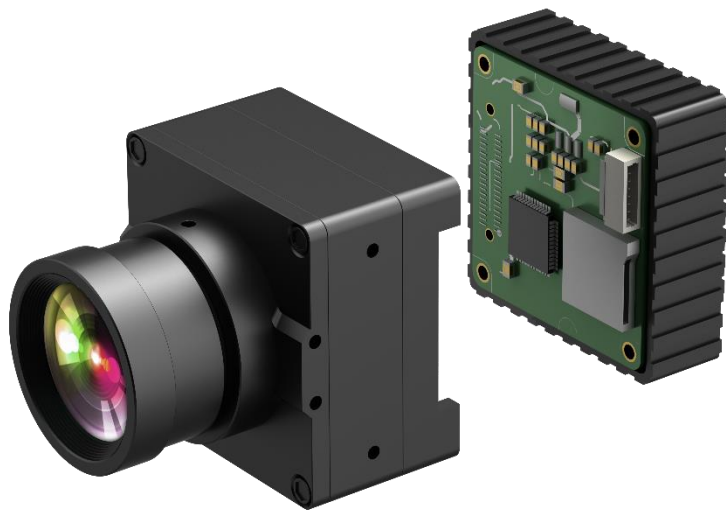


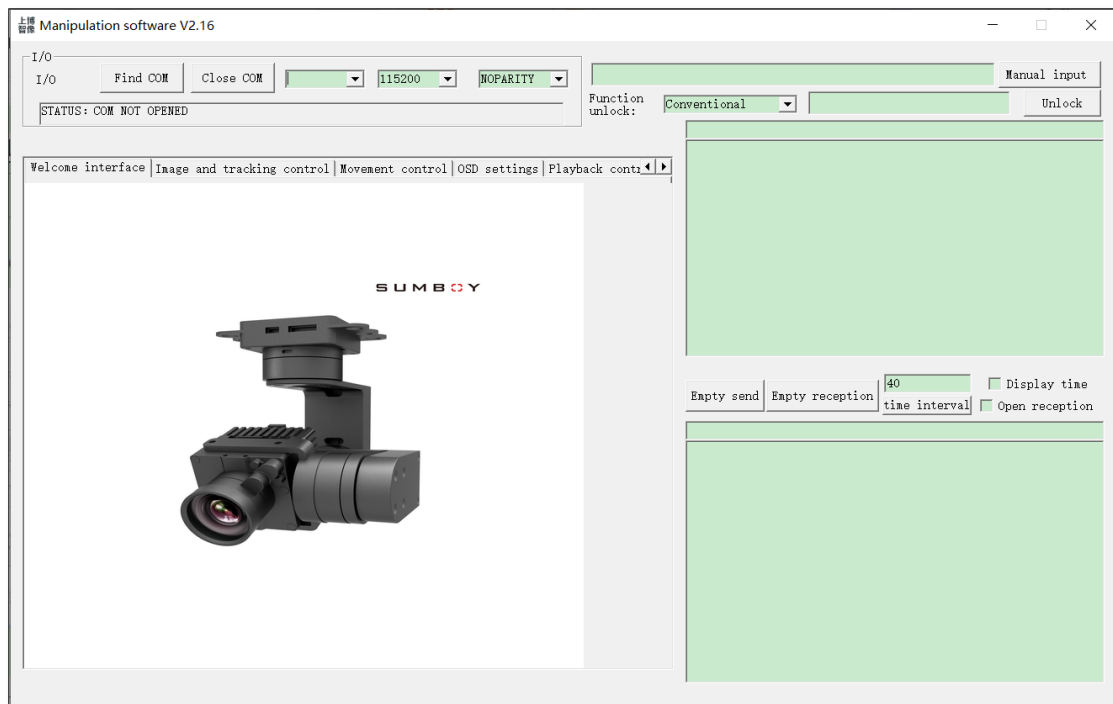
IR and Tracker **Software Instruction**

V2.17

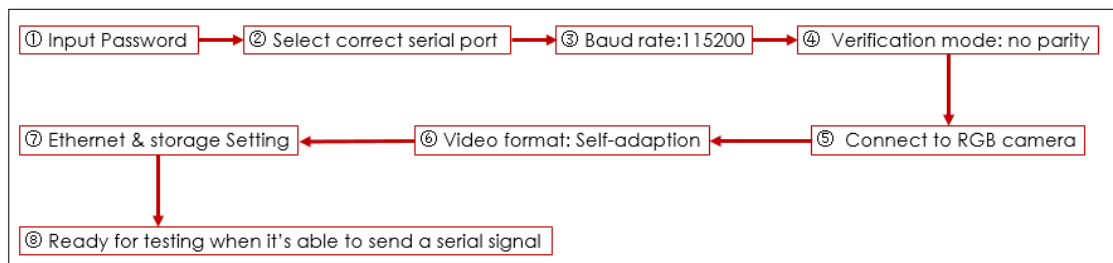


Software Instruction

1. Main page



2. Communication connection workflow



3. Software instruction

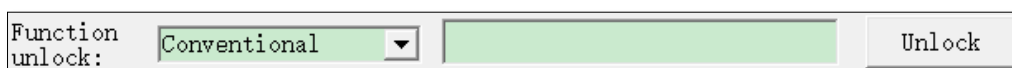
3.1 Input password

1. Unlock common function permissions

Conventional function unlock passwords: ZXCG001A

Conventional function includes: image & tracking control, IR sensor control, OSD setting and display control

