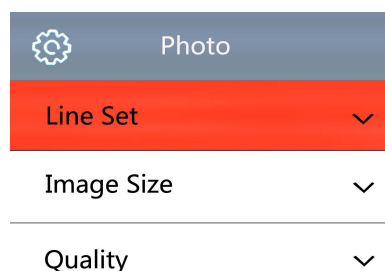
### Language select (take English as an example)

- Press on the MENU button to enter the main menu, press on the ↓ button to enter the language setting , again press on the ↓ button, when the English option highlight then press on the OK button to confirm.



### Line setting

- Under the capture mode, press on the MENU button to enter the main menu, select the line setting and press on the OK button to enter the line setting.



- Press on the OK button to select the option you need to set.
- When the option you need to set is highlight, press on the ↑ or the ↓ button to set it.

Line Set	
Cross Hair	OFF
Line	1
Direction	OFF
Position	79
Color	WHITE
Weight	1

### Image size setting

- Under the capture mode, press on the MENU button to enter the main menu, press on the ↓ button to select the image size setting and click OK button to enter, and then press on the ↑ or the ↓ button to set the image size you need.

Image Size	Image Size	Image Size
16M 4608 x 3456	10M 3648 x 2736	3M 2048 x 1536
14M 4032x 3240	8M 3264 x 2448	2MHD
12M 4032x 3024	5M 2592 x 1944	VGA 640 x 480

### Quality setting

- Under the capture mode, press on the MENU button to enter the main menu, press on the ↓ button till the quality setting highlight then press on the OK button, and then press on the ↑ or the ↓ button to set what you need.

Quality
Fine
Normal
Economy

### Sharpness setting

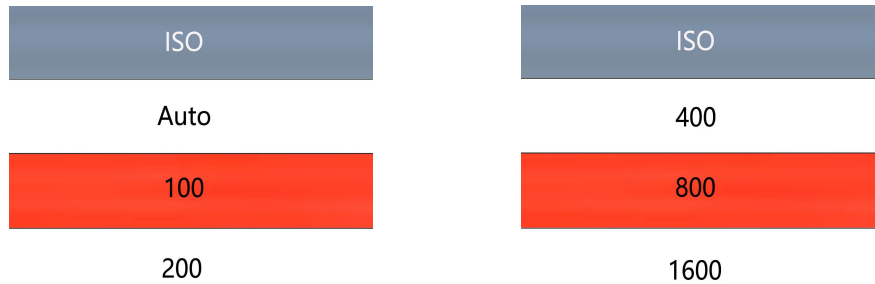
- Under the capture mode, press on the MENU button to enter the main menu, press on the ↓ button till the sharpness setting highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to set what you need.

Sharpness
High
Medium
Low



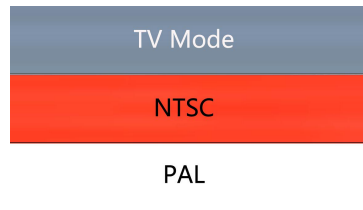
### ISO setting

● Under the capture mode, press on the MENU button to enter the main menu, press on the ↓ button till the ISO setting highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to set what you need.



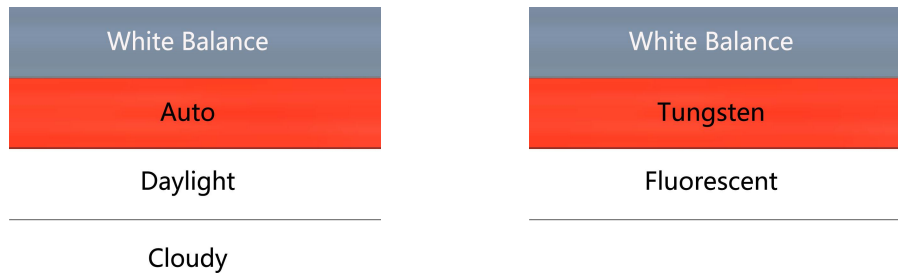
### TV mode setting

● Press on the MENU button to enter the main menu, press on the ↓ button till the TV mode setting highlight then press OK button to enter, and then press on the ↑ or the ↓ button to select NTSC or PAL mode.



