

AVer Pro-AV Quick Start Guide to Camera Control using Visca over IP (UDP)

January 2024

Steps to verify the AVer PTZ3xxV1/V2, PTZ2xx, TR530+/TR530/320 and TR3xxV1/V2 cameras to be controlled with Visca over IP command connections.

Visca over IP offers the ability to send several different control commands over a network (RJ45) connection, without the need to add additional cabling.

The AVer **CL01** Camera controller can control up to 255 separate cameras on the same subnet using the Visca over IP protocol.

AVer has high quality image Cameras (TR3xxV1/V2, TR530/TR530+, PTZ3xxV1/V2) that will integrate with these workflows for peak performance and ease of use. We will show the configuration process for these cameras using the Visca Over IP.

There are several 3rd party controllers available that integrate with the AVer Pro-AV cameras, Crestron, Extron, QSC, Altona, RTI, to name a few. In this document we will discuss how to test the basic controls via software should there be an issue where the before mentioned controllers are not working as expected.



There are some pre-requisites and additional information needed for this to happen, see below.

VISCA over IP Packets

If you are using a 3rd party controller, Crestron, Extron, QSC, Altona, etc. verify the command structure you are using is correct for BOTH the controller and the camera.

VISCA over IP commands need to be sent in full packet order:

Packet header + **VISCA command**.

Let's take **PT_Up** as an example.

The full command should be **01 00 00 09 00 00 00 01 81 01 06 01 08 08 03 01 ff**.

RED part of command is for VISCA over IP packet header.

BLUE part of command is for VISCA command.

Also, after any pan tilt movement command is sent, it needs to send **PT_Stop** command to stop movement, which should be **01 00 00 09 00 00 00 01 81 01 06 01 08 08 03 03 ff**.

***Note:** If sending a Pan_Stop command to a **PTZ310/330/N** camera running an earlier FW than 0.70, the command string will be: **01 00 00 09 00 00 00 03 81 01 06 01 08 08 03 03 FF**

For the VISCA over IP header, the 3rd & 4th bytes of the header are important.

They indicate length of payload (VISCA command).

At this point, the value could be varying depending on what VISCA command is sent.

For example:

Inquiry (listed as "info"): **01 00 00 05 00 00 00 01 81 09 00 02 FF**

Settings (listed as "framing"): **01 00 00 07 00 00 00 01 81 01 04 7D 00 00 FF**

Command (movements): **01 00 00 09 00 00 00 01 81 01 06 01 08 08 03 01 FF**

Visca over IP selection

For Visca-over-IP, (8x) the digit x following 8 must be set to 1.

Example:

Power Off command to the PTZ3xx camera.

01 00 00 06 00 00 00 00 81 01 04 00 03 FF

For RS232/422 serial connection, the digit x following 8 is the Visca ID# (Camera address 1~7)

VISCA over IP Packets (continued)

Advanced Setting

1 st Layer	2 nd Layer	3 rd Layer	4 th Layer
Advanced Setting	Audio	Input Type	Line In/Mic In
		Audio Volume	0-10
	Control	Serial Port	RS-232/RS-422
		Protocol	VISCA/PELCO D/PELCO P
		Camera Address	1-7
		Baud Rate	4800/9600/38400
	Tracking	Off/On	-
	Tracking Mode	Presenter	-
		Zone	-
		Hybrid	-

VISCA over IP

PORT

Internet protocol	IPv4
Transport protocol	UDP
Port address	52381

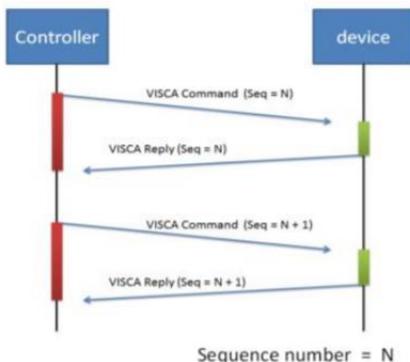
FORMAT

func	byte 0	byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte8 ~~~ byte23
data	Value1	Value2	1~16 (0x0001~0x0010)		Sequence number			0X00000000 ~ 0XFFFFFFF	
									Payload (1 to 16 bytes)
									VISCA Packet (see page VISCA)