2. Please contact us for unlocking other functions

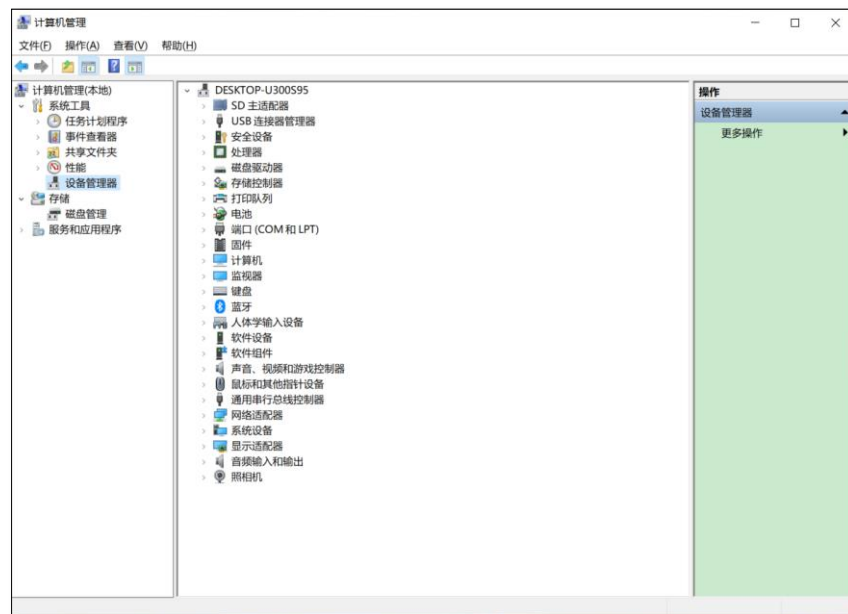


Pic 1

3.2 Serial port connection

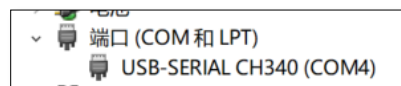
Press "Find COM" and could see all the serial port numbers from the dropdown list, if there are quite many serial port numbers that are hard to find, then please refer to the below procedure to find the corresponding COM#.

1. Right-click "My Computer", and select Properties then the window below will show up (please install CH340 driver when no serial port number or exclamation mark shows up). Normally the serial port number is the one comes up after controlling cable being connected.



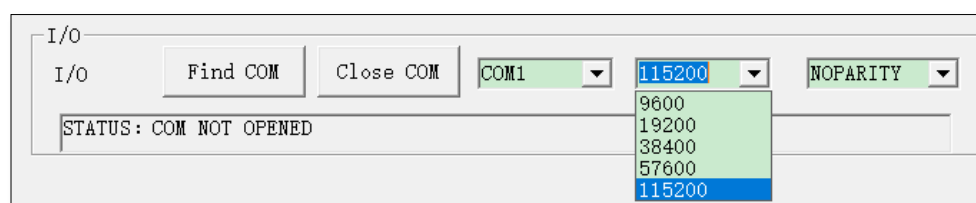
Pic 2

2. Double-click the port (COM and LPT), choose the refreshed USB port, as shown in the picture



Pic 3

3. Click the drop-down list of I/O ID, select the corresponding serial number (Status: opened, the port is well connected)



Pic 4

3.3 OSD setting

3.3.1 Core selection

As shown in Pic 5:

1. Please select "Sony7520" for Sony camera cores;
2. Please select "Homemade machine 2" for domestic camera cores;
3. Please select "Sony7520" for Tamron 10X camera core.

3.3.2 Display configuration

1. Please tick the options as shown in Pic 5 when testing, then press "OSD settings" to complete the operation, which is a must when change and save display configuration.
2. Press "get SysTime" to acquire and display system time
3. Set time and longitude & latitude data in OSD, which could be found in property of the pictures saved

The screenshot shows a software interface with a tabbed menu at the top: "Welcome interface", "Image and tracking control", "Movement control", "OSD settings" (selected), and "Playback control".

Callout ① points to the "OSD settings" tab.

Callout ② points to a dropdown menu at the top left, which currently shows "Sony7520".

Below the dropdown are several checkboxes:

- ☐ Hide OSD
- ☐ Hide attitude angle
- ☒ Time input
- ☐ Hide cross frame
- ☐ GPS is relative coordinate
- ☒ GPS input
- ☐ Field/amplifier input
- ☐ Hidden field of view
- ☐ Field angle display
- ☐ Hiding time
- ☒ Save the OSD setting parameters
- ☐ Hide GPS
- ☐ All States display the miss distance and state
- ☐ Big font
- ☐ Cloud platform angle input
- ☐ Hide character border

Below the checkboxes are input fields for angles and GPS coordinates:

Heading angle	<input type="text" value="0"/>	GPS_N	<input type="text" value="0"/>
Pitching angle	<input type="text" value="0"/>	GPS_E	<input type="text" value="0"/>
Roll angle	<input type="text" value="0"/>	GPS_H	<input type="text" value="0"/>

At the bottom, there are input fields for time:

<input type="text" value="2019"/>	Year	<input type="text" value="5"/>	Month	<input type="text" value="30"/>	Day
<input type="text" value="9"/>	Hour	<input type="text" value="4"/>	Minute	<input type="text" value="21"/>	Second

Callout ③ points to a button labeled "OSD settings" at the bottom right.