### White balance setting

● Press on the MENU button to enter the main menu, press on the ↓ button till white balance setting highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to set.



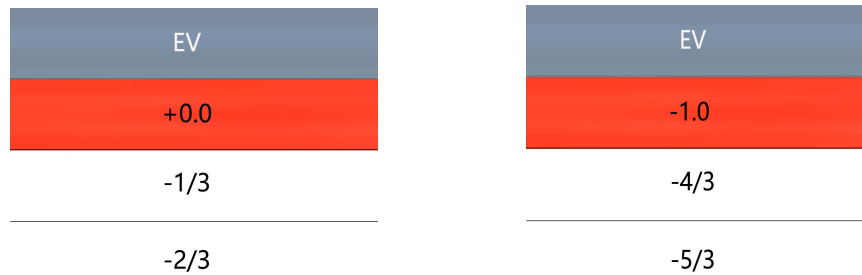
### Colour setting

● Press on the MENU button to enter the main menu, press the ↓ button till the colour setting option highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to set the colour you need.



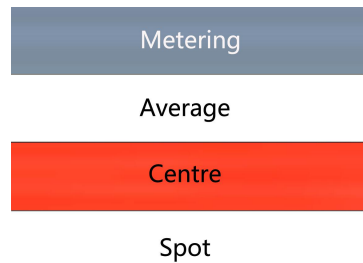
## EV setting

- Press on the MENU button to enter the main menu, press on the ↓ button till the EV setting option highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to set the EV you need.



## Metering

- Press on the MENU button to enter the main menu, press on the ↓ button till the metering option highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to select the metering you need.

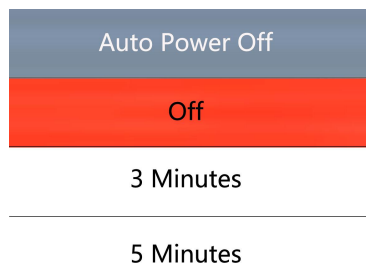


## Date/Time

- Press on the MENU button to enter the main menu, press on the ↓ button till the date/time option highlight then press on the OK button to enter, when the option is blue you can press on the ↑ or the ↓ button to set, after finishing an option press on the OK button to save and then set the other option, after finishing all setting, press on the MENU button to save setting and return the to main menu.

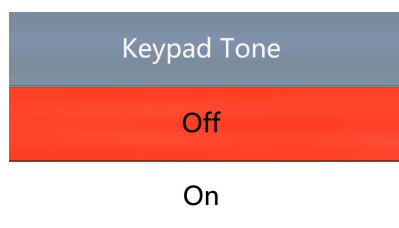
## Auto power off setting

- Press on the MENU button to enter main menu, press on the ↓ button till the auto power off setting option highlight and press OK button to enter, and then press on the ↑ or the ↓ button to select the auto power off time.



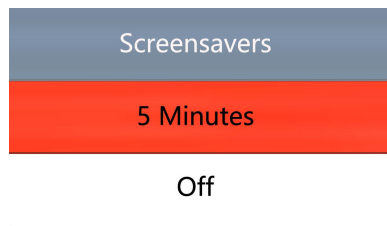
## Keypad Tone

- Press on the MENU button to enter the main menu, press on the ↓ button till the keypad tone option highlight and then press on the OK button to enter, and then press on the ↑ or the ↓ button to choose open or close the keypad tone.



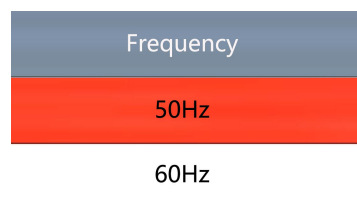
### Screensavers setting

- Press on the MENU button to enter the main menu, press on the ↓ button till the screensavers setting option highlight then press OK button to enter, and then press on the ↑ or the ↓ button to select setting.