Payload type

Name	Value1	Value2	Description
VISCA command	0x01	0x00	Stores the VISCA command.
VISCA inquiry	0x01	0x10	Stores the VISCA inquiry.
VISCA reply	0x01	0x11	Stores the reply for the VISCA command or VISCA inquiry

Sequence number



The x value of 8x should be 1 for the Visca-over-IP string.

AVer Cameras “VISCA Customized Function” settings

Some of the AVer Pro-AV cameras support a feature called “*VISCA Customized Function*”.

This is a very useful tool when wanting to customize a certain Preset# to do a specific function, like turn “Auto Tracking ON”. This makes programming easy for other devices, like when using the AVer CL01 camera controller.



You will notice there are no dedicated buttons for some commands like “*Switch Presenter, Enter Zone Mode, Tally On/Off*”, etc. So, the ability to just use a Preset# recall from the CL01 makes it easy to do those functions.

Question:

What if I also want to send control commands from another device/touch panel, would using these *Visca customized functions* change the programming?

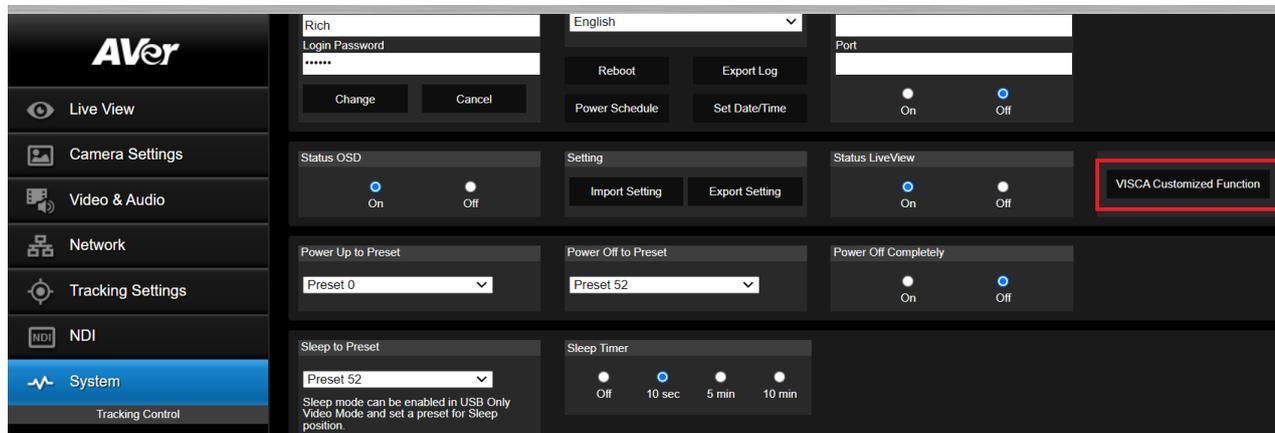
The answer is YES, it would.

If that particular function was enabled in the WebUI, it would take precedence over the original VISCA over IP command string!

