DWIN Technology DWIN Web Camera Screen

User Guide

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DWIN Web Camera Screen Development Guide

DWIN Technology

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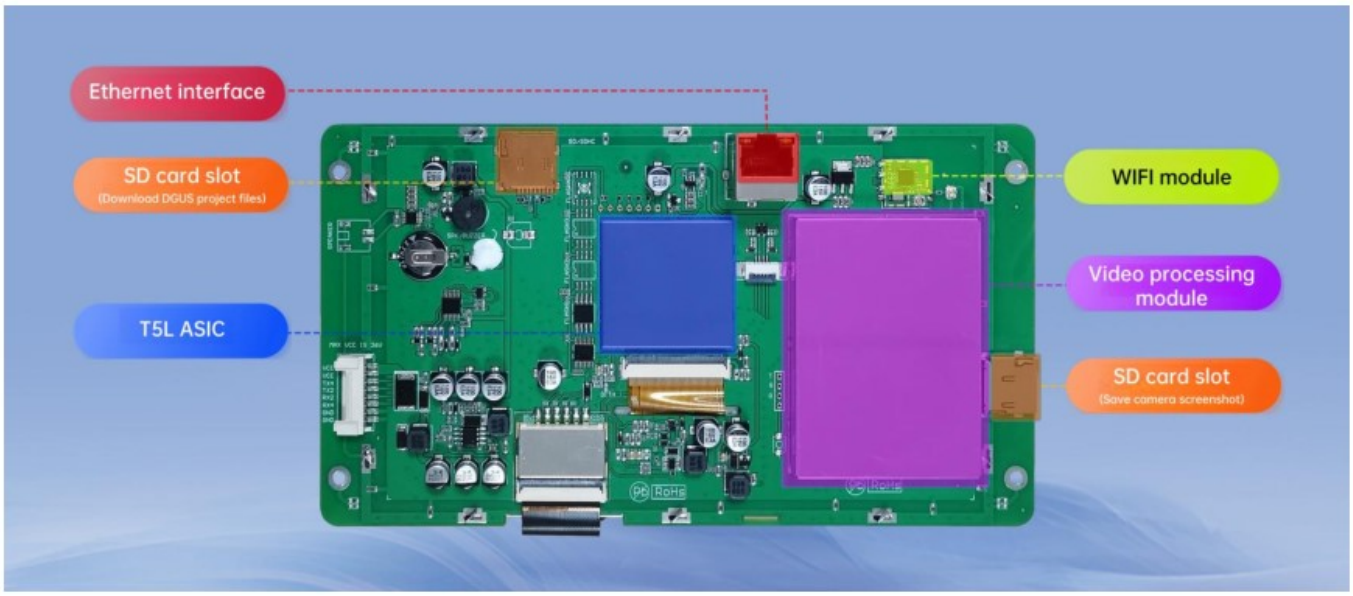
1. Product Overview

1.1 Application Introduction

The Dwin DT-series web camera screen incorporates a T5L ASIC as the core control chip, complemented by a video decoding module as a coprocessor. This architecture allows for highly efficient decoding and processing of video signals. Being compatible with high-definition web cameras, the DT series is ideal for HD display applications in diverse industries.



Hardware interface diagram

1.2 Product Features

(1) Supports connection to web cameras via Ethernet or Wi-Fi (both 2.4G and 5G bands are available).

(2) Supports web cameras with H.264 encoding under the RTSP protocol.

(3) Supports functions such as full-screen display, picture-in-picture, mirror flip, floating icons, and floating text.

(4) Supports capturing and saving camera screenshots and recording video in MP4 format.

(5) Some models support four channel cameras simultaneous display on the screen.

2. Product Selection

2.1 Dual-channel web camera screen selection table

Model	Size	Resolution	LCD Type	Touch Type	Color	Network Type	Operating Temperature (℃)
DT322X220034 Z240202A	7.0	1024*600	IPS	Resistive touch	24 bit,16.7M	WIFI	-20~70
DT322X220034 Z240202B	7.0	1024*600	IPS	Resistive touch	24 bit,16.7M	Ethernet	-20~70
DT322X220034 Z240202C	7.0	1024*600	IPS	Resistive touch	24 bit,16.7M	WIFI+ Ethernet	-20~70
DT322X220034 Z240202D	7.0	1024*600	IPS	No touch	24 bit,16.7M	WIFI	-20~70
DT322X220034 Z240202E	7.0	1024*600	IPS	No touch	24 bit,16.7M	Ethernet	-20~70
DT322X220034 Z240202F	7.0	1024*600	IPS	No touch	24 bit,16.7M	WIFI+ Ethernet	-20~70
DT322X220034 Z240202G	7.0	1024*600	IPS	Capacitive touch	24 bit,16.7M	WIFI	-20~70
DT322X220034 Z240202H	7.0	1024*600	IPS	Capacitive touch	24 bit,16.7M	Ethernet	-20~70
DT322X220034 Z240202I	7.0	1024*600	IPS	Capacitive touch	24 bit,16.7M	WIFI+ Ethernet	-20~70

Note: Operating voltage is 12~36V.

2.2 Four-channel web camera screen selection table

Model	Size	Resolution	LCD Type	Touch Type	Color	Network Type	Operating Temperature (℃)
DT322X220034 Z240902A	10.1	1024*600	IPS	Capacitive touch	24 bit,16.7M	Ethernet*4	-20~70
DT322X220034 Z240902B	10.1	1024*600	IPS	Resistive Touch	24 bit,16.7M	Ethernet*4	-20~70

Note: Operating voltage is 9 – 36V. Come with enclosure, and the camera is directly connected to the screen via the Ethernet interface.