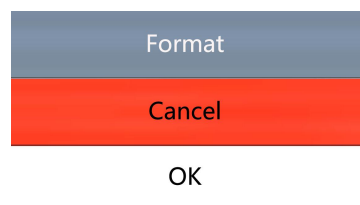
### Frequency setting

- Press on the MENU button to enter the main menu, press on the ↓ button till the frequency setting option highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to select 50Hz or 60Hz.



### TF card format setting

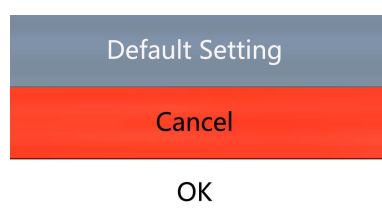
- Press on the MENU button to enter the main menu, press on the ↓ button till the TF card format setting option highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to select "cancel" or "OK" option, when select "cancel" and press on the OK button then it will return to main menu, when select "OK" and press on the OK button then the TF card will be format.



**Noting: all data will be deleted when use format, please make sure there is a copy when use this function**

### System setting

- Press on the MENU button to enter the main menu, press on the ↓ button till the default setting option highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to select "cancel" or "OK" option, when select "cancel" and press on the OK button then it will return to main menu, when select "OK" and press on the OK button then it will restore to factory settings.



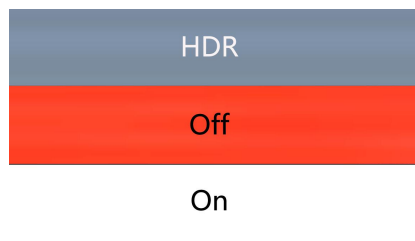
## Resolution setting

- Under the video mode, press on the MENU button to enter the main menu, press on the ↓ button till the resolution setting option highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to select the resolution you need.



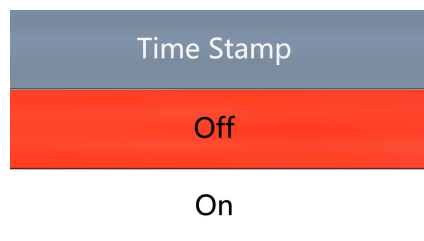
## HDR Setting

- Under the video mode, press on the MENU button to enter the main menu, press on the ↓ button till the HDR setting option highlight then press on OK button to enter, and then press on the ↑ or the ↓ button to select open or close.



## Date label setting

- Under the video mode, press on the MENU button to enter the main menu, press on the ↓ button till Date label setting option highlight then press on the OK button to enter, and then press on the ↑ or the ↓ button to select open or close



## \*Video setting menu

1. under the video standby mode, press on the "M" button on the main device till the menu appears on the screen( or press on the MENU button via the remote control)
2. Press on the up/down button to select the data you need to set, then press on the OK button to enter setting.
3. After finishing setting, press "M" button to return to video standby mode.

### **\*System setting menu**

1. Under the video standby mode, long press the "M" button on the main device till the menu is displayed on the screen and press the "M" button again. (or use the remote control to press the "MENU" button twice).
2. Press on the "up/down" button to select the data to be set, and press "OK" to enter the content to be set.
3. After finish setting, press "M" button to return to video standby mode.

### **\*Capture setting menu**

1. Under the capture mode long press "M" button. ( when use the remote control just press the "MENU" button under the capture mode )
2. Press on the "up/down" button to select the data to be set, and press "OK" to enter the content to be set.

### **\*Capture (three ways)**

1. Short press on the "M" button to enter the capture mode. click "OK" to take photos.
2. Just press on capture button.
3. When use the remote control, press on the capture button.

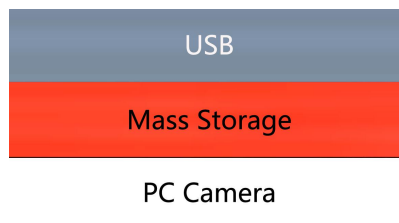
### **\* Video record step**

1. Under the video standby mode, press "OK" to start recording
2. Press "OK" again to stop recording

PS: When recording, press the lock/unlock button on the remote control to lock the file. When the memory card is full, the locked video file will not be covered by the new file.