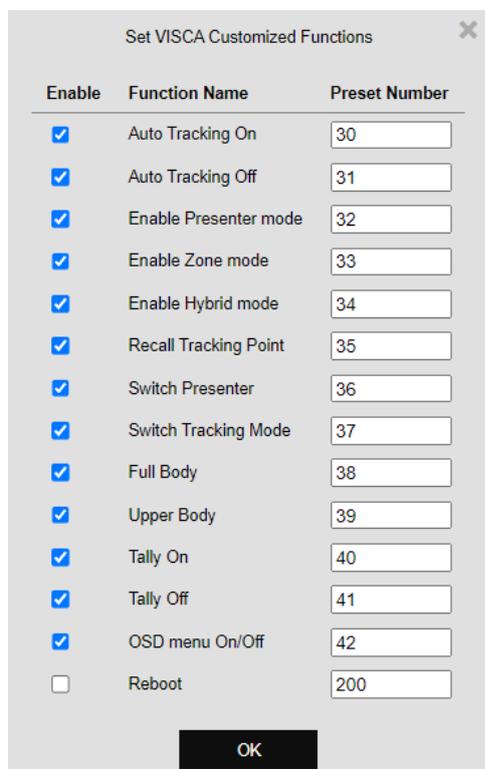
AVer Cameras “VISCA Customized Function” settings (continued)

Once the camera has been placed on the network, login to the camera by using a Chrome Browser, and type in its IP address.

Go to the “System” tab, look for the “VISCA Customized Function”.



Once selected, another window will appear, revealing the “Functions” and “Preset Numbers” associated with those functions.



If the Customized Function is Enabled, the remote control VISCA over IP command would change.

Example:

Original TR313V2 Presenter Tracking command:
 HEX: 01 00 00 07 00 00 00 00 81 01 04 3F 01 A4 FF

Since the Customized Command is ENABLED, it would NOT work.

You would need to send the Preset Recall command for Preset#32.

HEX: 01 00 00 07 00 00 00 00 81 01 04 3F 02 20 ff

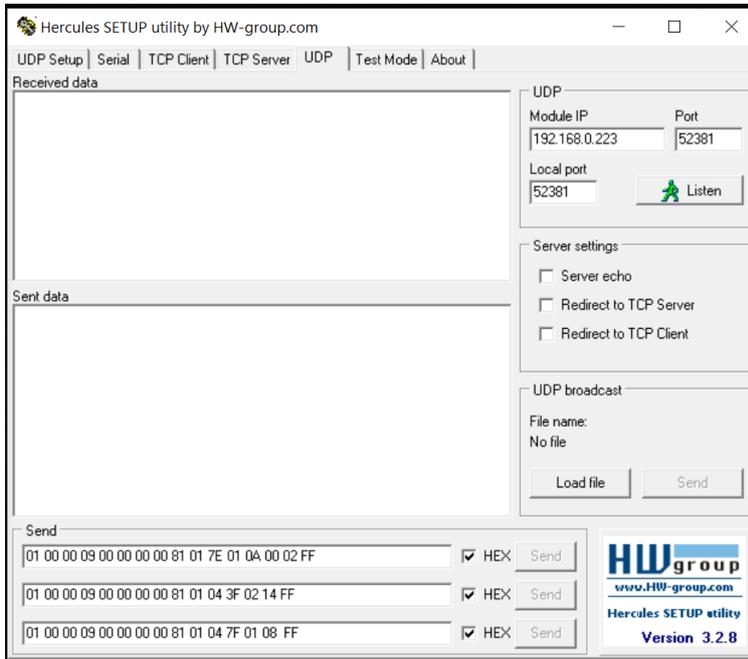
*Preset #32 in Decimal = 20 in HEX

Hercules Software

To verify “network” connectivity and control at a basic level, there is a “free” software available (Windows) for use to test the Visca over IP command strings. This is a valuable tool to “bypass” any hardware issues or programming issues from the “in-room” devices being used.