3. System Variable Interface Description

Web camera screen can be controlled through the system variable interface (0x0500~0x05BF) reserved by the DGUS system.

3.1 System Variable Interface Definition

The functions corresponding to the addresses of various system variables used by the web camera are shown in the table below.

Variable space first address	Definition	Length (word)	Description
0x0500	camera_resolution	3	D5:4: 0x5AA5, start configuration. Clear it to zero after execution. D3:2: Represents the resolution in the X direction. D1:0: Represents the resolution in the Y direction.
0x0503	camera_mirror	1	D1: 0x5A, set the image. Clear it to zero after execution. D0: 0=not mirrored, 1=mirrored. (Not supported yet)
0x0504	camera_rotate	1	D1: 0x5A, start configuration. Clear it to zero after execution. D0: Rotation angle, 0=0 °, 1=90 °, 2=180 °, 3=270 °. (Not supported yet)
0x0505	camera_set	1	D1: 0x5A, start configuration. Clear it to zero after execution. D0: Bit7-4, reserved; Bit3-0, corresponding to camera 4-1. 1 = on, 0 = off.
0x0506	camera_screenshot	1	Screenshot function is not available yet.
0x0507	picture_test	1	0x5A00: Display pictures in the "PICTURE" folder of the SD card. This is for DWIN's internal testing.
0x0508	get_R11_info	1	D1: 0x5A, start query. D0: 0x00, query Ethernet status; 0x01, query WIFI status; 0x02, query SD card status.
0x0509	screen_ip_config	1	D1: 0x5A, startup configuration (reads the 16 byte content configured in 0x1A0), the default value for all four cameras when powered on is "192.168.1.237", and the two channels are dynamically allocated by the router and cannot be modified. D0: 0x00
0x050A	RJ45_test	1	D1: 0x5A Start a network port test D0: Bit7-4: reserved. Bit3-0: Four different network ports, 1=test, 0=no test, only one network port can be tested at once; Return 1 = normal, 0 = abnormal. Dual camera models can also be tested.

0x050B	reserved	5	Undefined
0x0510	camera1_type	1	D1: Camera 1 Type: 0 = Hikvision, 1 = Dahua, 2 = Xiongmai, 0xFF=Customized. D0: Main and auxiliary channel selection: 0=main channel, other=auxiliary channel. The dual camera model uses Camera 1 and Camera 2 by default.
0x0511	camera1_ip_vp	1	VP of IP address for camera 1. The content in VP is a string, for example: "192.168.1.150".
0x0512	camera1_username_vp	1	VP of username for camera 1. The content in VP is a string, for example: "admin".
0x0513	camera1_password_vp	1	VP of password for camera 1. The content in VP is a string, for example: "dwin123456".
0x0514	camera1_custom_vp	1	VP of customize RTSP link for camera 1. The content in VP is a string, for example: "rtsp://192.168.10.166:8554/test.264".
0x0515	camera1_channel	1	Not available yet
0x0516	camera1_reserved	2	Reserved for future expansion.
0x518	camera2_type	1	D1: Camera 2 Type: 0=Hikvision, 1=Dahua, 2=Xiongmai, 0xFF=Customized. D0: Main and auxiliary channel selection: 0=main channel, other=auxiliary channel.
0x519	camera2_ip_vp	1	VP of IP address for camera 2. The content in VP is a string, for example: "192.168.1.150".
0x51A	camera2_username_vp	1	VP of user name for camera 2. The content in VP is a string, for example: "admin".
0x51B	camera2_password_vp	1	VP of password for camera 2. The content in VP is a string, for example: "dwin123456".
0x51C	camera2_custom_vp	1	VP of customize RTSP link for camera 2. The content in VP is a string, for example: "rtsp://192.168.10.166:8554/test.264".
0x51D	camera2_reserved	3	Reserved
0x520	camera3_type	1	D1: Camera 3 Type: 0 = Hikvision, 1 = Dahua, 2 = Xiongmai, 0xFF = Customized. D0: Main and auxiliary channel selection: 0 = main channel, other=auxiliary channel.
0x521	camera3_ip_vp	1	VP of IP address for camera 3. The content in VP is a string, for example: "192.168.1.150".
0x522	camera3_username_vp	1	VP of user name for camera 3. The content in VP is a string, for example: "admin".

0x523	camera3_password_vp	1	VP of password for camera 3. The content in VP is a string, for example: "dwin123456".
0x524	camera3_custom_vp	1	VP of customize RTSP link for camera 3. The content in VP is a string, for example: "rtsp://192.168.10.166:8554/test.264".
0x525	camera3_reserved	3	Reserved
0x528	camera4_type	1	D1: Camera 3 Type: 0=Hikvision, 1=Dahua, 2=Xiongmai, 0xFF=Customized. D0: Main and auxiliary channel selection: 0=main channel, other=auxiliary channel.
0x529	camera4_ip_vp	1	VP of IP address for camera 3. The content in VP is a string, for example: "192.168.1.150".
0x52A	camera4_username_vp	1	VP of username for camera 3. The content in VP is a string, for example: "admin".
0x52B	camera4_password_vp	1	VP of password for camera 3. The content in VP is a string, for example: "dwin123456".
0x52C	camera4_custom_vp	1	VP of customize RTSP link for camera 3. The content in VP is a string, for example: "rtsp://192.168.10.166:8554/test.264".
0x52D	camera4_reserved	3	Reserved
0x0530-0x053F	camera_driver_info	16	Mapping location of camera driver memory. 530-539: Mapping of data regions used for external interrupt 0 and 1. 53A: Second count. 53B: The high/low bytes represent the ping status of network ports of Channel 1/2 respectively. 1=successful ping, 0=failed ping. 53C: The high/low bytes represent the ping status of network ports of Channel 3/4 respectively. 1=successful ping, 0=failed ping. 53D: High byte LAN status, low byte WLAN status. 53E: High byte represents the status of the SD card. Low byte, bits 3-0, represent the status of cameras 1-4. 1 = on, 0 = off. 53F: Detection result of the USB device. 0 = not detected, 1 = detected.
0x0540-0x054F	camera1_display_size	16	Data Transmit control. Its size is the same as the of camera 1 control.
0x0550-0x055F	camera2_display_size	16	Data Transmit control. Its size is the same as the of camera 2 control.
0x0560-0x056F	camera3_display_size	16	Data Transmit control. Its size is the same as the of camera 3 control.