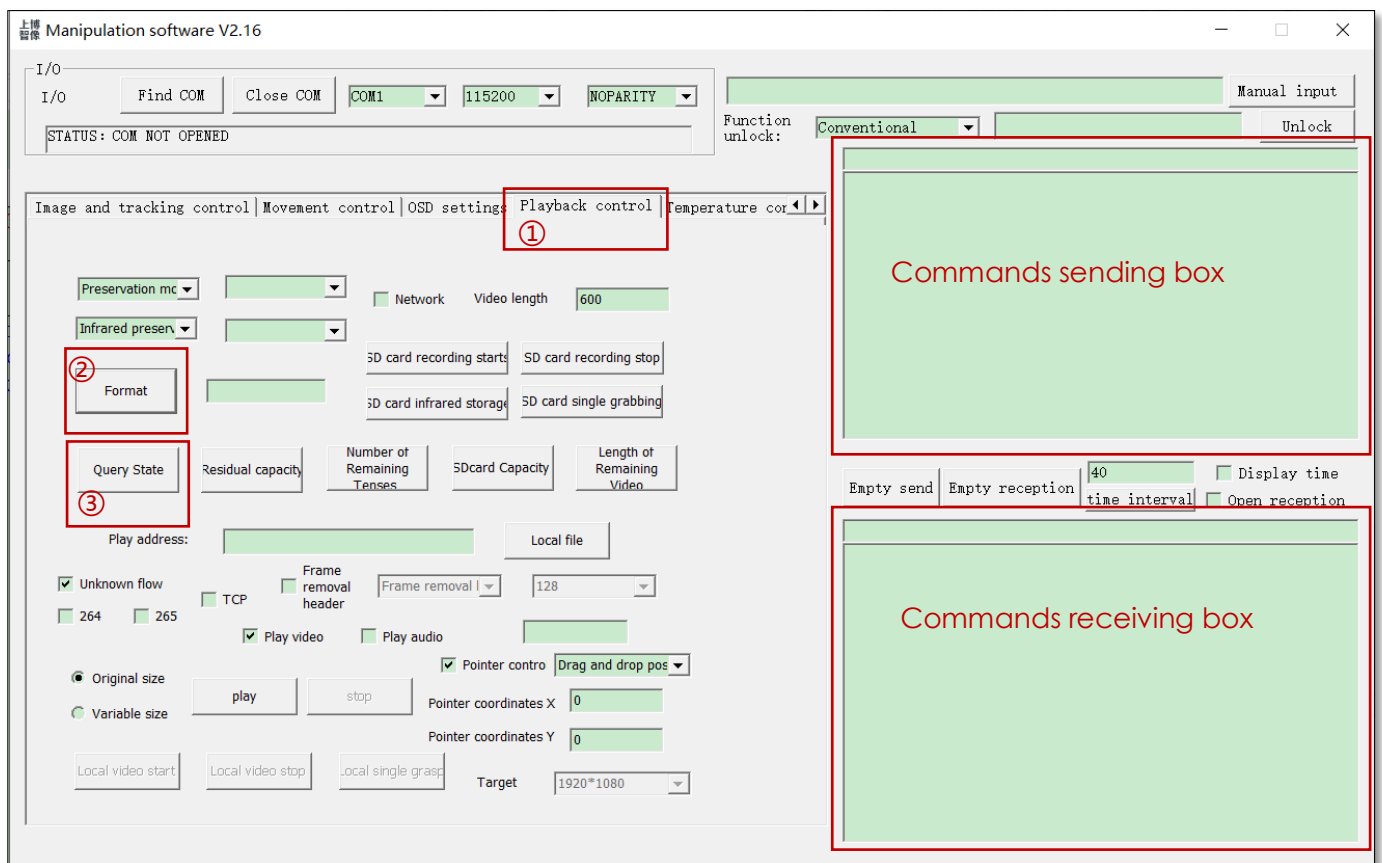
Callout ④ points to a button labeled "get SysTime" above the "OSD settings" button.

Pic 5

3.4 Play back control

3.4.1 Save setting

1. Start and stop video recording as well as snap shots saved to SD card could be modified here, user could also change the length of video that has been taken;
2. SD card status. Click "Query State" then the status information would show up in commands receiving box as Pic 6, data of "Residual capacity", "Number of Remaining Tenses", "SD card Capacity" and "Length of Remaining Video" shall also be shown up in the box when user press the corresponding button;
3. When user choose to "Format" the SD card, the status will show up on receiving box.