## **PC terminal connection Settings**

When connect the microscope camera to the computer via the USB port , there are two options on the camera side, one is for storage, one is the camera.



- When you need the camera works as storage, select storage option then it can read the TF card.
- When you need the microscope works as a camera, select the camera then it is an USB camera.

## WiFi connect setting

First use

Step1: download APP

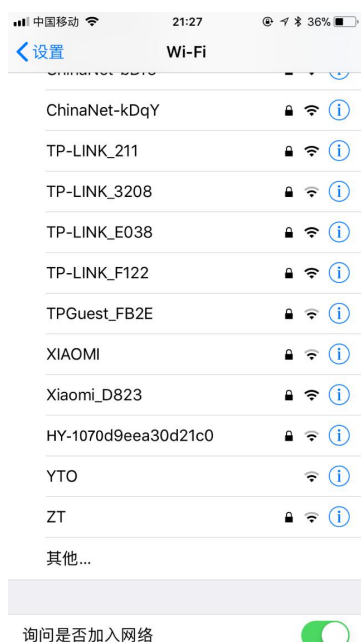
You can download it as follows:

IOS users search for "WiFi Camera" in the APP Store to download

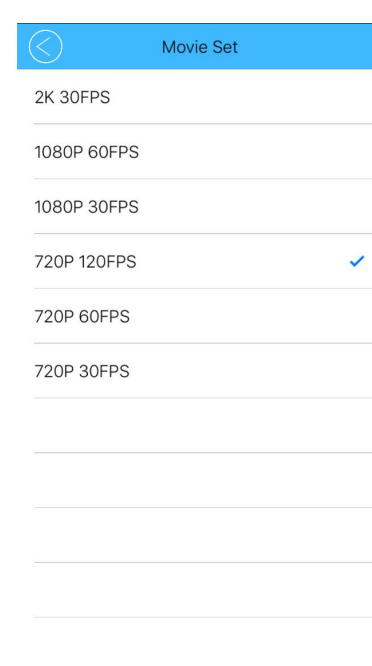
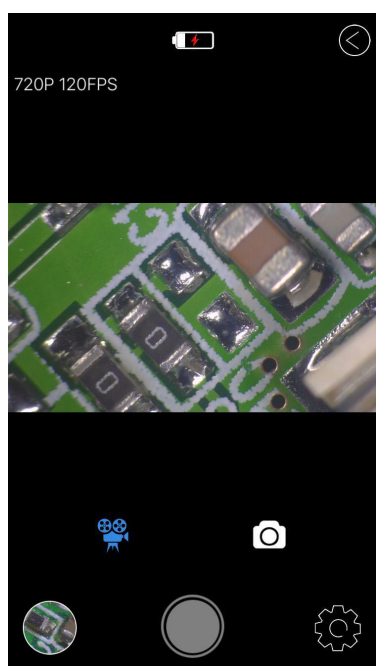
Android users search for "WiFi Camera" in application stores to download

First step: open the WIFI function through remote control, WIFI function can be only open by remote control, then it will display the account and password, the account is: HY-1070d9eea30d21c0 password: 12345678

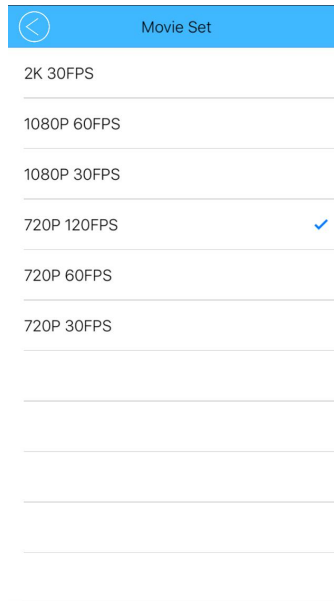
Second step: open the WIFI on the mobile phone, you can check the WIFI network HY-1070 then click to connect, it will show a tick when connect success, open the WiFi Action Camera APP to connect Camera.