0x0570-0x057F	camera4_display_size	16	Data Transmit control. Its size is the same as the of camera 4 control.
0x0580-0x058F	camera1_display_sp	16	Icon Overlay, SP of the display control for camera 1. VP: FF00.
0x0590-0x059F	camera2_display_sp	16	Icon Overlay, SP of the display control for camera 2. VP: FF00.
0x05A0-0x05AF	camera3_display_sp	16	Icon Overlay, SP of the display control for camera 3. VP: FF00.
0x05B0-0x05BF	camera4_display_sp	16	Icon Overlay, SP of the display control for camera 4. VP: FF00.

Note: To view saved pictures, it is necessary to close all cameras. Network cameras only require configurations associated with camera 1 and camera 2.

3.2 Application Instance

For example, adjusting the resolution through the system variable interface 0x0500 can be achieved by sending commands through the serial port or using DGUS “Return Key Code” control.

(1). Serial port command.

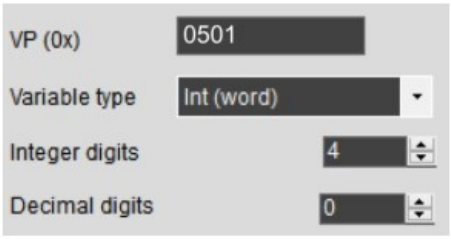
82/83 command: 5AA5 09 82 0500 5AA5 0320 01E0

Command meaning: Frame header Command length 82 (write variable space) System variable address Start resolution processing once Resolution in X and Y direction

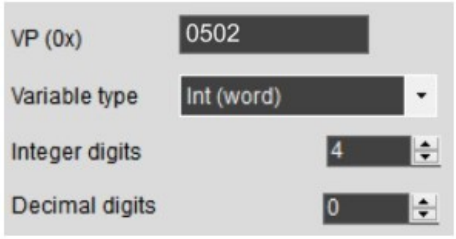
Note: After the serial port command is issued, the camera screen will be adjusted to 800 * 480.

(2). DGUS control

1.The resolution in the X and Y directions can be modified through the "Variables Input" control, and the parameter settings refer to the following figure.

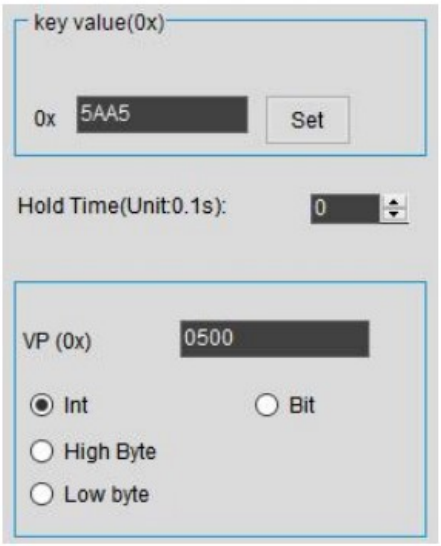


X-direction resolution input



Y-direction resolution input

2. Making the resolution effective can be achieved through the "Return Key Code" control. Parameter settings are shown in the following figure.



4. Camera Interface DGUS Development

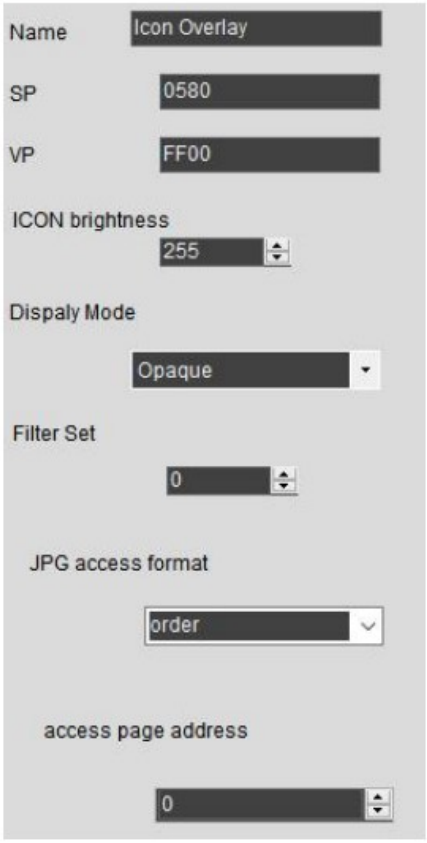
4.1 Camera control settings

The DGUS project for simulating camera interface requires the use of two controls: "Data transmit" and "Icon Overlay".