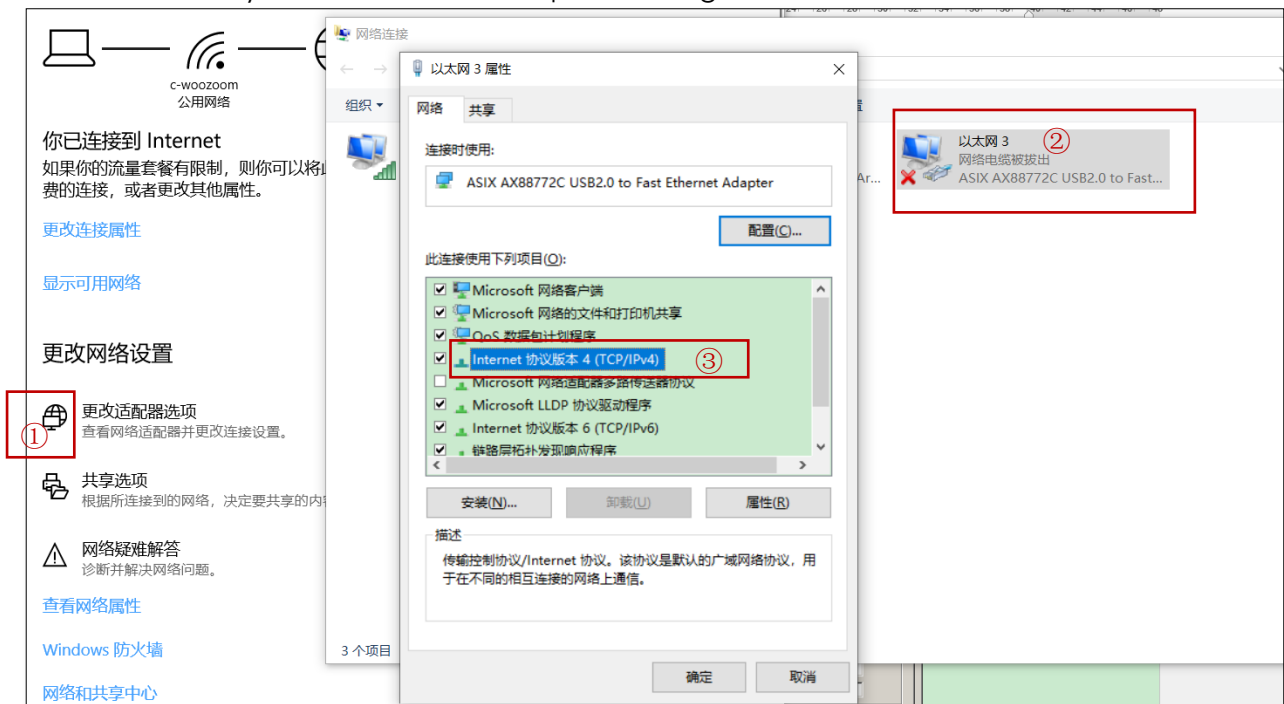


Pic 6

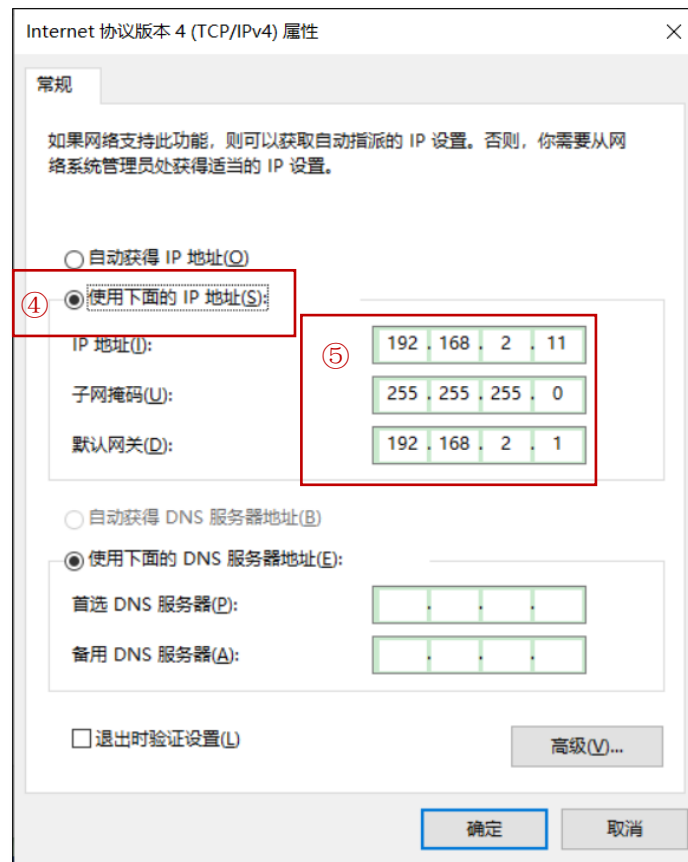
3.4.2 Display settings

1. Open "Control panel" → "Network and sharing center", click "Local connectivity" icon, find "property" and double click "Internet protocol version (TCP/IPv4)" as shown in Pic 7, and please set the IP address and gateway at the same segment as the device but different values as Pic 8 (Note: no setting for

DNS server), click confirm to complete setting.



Pic 7



Pic 8

2. Input "rtsp://192.168.2.119/554" to play address to view the live video stream via the software. The format of video stream is "Unknown flow" as default. When no image showing up, please re-connect all the cables and reboot the system, and please tick H264 or H265 for displaying the images.
3. Displaying TCP video streams, please tick "TCP" otherwise shall not receive images.
4. If user needs to remove frame header, please tick "Frame removal header", user could either select 2 bytes, 3 bytes or 13 bytes as removed frame headers, the size of data package is either 128 bytes or 256 bytes.
5. When video plays, user could tick "Play audio" if there's also audio data.
6. Please adjust the size of video between "Original size" and "Variable size" before plays the video. If user would like to move the display window, please tick "pointer control" and select "drag and drop position". If user looks for click mouse to track target, then please select "track" in the dropdown list.
7. User could record or snap shot the video to local disk.

The screenshot shows a video player control interface with the following elements:

- Preservation mc** and **Infrared preserv** dropdown menus.
- Network** checkbox and **Video length** input field (600).
- Format** button and a green input field.
- SD card recording starts** and **SD card recording stop** buttons.
- SD card infrared storage** and **SD card single grabbing** buttons.
- Query State**, **Residual capacity**, **Number of Remaining Tenses**, **SDcard Capacity**, and **Length of Remaining Video** buttons.
- Play address:** text field containing `rtsp : //192.168.2.119/554` (highlighted with a red box).
- Local file** button.
- Unknown flow** (checked), **264**, **265** checkboxes.
- TCP** checkbox.
- Frame removal header** checkbox and **Frame removal l** dropdown menu (128).
- Play video** (checked) and **Play audio** checkboxes.
- Original size** (selected) and **Variable size** radio buttons.
- play** and **stop** buttons (the **play** button is highlighted with a red box).
- Pointer contro** (checked) checkbox and **Drag and drop pos** dropdown menu (highlighted with a red box).
- Pointer coordinates X** and **Pointer coordinates Y** input fields (both 0).
- Local video start**, **Local video stop**, and **Local single grasp** buttons.
- Target** dropdown menu (1920*1080).