This is the image of a successful connection.



1. You can adjust the Settings for photo and video resolution, white balance, exposure and so on. The image below is the default resolution.



## HDMI output

First, make sure the connected monitor is hd monitor, otherwise the resolution can not reach 1080P

Second, power on the microscope and connect it to the hd monitor, make sure there is power on when using since there is no built-in battery.

Third, turn on the microscope, put the observation on the platform and adjust the working distance, the video signal will switch when you connect the microscope to other device, therefore the screen itself can not work under the HDMI output.

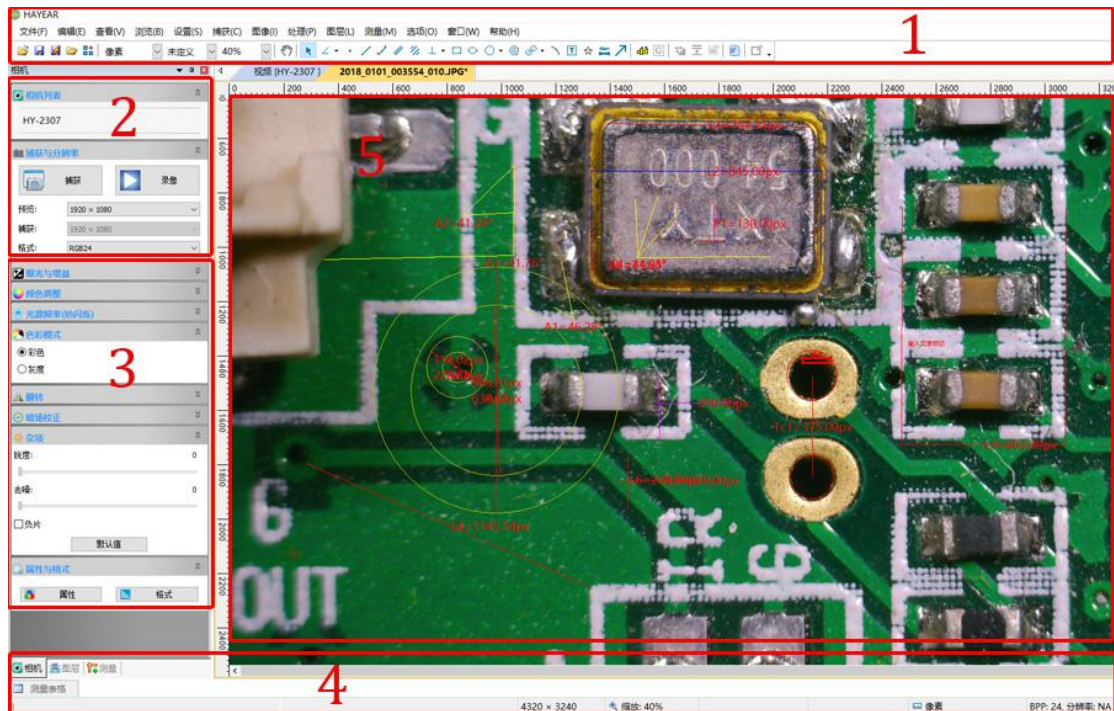
Under the HDMI output, the microscope can take picture, but can not record video.

## FAQ

1. Why there is no image on the monitor?  
Check if all the lines connected properly and power switch is turn on.
2. Why the image vague?  
Please adjust the focal distance, lighting angle, check if there is dirt on the lens.
3. Why the remote control can not work?  
There is no battery in the package, check if you has installed it.
4. Why there is no image on monitor when playback?  
Maybe the video is not kept intact, or the video file is too large, and the system needs run time.
5. Why isn't the photograph clear?  
Please check whether the photo setting is the highest pixel.
6. Why it shows the TF card error?  
First make sure it is a certified memory card, then format it and try again.