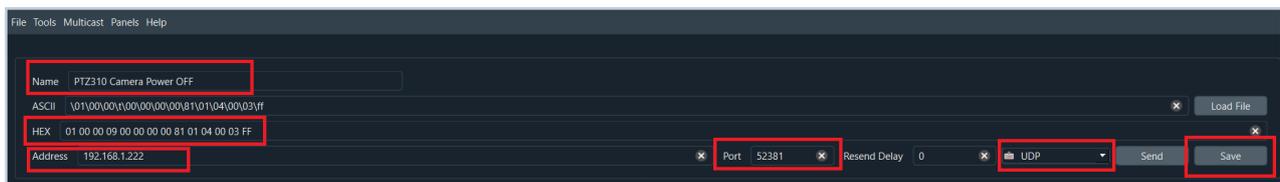
It can be found here:

<https://www.hw-group.com/software/hercules-setup-utility>



Packet Sender Software

There is another option to use “Packet Sender”, it is geared more for Visca over IP commands, you can also “Save” the command sets in ASCII and HEX for future use.



It can be found here:

<https://packetsender.com/>

Network Connection

The AVer cameras can be connected in one of several different ways, one of those is to connect the cameras via network, using a good quality Cat5E (or better) network cable to a Gigabit network switch.

*Note: Some of our cameras do support PoE+.

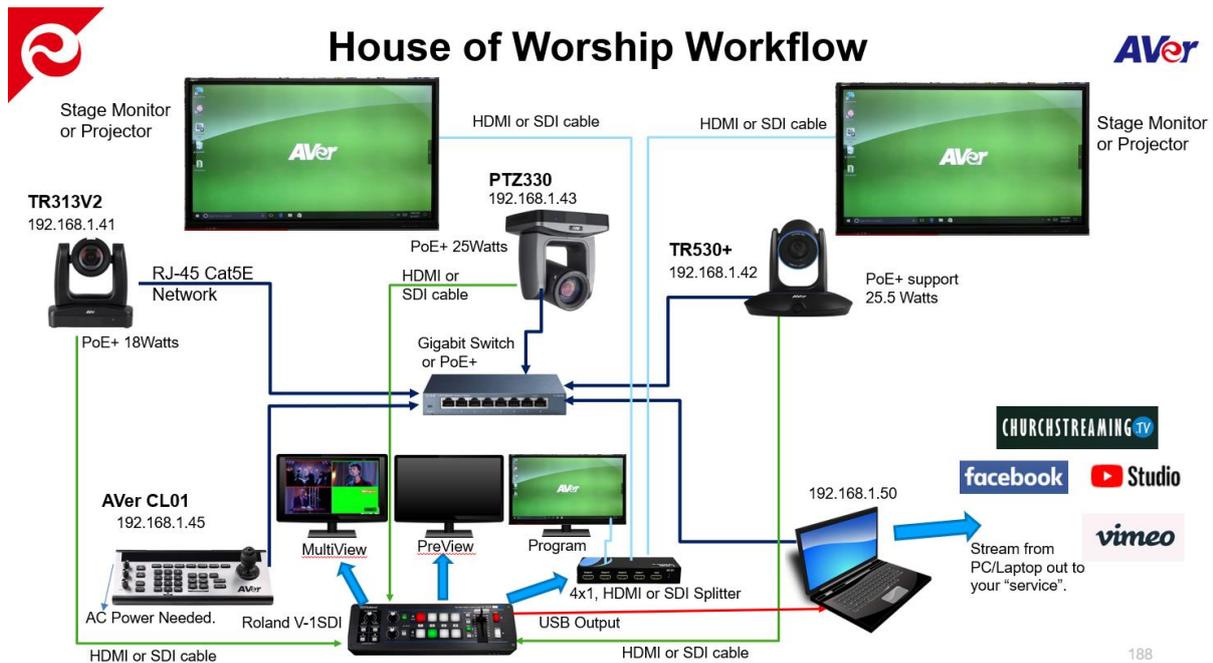
PTZ310/N/W and PTZ330/N/W require **25watts** per LAN port.

TR3xxV1 / TR3xxV2 require **18 watts** per LAN port.

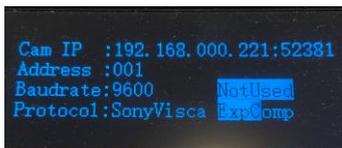
PTZ3xxUV2/UNV2 require **19 watts** per LAN port.