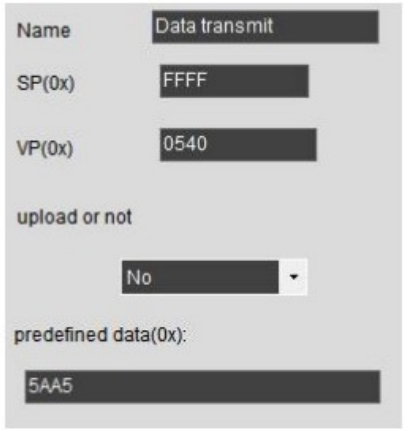
Taking camera 1 setting as an example, Overlay and place 

and 

together, and refer to the following content to set the control parameters. The predefined data "5AA5" in “Data transmit” control means that the camera will automatically open upon entering the page, while the rest of the values are not automatically turned on. Ensure that the display area size of the two controls should be identical.



Icon overlay



Data transmit

4.2 Dynamic adjustment of camera control attributes

Take Camera 1 as an example. The pointer address is 0x0580 (for other cameras, please refer to “3.1 System Variable Interface Definition”). You can dynamically adjust the parameters of the camera control by modifying the content of the corresponding Variable Pointer (VP) address, as detailed in the table below.

Note that before adjusting the camera control attributes, you must turn off the camera!

VP Address Offset	Definition	Length (Byte)	Description
0x00	*VP	2	Used by the camera driver; modification is prohibited.
0x01	(x, y)	4	The coordinates of the camera image (top left corner) displayed on the current page.
0x03	Wide_X	2	The width of the camera image in pixels.
0x04	Wide_Y	2	The height of the camera image in pixels.
0x05:H	Dim_Set	1	Brightness, from 0x00 (dimmest) to 0xFF (brightest).
0x05:L	Disp_Mode	1	Display mode: 0x00 = JPEG icon displayed transparently (icon background not shown); Others = JPEG icon background displayed.
0x06:H	Filter_Set	1	When the displayed JPEG icon is set to the transparent mode, the background color filtering intensity ranges from 0x01 to 0x3F.
0x06:L	*VP_Page	1	Used by the camera driver, modification is prohibited.

*Note that if you accidentally modify the data in the VP address that is prohibited, you can restore normal operation by restarting the screen.

5. Instructions for Using Web Camera

5.1 View camera IP address

(1) Before obtaining the camera IP, please confirm that the local area network is available. You can verify this by using the ‘ping’ command in the Windows command prompt: win+R, open “Run” enter “cmd” and press enter → enter ‘ping 192.168.1.1’. A successful result, as shown in Figure 5.1, indicates that your local network is working correctly.

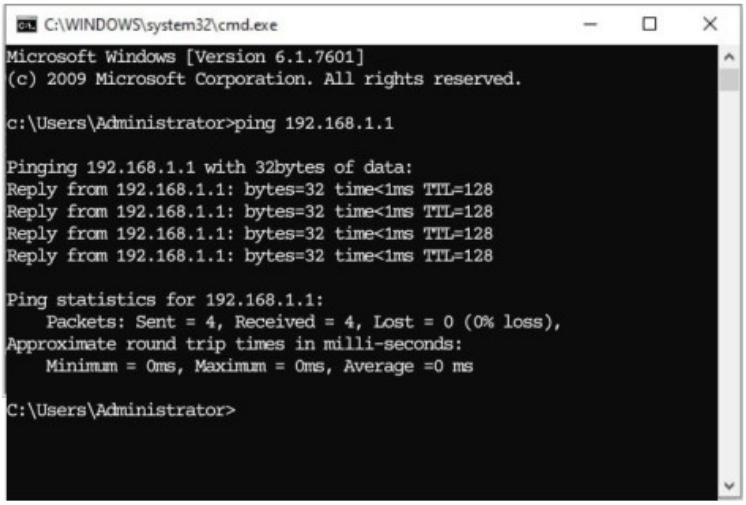


Figure 5.1

(2) As shown in Figure 5.2, for a wired connection, please connect the PC, web camera, and screen to the same LAN through a router. WLAN connection can refer to Part 6 of this guide, “3. How to connect to the WIFI network?”. If the web camera is used for the first time, please register and activate it as instructed by the supplier.

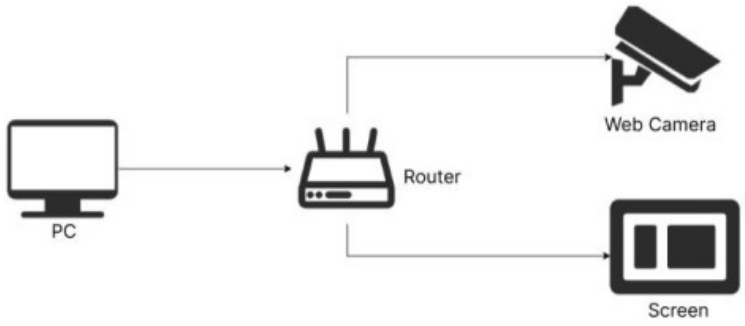


Figure 5.2

(3) Power the web camera and screen and view the camera IP information through software on the PC. Through the supplier’s supporting software to view the IP address of the camera, such as Hikvision’s SADP, Dahua’s Config Tool and SmartPSS Plus.

Taking Hikvision as an example, the camera IP can be viewed through SADP software (you can find the download webpage by searching for “SADP” on browser).