# USB Output

## HAYEAR User Manual



### Overview

Hayear is an application for imaging a dynamic image processing , it has the following characteristics:

1. Support a variety of cameras, can switch at any time to use.
2. using GPU rendering for image previewing, support for live image display of high-resolution and high frame rates.
3. Support dynamic image measurement function.
4. The software interface is easy to operate.

### User Interface

1. Toolbar: Take pictures/Recording video/Browse files.
2. Sidebar tab: Switching the rightmost control panels, currently provides camera control and measurement functions.
3. Control panel: Specific camera control and measurement operations.
4. Status bar: Display camera information, Change user interface view, Toggle measure result panel.
5. Main menu: Open setting dialog, show software information, etc.

### Capture Images

You can capture pictures and videos:

1. Take a picture: Click "Snap" button to take a picture. Click the right arrow beside the "Snap" button to set picture file format and resolution.
2. Recording: Click "Record" button to start video recording, Click again to stop recording. When recording ,there will be an animation indicator over the image.
3. Browse: Click "Browse" button to open the folder where pictures and video stored.





## Camera Control

	<p>Device Control:</p> <ul style="list-style-type: none"> <li>● Support different cameras, preview resolution and output format.</li> <li>● The highest resolution is 1920x1080.</li> </ul>
	<p>Exposure and Gain: If the connected camera can not support some functions such as brightness target value, then the corresponding parameter can not be set up</p>
	<p>White balance: If the connected camera can not support some functions such as brightness target value, then the corresponding parameter can not be set up</p> <p>Red, Green and Blue gain: If the connected camera can not support some functions such as brightness target value, then the corresponding parameter can not be set up</p>
	<p>Normal camera parameter adjustment.</p>
	<ul style="list-style-type: none"> <li>● Reset camera parameters.</li> <li>● Open camera property dialog, generally supported by the DirectShow cameras</li> </ul>

## Measurement

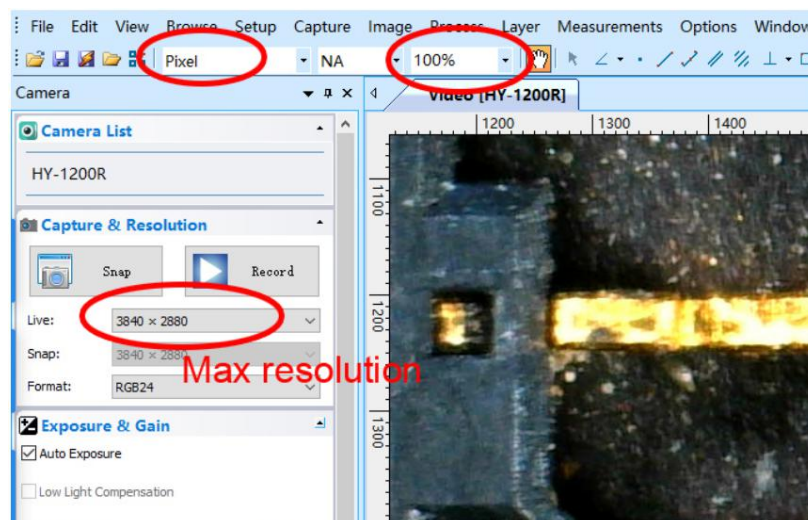
Icon	Function	Description
	Move	Move or adjust the measurement tool.
	Point	Setup > Video Overlay > Marker
	Line	Measure length of a line.

⊥	Vertical	
□	Rectangle	Measure perimeter and acreage of a rectangle.
☆	Polygon	Measure perimeter and acreage of a polygon.
○	Circle	Measure a circle, the circle is determined by center point and radius.
○	Two Points Circle	Measure a circle, the circle is determined by two points.
○	Three Points Circle	Measure a circle, the circle is determined by three points.
⤿	Arc	Measure length of arc.
∠	Angle	Measure angle.
📏	Calibrate	
10mm	Scale Bar	
T	Text	Delete all measurement tools.
📐	Stitch	