TR530+ requires **25.5 watts** per LAN port.

Here is a typical camera network connection diagram.



For the AVer CL01 to communicate to the cameras via Visca Over IP, set the camera Protocol to SonyVisca, selectable via the CL01 menu.



*Note: For more detailed information on the CL01 setup and configuration, refer to the CL01 Camera Controller Connection Guide or User Manual.

<https://www.averusa.com/pro-av/support/>

Network Connection (continued)

Network Ports

To check camera settings and camera control via a Chrome browser, verify the following ports are open/available.

VISCA Control port: 52381

CGI port: 80

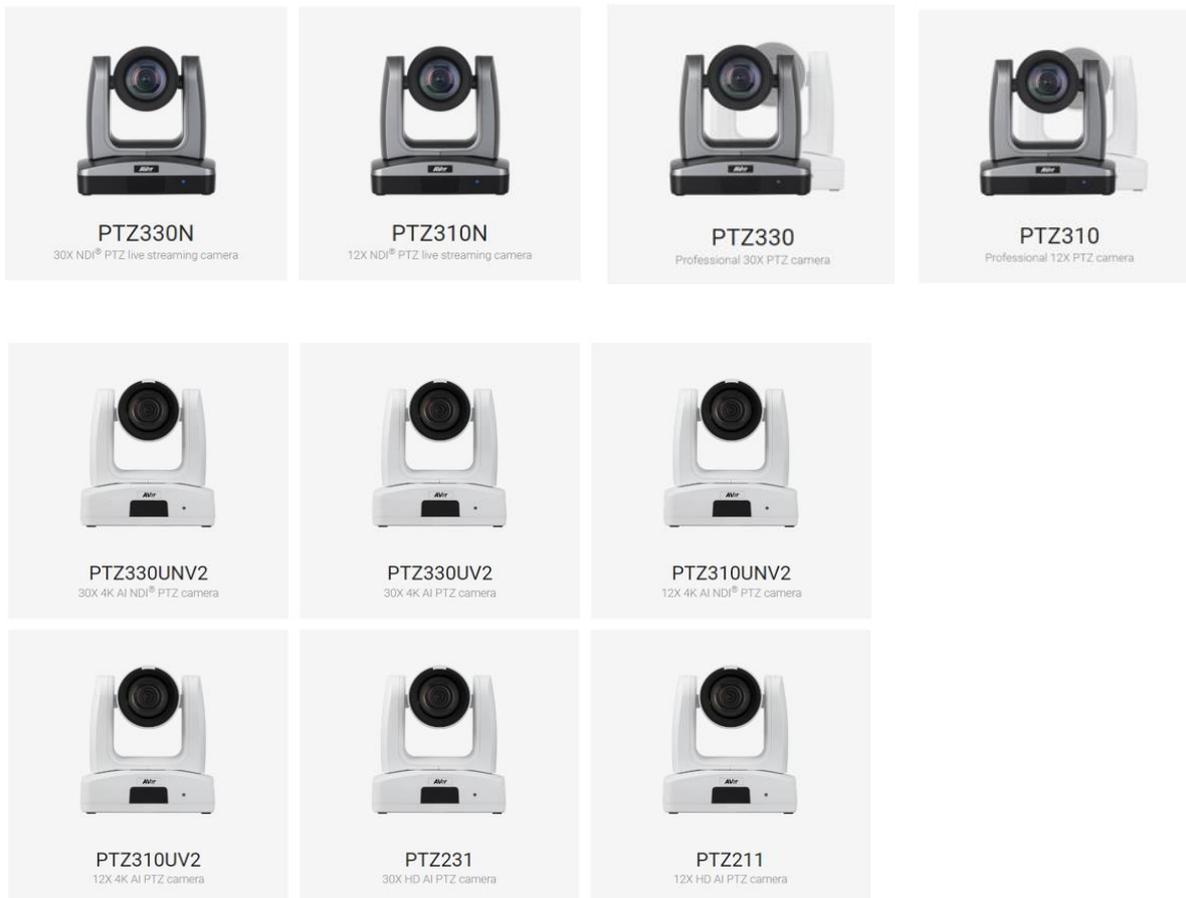
RTSP port: 554

Internet protocol: IPv4

Transport protocol: UDP

AVer PTZ3xxV1 / PTZ2xx / PTZ3xxV2 Camera Setup

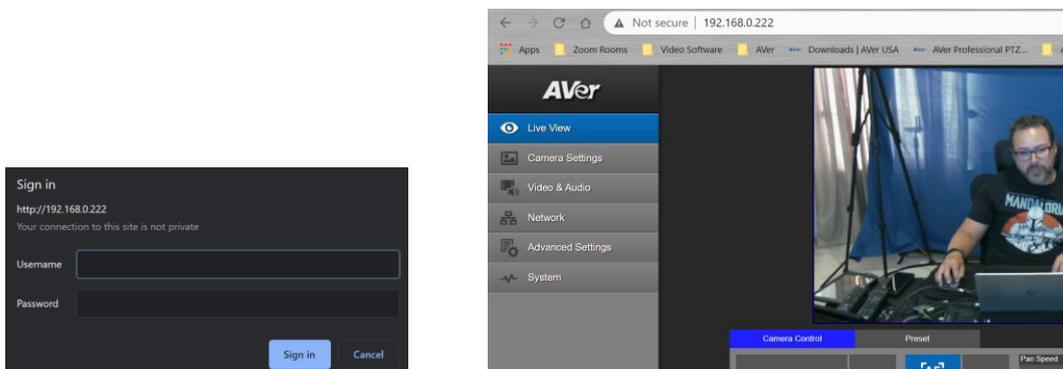