Open the SADP software and click the “Refresh” button in the upper right corner to view the IP address of the online device (Figure 5.3). If the device cannot be found, please first check if the IP is available. If using WLAN connection, please confirm that the network bandwidth is 2.4G.

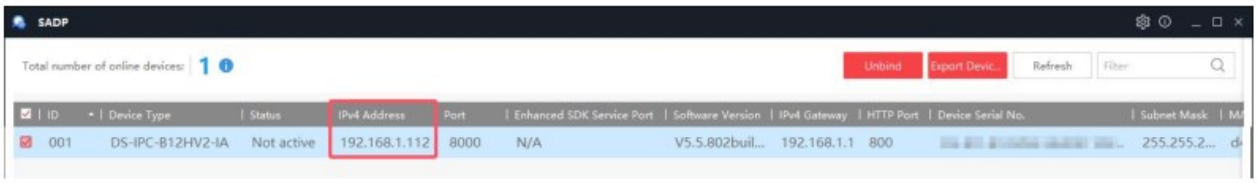


Figure 5.3

Four – channel camera models, this step can be skipped as the screen will automatically configure the IP. You can also manually modify the RTSP address link, ensuring that it is on the same local area network as the screen's IP (192.168.1.***).

5.2 Screen 22 File Configuration

The "22 file" on the network camera screen is configured through the system interface to enable automatic loading of the camera's IP address, username, password, and custom URLs upon power-on. The camera image won't display without configuration. The VP addresses associated with the 0x510-0x52F interface are userconfigurable but require a reserved length of 0xFF. This address range is strictly reserved and should not be utilized.

Table 5-1 Camera Configuration

Camera Number	Functional Interface	Initialization Information VP Address
Camera 1	0x0510-0x0517	Customized, with the length of 0xFF
Camera 2	0x0518-0x051F	Customized, with the length of 0xFF
Camera 3	0x0520-0x0527	Customized, with the length of 0xFF
Camera 4	0x0528-0x052F	Customized, with the length of 0xFF

Taking Camera 1 (the 22 file address is A20-A2F) as an example, refer to the following configuration of the 22 file:

0xA20: Camera type (Hikvision in Figure 5.4)

0xA21: Main stream and sub-stream selection

0xA22-0xA23: The starting VP address where the camera IP is stored. The example routine writes 0x1800, see 0x3000 in Figure 5.4.

0xA24-0xA25: The starting VP address where the camera username is stored. The example routine writes 0x1810, see 0x3020 in Figure 5.4.

0xA26-0xA27: The starting VP address where the camera password is stored. The example routine writes 0x1820, see 0x3040 in Figure 5.4.

0xA28-0xA29: The starting VP address where the camera's customized RTSP address is stored. The example writes 0x1830, see 0x3060 in Figure 5.4.
0xA2A-0xA2F: Reserved and undefined.

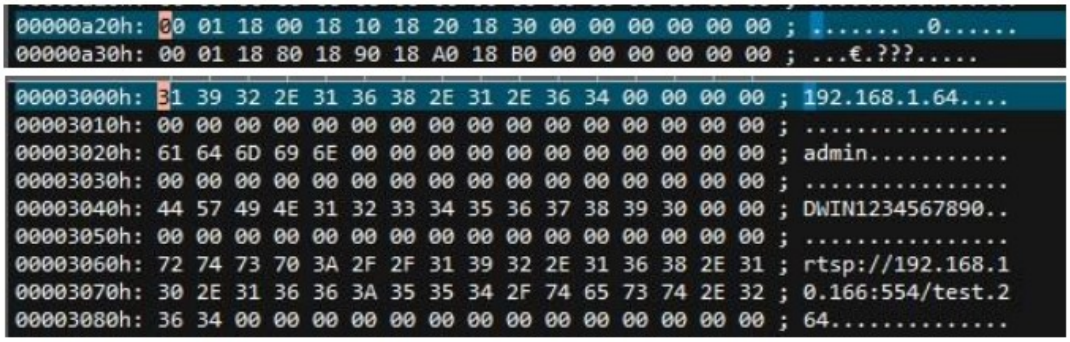


Figure 5.4

Note: For the parameters with the green background marked above, users should fill in according to the actual situation of their own cameras when configuring, and must not fill in by referring to the data in the figure!

5.3 Camera Setting

Taking the Hikvision camera as an example, this section describes how to configure the camera.

(1) Connect the camera, computer, and router, and then log in to the camera by entering the camera's IP address in the browser to perform settings. The camera needs to be activated for the first login. The default username is "admin", and the password needs to be set by yourself. Note that the "@" symbol should not be included in the password, otherwise the screen will not be able to connect to the camera!

Figure 5.5

(2) Main stream settings
As shown in Figure 5.6, after logging in, click on "Audio/Video" to configure the following

items. Click “Save” after completion.

Video Type: Video Stream.

Resolution: 720P and below.

Video Encoding: H.264.