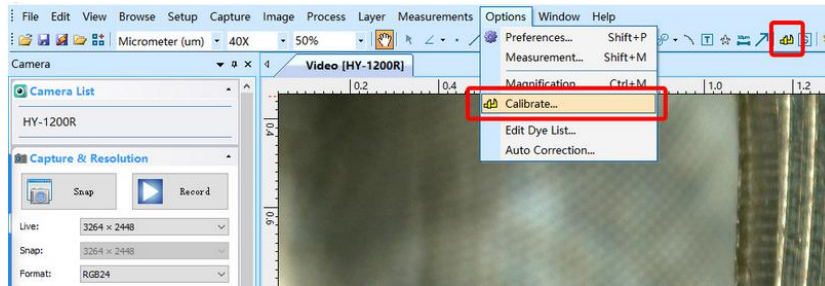
## How to calibration?

### The way to calibration

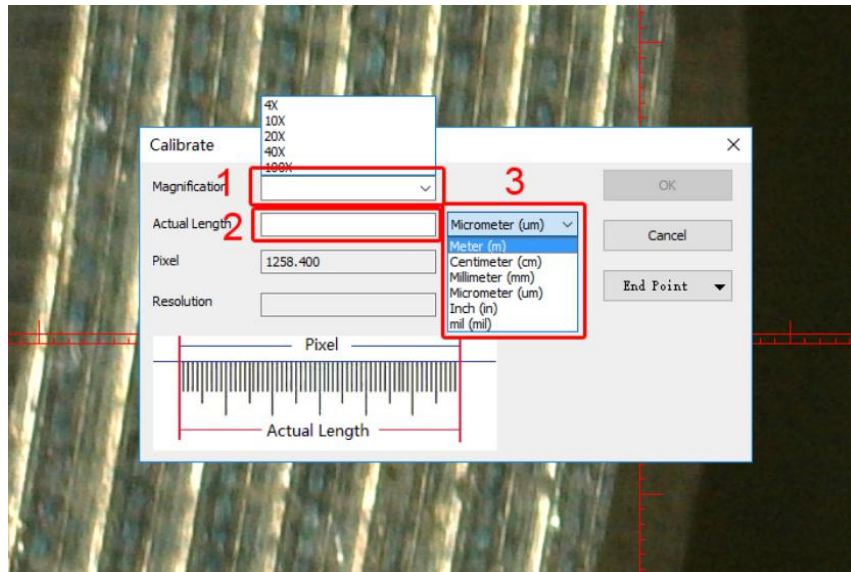
1. Calibration: select pixel, 100%, max resolution



2. Click on the "option" to select "calibration"



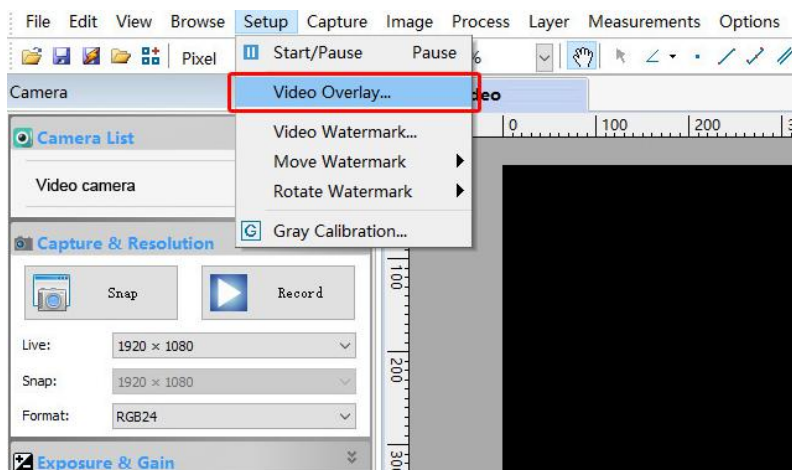
### 3. Calibration: Magnification, Actual Length, Meter