Pic 9

8. In the dropdown list of "Pointer control", there are options "Track", "Single point temperature measurement" and "Reginal temperature measurement".


a. Track: user could double click on the target on the screen to track, while showing the coordinates of the target and its size.

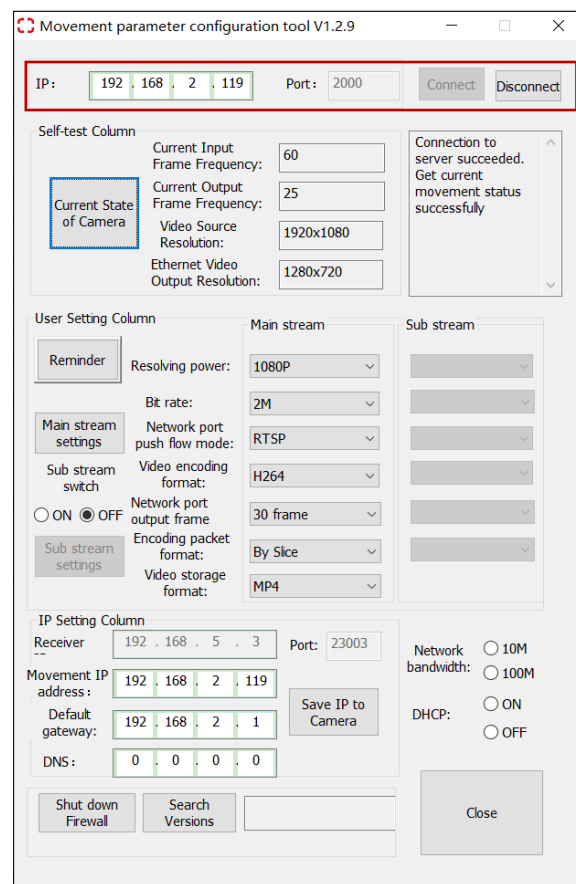
b. Single point temperature measurement: (only for IR sensor that has temperature measurement function) click on any point on the screen, then the temperature and coordinates of that point shall show up.

c. Reginal temperature measurement: (only for IR sensor that has temperature measurement function) drag to draw a frame on the display, then the highest and lowest temperatures of that region will show up.

3.5 Movement control

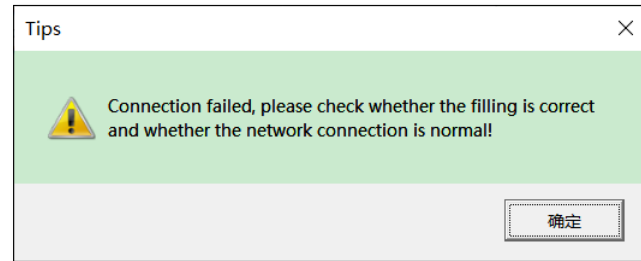
3.5.1 Connection

1. Find and open  Movement parameter configuration tool in the software file and the IP address of standard version device is "192.168.2.119", please click "Connection".



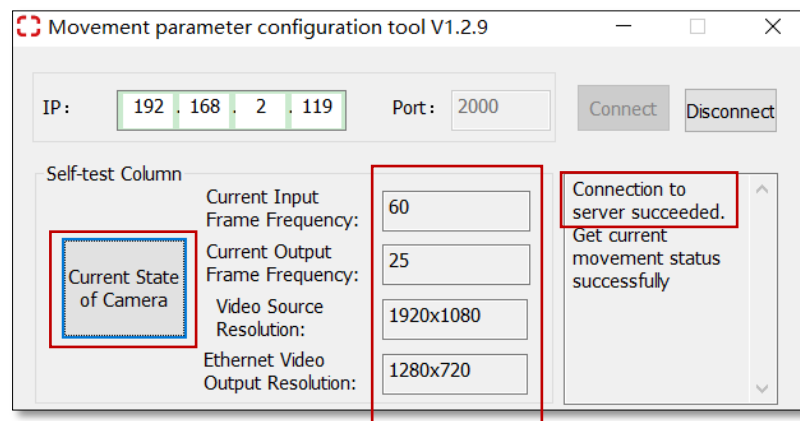
Pic 10

2. If no image comes out in 10 seconds after clicking the “Connection” button. The below window shall pop up, then please check the cable connection between IR camera and PC.



Pic 11

3.If connection completes, a notification shall show up on the right information box saying “Connection to server succeeded” and the “Connection” button turns to gray and shall not be pressed anymore and the disconnect button will be accessible.



Pic 12

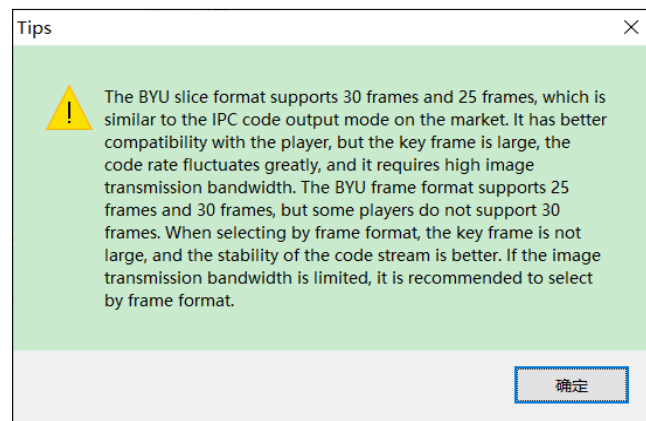
3.5.2 Check the current condition of camera core

1. When connection is successfully done, user presses “current State of Camera” to see the Ethernet video output of the camera core.
2. User will have to check the Ethernet connection if anyone or many of the four values turns out zero and no image showing up via Ethernet connection.