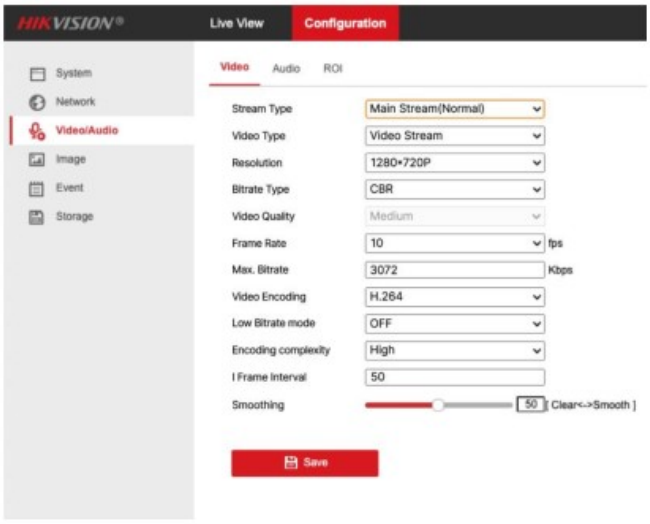


Figure 5.6

(3) Sub-stream settings

The sub-stream is set with reference to the content in Figure 5.7. Click “Save” after completion.

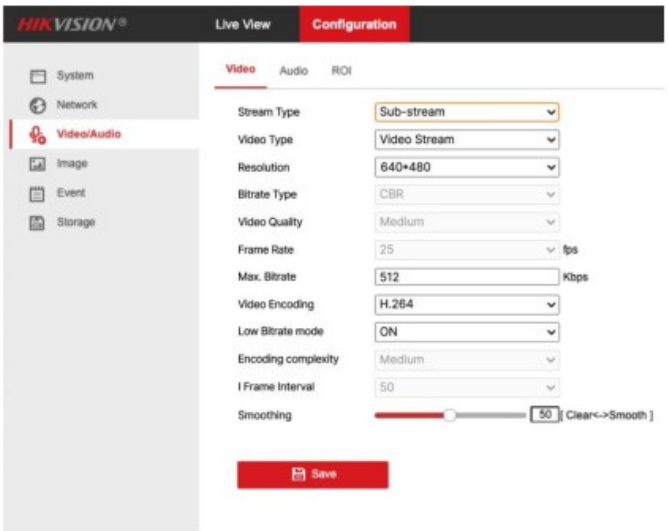


Figure 5.7

(4) The configuration of Dahua cameras can refer to Figure 5.8.

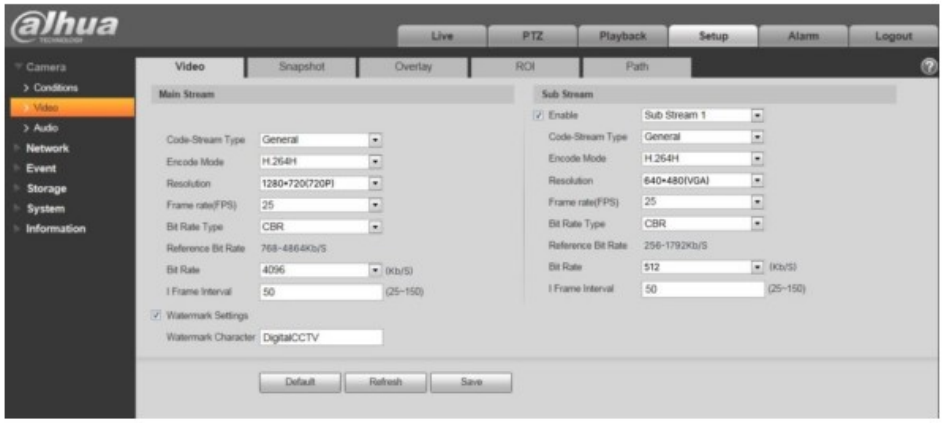


Figure 5.8

(5) Dual-channel/Four-channel simultaneous display settings

It is recommended to turn off the audio input to avoid issues with the camera image display..

5.4 Camera Image Display

Download the configured 22 file to the screen via the SD card, connect the camera, screen, and router. After the system is powered on and you hear a “beep” from the screen, click the camera icon on the main page to enter the camera display page. Click “ON” to display the image captured by the network camera (as shown in Figure 5.9).

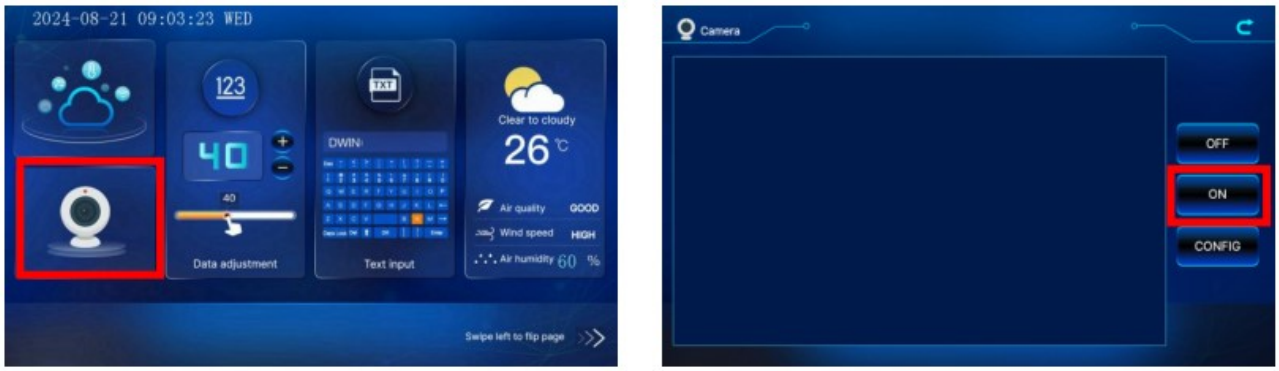


Figure 5.9

5.5 Camera Custom Link

The camera type can be manually clicked to select. When “Custom” is selected, the screen will use the camera corresponding to the custom link.