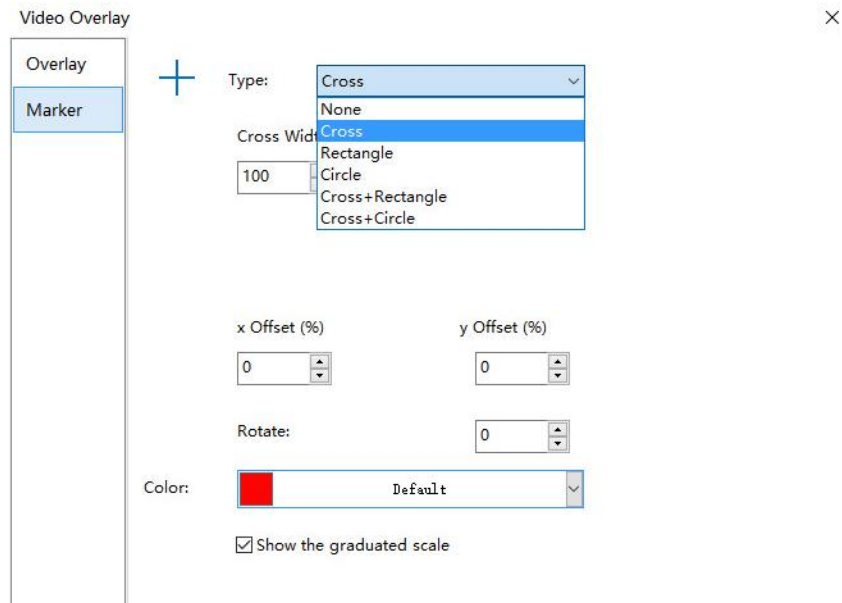


4. After select " calibration", choose the unit and multiplying power you need, then you can calibrate.

## How to set cross hair on measure software?

1. First step: select setup
2. Second step: select video overlay
3. Third step: select the Cross in Type





## Software Installation

Download the software:  
<http://www.hayear.com>

The “HAYEAR” can support only the Windows system, the users can also download by the link on the official website.

The operating systems:

Windows 7、 Windows8、 Windows10、 Linux

The operating environment:

Microsoft.Net Framework 4.0 , Microsoft Visual C++ 2010

If there is no the two complete runtime library, there will be an error when installing the software.

If you are unable to enter the link or download the files, please contact with the customer service.

After downloading successfully, open the zipped files and install the software.

## FAQ

1. Why there says “missing files” during installation or initiator procedure?

Please confirm that in the system there are Microsoft. Net Framework 4.0 and Microsoft Visual C++ 2010 Runtimes.

2. The software works fine, but the software can not recognize the microscope.

First, please make sure that you connect the camera and the PC properly and choose “PC camera” on the 5 inch monitor. Second, if there is still no image, please check the “Device Manager” of your PC, delete the “USB Camera” in the “Imaging devices” and rescan . Let the system identifies again. After all, in the “Imaging devices” there will show another name, which is “HY-1070 Camera” . Then restart the software.

3. Why there is a measurement error?

First, if you want to get a more precise result, you need to use a more precise calibration. Second, during the whole process, make sure the magnification is always the same as the one when you set the calibration. Since the camera is continuously magnifying, you’ d better keep the same object distance also.

## Thanks

Thanks all of you for supporting our products. We hope you enjoy our products, and would be glad if they can even just slightly make your life better. If you have any question, or any advice and feedbacks, feel free to contact us: [info@hayear.com](mailto:info@hayear.com) . We'd like to provide the best service to you. Our official website is <http://www.hayear.com/>. We reserve all the right for the final explanation.

Warranty		
User's name :	Address :	
Phone number :	Post code :	email :
Model name :	Purchase date :	
Fault feedback :		
Date :	Fault :	
Notice :		
Our warranty doesn't cover:		
1	If users can not provide the purchase proof or the Warranty.	
2	If users use it in an improper environment, such as incompatible power supply, high temperature environment etc.	
3	If the fault caused by accident, oversight, misoperation or natural disasters etc.	
4	If the fault caused by people who are not belong to authorized organizations of our company during repacking, repair, dismantle, Or if users repack, repair or dismantle the device not following our advice.	
5	Out of warranty period.	