Note: Frame Frequency value might be zero when device is just powered on, please re-press “Current State of Camera” button.

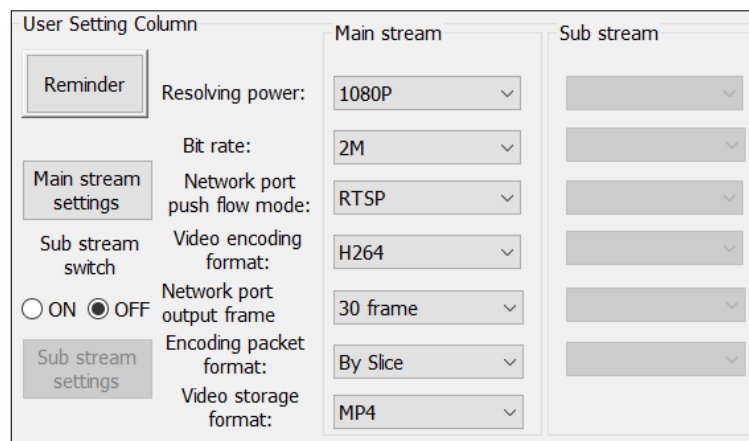
3.5.3 User setting column

Please click “Reminder” before setting and the below window shows up.



Pic 13

Please click “Main stream settings” to save all the settings under “Main stream” column.



Pic 14

- 1) Resolving power (resolution): Ethernet output supports 720P: 1280x720, 1080P: 1920x1080;
- 2) Bit rate: for 720P: 1M, 1.5M, 2M; for 1080P: 1M, 1.5M, 2M, 3M, 4M upon clients' needs;
- 3) Network port push flow mode: supports UDP video stream push flow and RTSP push flow mode;
- 4) Video encoding format: supports H264 and H265;
- 5) Network port output frame: supports 20Hz and 30 Hz;
- 6) Encoding packet format: supports “By Slice” and “By Frame” video encoding packet formats;
- 7) Video storage format: supports MP4, H264 and H265.

3.5.4 IP setting

1. IP setting under RTSP mode:

Please input correct IP address of the camera core (last value shall any value between 2~254) and gateway (last value shall be any value between 1~254) but the values have to be different from those of PC and IP address and gateway address shall in same network segment;

2. IP setting under UDP mode:

Under default settings, users cannot input values to receiver and port unless they select "UDP Bare flow" under Main stream column as shown in Pic 15. Please input the correct IP address of the camera core (last value shall any value between 2~254) and gateway (last value shall be any value between 1~254) and click "Save IP to Camera" to complete the IP setting.

The image shows a software configuration window with two main sections: 'User Setting Column' and 'IP Setting Column'.

User Setting Column:

- Main stream:**
 - Resolving power: 1080P
 - Bit rate: 2M
 - Network port push flow mode: UDP Bare flow (highlighted with a red box)
 - Video encoding format: H264
 - Network port output frame: 30 frame
 - Encoding packet format: By Slice
 - Video storage format: MP4
- Sub stream switch:** Radio buttons for ON and OFF.
- Sub stream settings:** A button to configure sub-streams.

IP Setting Column:

- Receiver:** IP address 192.168.5.3 and Port 23003 (both highlighted with a red box).
- Movement IP address:** 192.168.2.119
- Default gateway:** 192.168.2.1
- DNS:** 0.0.0.0
- Buttons:** 'Save IP to Camera', 'Shut down Firewall', and 'Search Versions'.

Pic 15

3. IP setting is successfully set when information shows up on the right column, then please reboot the IR camera, if there's no information or saying failure, please try again.

Note: 1. Please memorize the IP address after changing it, otherwise may cause failure of connection.

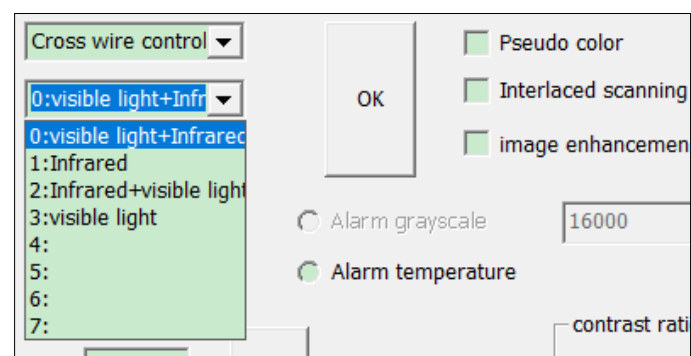
2. If gateway has been changed, please update that of PC accordingly.

"Search Version" is for software upgrading only.