Figure 5.10

6. Common Questions

1. Unable to display camera screen after connecting to router?

Check if the network cable connection is correct and be careful not to use the WAN interface (the interface shown in the red box in the figure below can be used). Note that the four-channel network camera screen does not need a router.

2. Is it possible to use the web camera without a router?

Yes, you can connect the web camera directly to the screen. However, in this case, you need to download special single-channel display firmware.

3. How to connect to the WIFI network?

Method 1: Use Notepad to open the “wpa_supplicant. conf” file on the USB disk, fill in your written WIFI name (SSID) and password in the following format, save the file, and make sure to place it in the root directory of the USB disk. After the screen is powered on, the file parameters will be automatically read and WIFI configuration will be performed.


```
ctrl_interface=/etc/wifi/sockets
disable_scan_offload=1
update_config=1
network={
  ssid="WIFI name"
  psk="WIFI password"
}
```

4. The project settings and the parameter are correct, but the camera image cannot be displayed?

When using the web camera, you need to ensure that the screen and the web camera are on the same local area network, otherwise the image may not be displayed. You can follow the steps below to confirm whether the network segments of the camera and the screen are the same:

(1) As shown in the red box in Figure 1, use a serial port adapter to connect the Tx, Rx, and GND serial ports near the functional module, so that the screen can communicate with the computer.

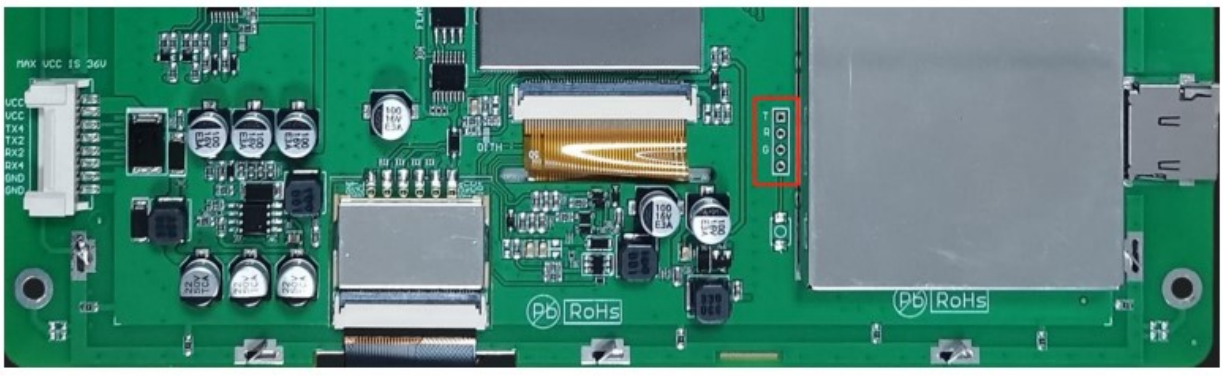


Figure 1

(2) Screen connection to the local area network

For wired connection, directly connect the screen and the router with network cable. For wireless connection, please refer to “3. How to connect to the WIFI network?”.

(3) Querying the screen's IP address

Open the serial port tool MobaXterm, select the correct serial port number as shown in Figure 2, and set the baud rate to 921600. After configuration, click OK, press "Enter", and the screen shown in Figure 3 will be displayed.

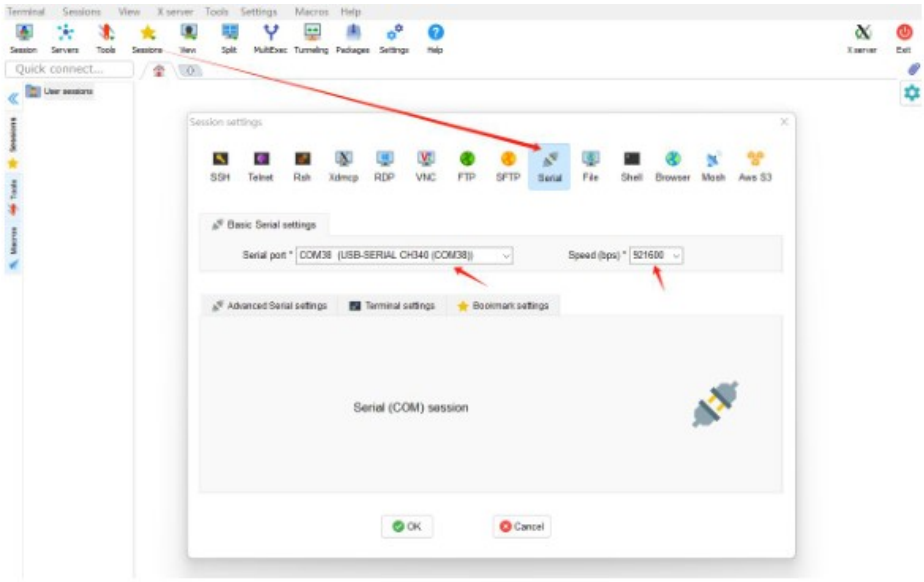


Figure 2

Figure 3

(4) Type "ifconfig -a" and press "Enter" to view the device's IP. Among them, eth0 is for wired connection, and wlan0 is for wireless connection. The presence of "inet addr" indicates that the network connection is normal.

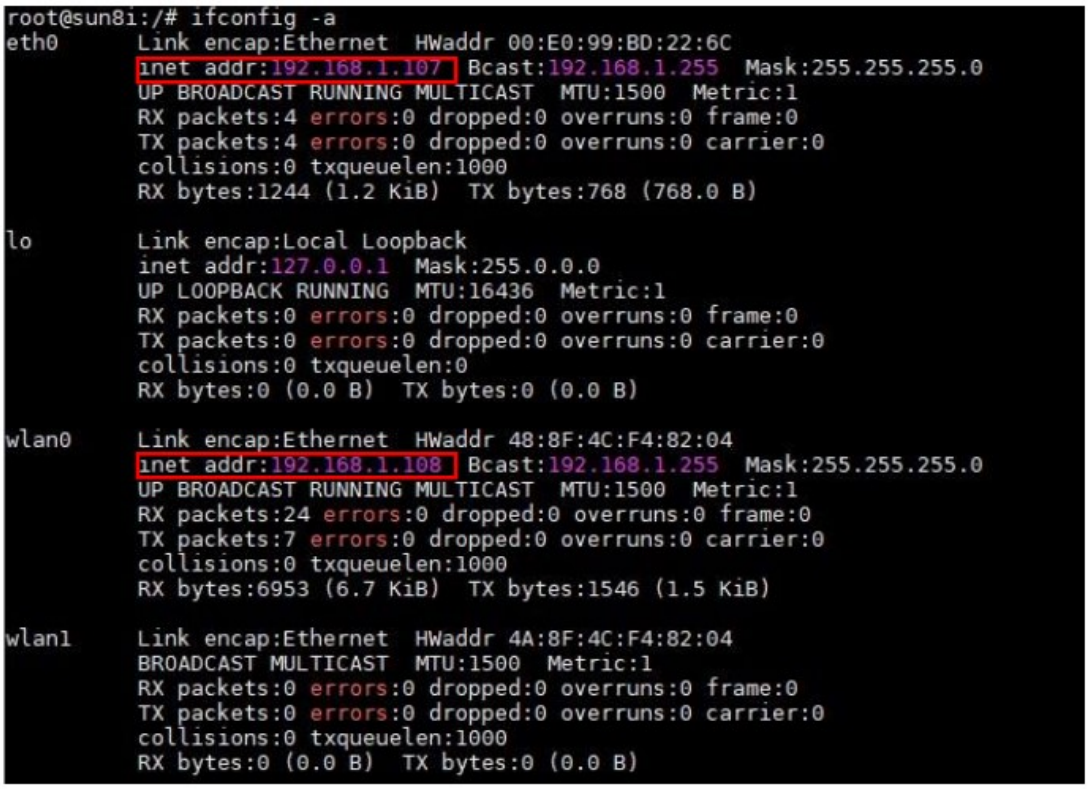


Figure 4

(5) Confirm the camera's IP and whether the screen and the camera are on the same network. Enter the command "ping 192.168.1.64" and press "Enter". The pink-colored part in the displayed content is the camera's IP. As shown in Figure 5, it indicates that the connection with the camera is successful. To exit the ping operation, just press Ctrl + C.

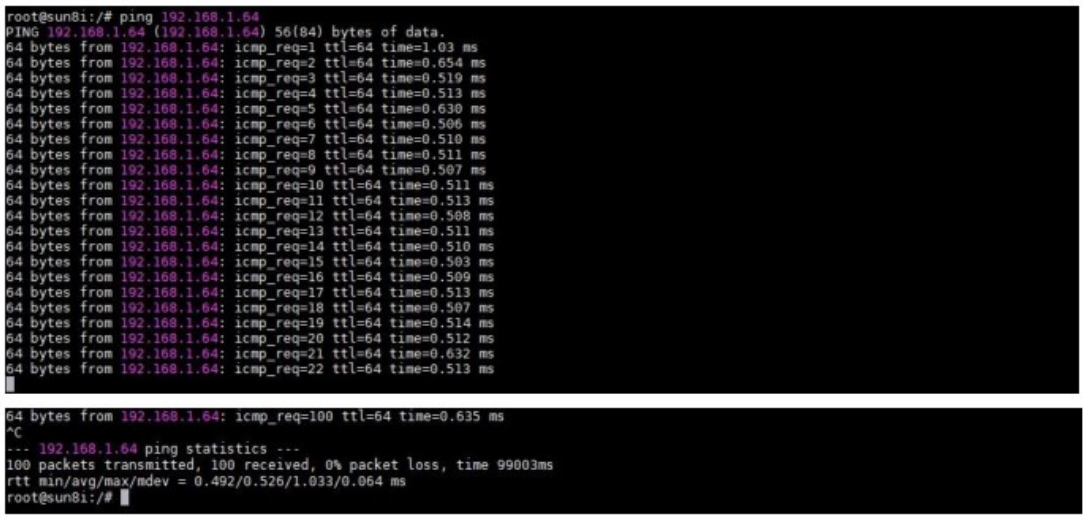


Figure 5

7. Revision Records

Version	Revise Date	Content	Editor
1.0	2024-08-08	First Edition	Xu Ying
1.1	2025-01-21	Updated instructions on camera configuration	Xu Ying
1.5	2025-5-27	Updated camera configuration descriptions	Joyce Jiang

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Documents / Resources

	DWIN Technology DWIN Web Camera Screen [pdf] User Guide DMT80600C080_01W, DMT80600C080 DWIN Web Camera Screen, DMT80600C080, DWIN Web Camera Screen, Web Camera Screen, Camera Screen

References

- User Manual

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Camera Screen, DMT80600C080, DMT80600C080 DWIN Web Camera Screen, DMT80600C080_01W, DWIN Technology, DWIN Web Camera Screen, Web Camera Screen

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