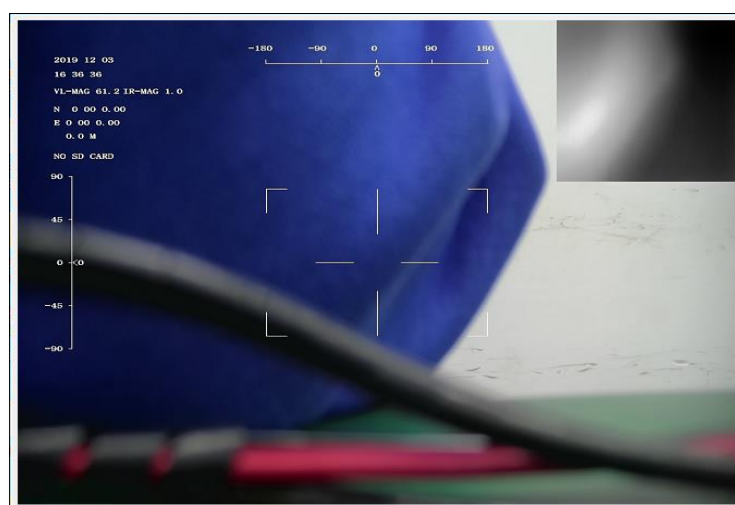
3.6 Image and tracking control

3.6.1 Image setting

1. Go back to the IR & Tracker Software and user shall have five types of display modes to choose for display: 0:"visible light + infrared" (visible light as main display while IR minor shown as Pic 17); 1: "infrared" (single IR); 2. "Infrared + visible light" (IR main, visible light minor); 3. "Visible light" (single RGB).



Pic 16

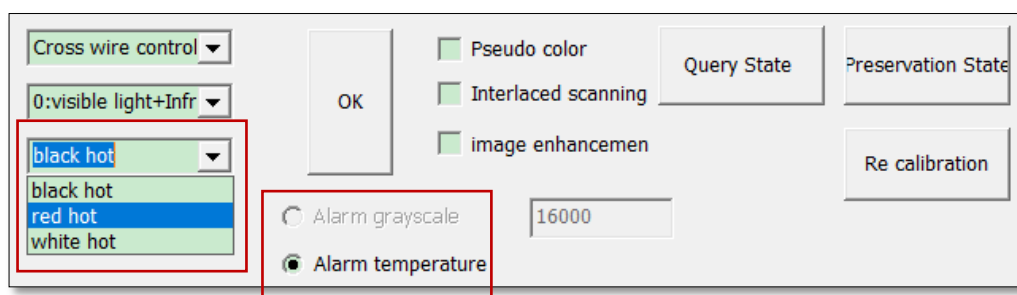


Pic 17

2. IR display mode: white hot, black hot and red hot.

1) If the IR camera has temperature measurement function, please open it by ticking "Alarm temperature" and then software will jump to temperature setting page, where user could input values between 0~120°C with accuracy to two decimal places;

2) If the IR camera does not have temperature measurement function, but user still needs temperature alarm, please select "red hot" display mode and adjust the "Alarm grayscale" as a integer range between 0~16383.



Pic 18

3. Other display settings: user could also select "Pseudo color", "Interlaced scanning", "image enhancement" display settings.

4. Query State: press "Query State" to see the IR camera's state previously saved.

5. Preservation State: press "Preservation State" after all the settings completed, when user re-powers on the camera, press "Query State" button then it will go back to the settings of "Preservation State".

6. Re-calibration

1) Put the IR camera toward a black color board and let it fill the full of FOV;

2) Press "Re-calibration";

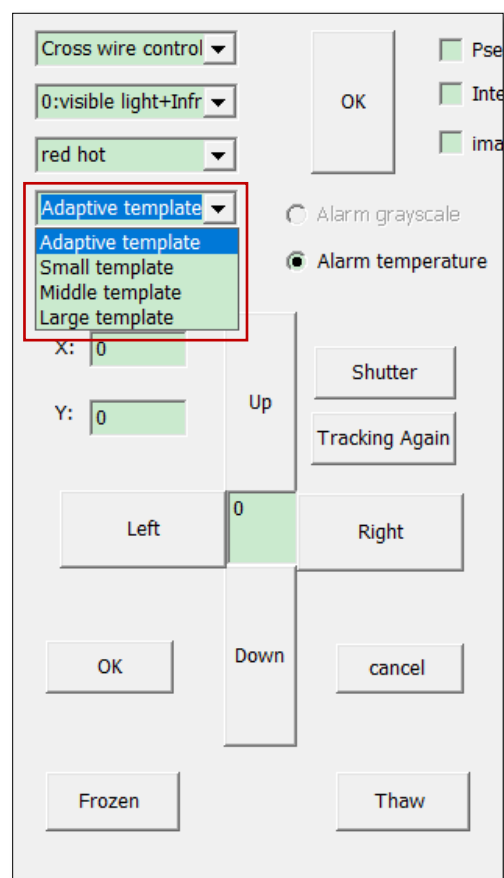
3) Keep the IR camera being covered by the black board till it receiving notification of re-calibration completed, which would take 1 minutes normally.

Note: please power off the IR camera after receiving notification of re-calibration succeeded, otherwise the image might be wrong.

3.6.2 Tracking settings

1. Select "Cross wire control";
2. Adaptive template: the IR camera/tracker automatically adjust the size of tracking frame on real-time basis; if user would like the size of tracking frame to be fixed, he could select either "Small template", "Middle template" or "Large template" from the dropdown list, "Adaptive template" is the default option;
3. Single click any of the direction button, the tracking cross will then show up (displacement value and coordinates of the cross are adjustable);
4. Move the cross to select a target to lock by pressing "OK", then cross turns into tracking frame on the target;
5. Press "cancel" to stop tracking;
6. Track again: click "Track again" to relocate the target and click "OK" to lock it, click "cancel" to stop tracking.

Note: target should be any object with clear profile.



Pic 19

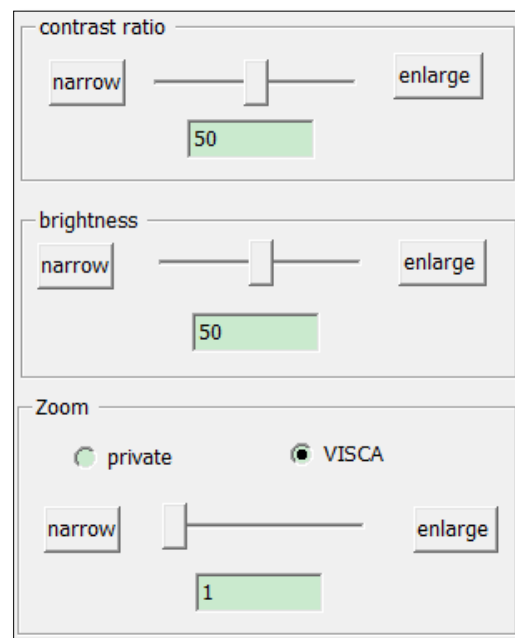
3.6.3 Other settings

Contrast ratio and brightness:

1. Modify contrast and brightness by moving the sliding button;
2. Press "narrow" or "enlarge" could also adjust contrast and brightness.

Zoom:

1. VISCA is for visible light camera zooming operation, click "narrow" or "enlarge" or move the sliding button could adjust zooming;
2. Private protocol is for IR camera zooming operation, click "narrow" or "enlarge" or move the sliding button could adjust zooming.

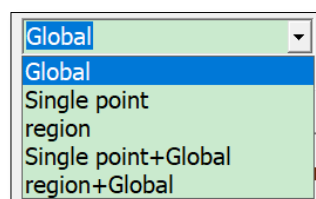


Pic 20

3.7 Temperature measurement

3.7.1 Temperature control

Temperature control window is shown as Pic 21, which has 5 modes of temperature measurement:



Pic 21

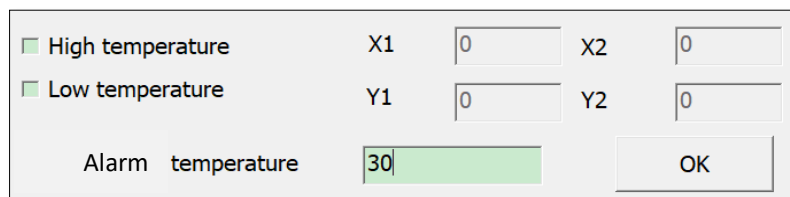
1. Single point temperature measurement

Select "Single point" and set alarm temperature as 300, input the X,Y coordinates of point 1, then point 1's temperature will show up in the display.

2. Region temperature measurement

Select "region" and set alarm temperature as 30, tick "High temperature" or "Low temperature" or both, input coordinates of point 1 (X1,Y1 that is the upper left corner of the measuring region) and point 2 (X2,Y2 that is lower right corner of the measuring region). X axis of point 1 and point 2 forms the region, in which AH stands for highest point temperature of the region, while AL stands for lowest one.

Note: upper left corner is the original point of the measuring region, X value range: 0~640, Y value range: 0~480.



The screenshot shows a settings dialog box for region temperature measurement. It contains two checkboxes: "High temperature" and "Low temperature", both of which are currently unchecked. Below these are four input fields for coordinates: X1, X2, Y1, and Y2, each containing the value "0". At the bottom left, there is a label "Alarm temperature" followed by a green input field containing the value "30". To the right of this field is an "OK" button.

Pic 22

3. Full screen temperature measurement

Select "Global" and set alarm temperature as 30, tick both "High temperature" and "Low temperature" and press "OK", then H (highest point temperature), L (lowest point temperature) and C (center point temperature of the display) will show up.

"Single point + Global": settings are same with single point temperature measurement.

"Region + Global": settings are same with region temperature measurement.

Alarm temperature setting is corrected to two decimal places and press "OK" to complete the setting.

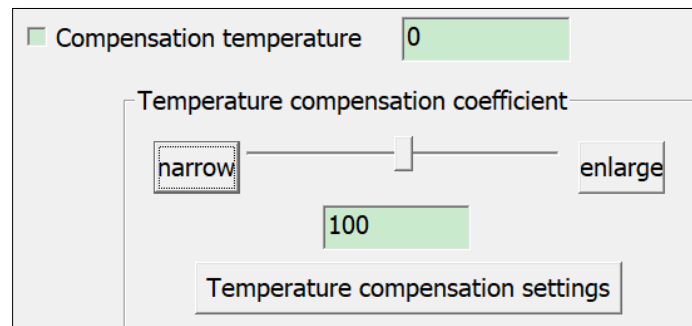
3.7.2 Compensation temperature setting

User could manually set the compensation temperature when difference comes up between actual temperature values and those displayed on screen. Tick "Compensation temperature" and input value in the corresponding field, and then

click "OK".

Temperature compensation coefficient: the unit value of compensation, for example, if the coefficient is 1, then each time user modify the temperature value compensated is either 1 or -1.

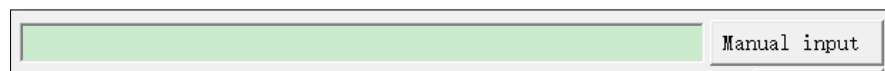
After all the settings are done, then click "Temperature compensation settings" to save all the changes made and "Save OK" will show up in the display.



Pic 23

3.8 Command sending and receiving

As shown in Pic 24, user could manually input serial port commands and press "manual input".



Pic 24

As shown in Pic 6, tick "Open reception" for no limit on receiving command values. Upper window is for sending commands, lower window is for receiving commands, user could set time interval of commands receiving as well as whether or not display the receiving time.