The AVer PTZ310/330(N), PTZ211/231, and PTZ3xxV2 offers exceptional optical quality up to 2160p/60 video standards, Quad Output, SDI, HDMI, NDI support, SRT Ready, SmartShoot motion tracking, and PoE+ support.



WebUI Network Connection:

1. Once all the equipment is connected, network IP's have been assigned and configured, verify you can gain access to the AVer PTZ Camera by typing in the camera IP address in a Chrome browser.

***Note:** Edge, Safari and other browsers are not supported.



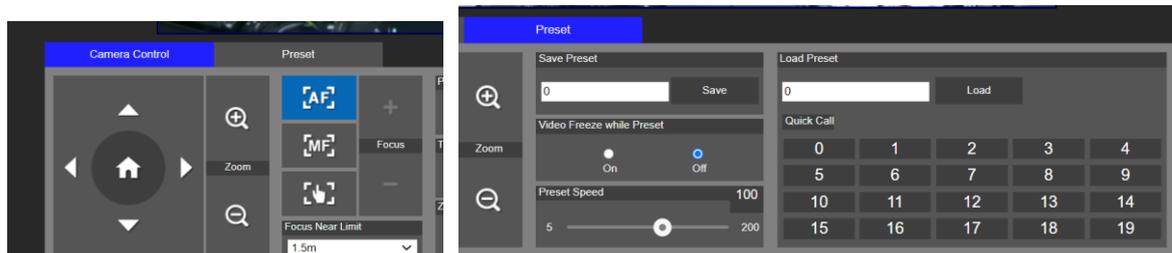
AVer PTZ3xxV1 / PTZ2xx / PTZ3xxV2 Camera Setup (continued)

WebUI Network Connection:

If this is the first time accessing the cameras WebUI, it will ask you for the default login credentials, which are: “admin” and “admin”.

It will then ask you to change the default values, PLEASE write that information down, and then login with the NEW credentials.

2. Next, verify you can control the camera via the WebUI PTZ controls and can control the Presets, Save, Load functions.



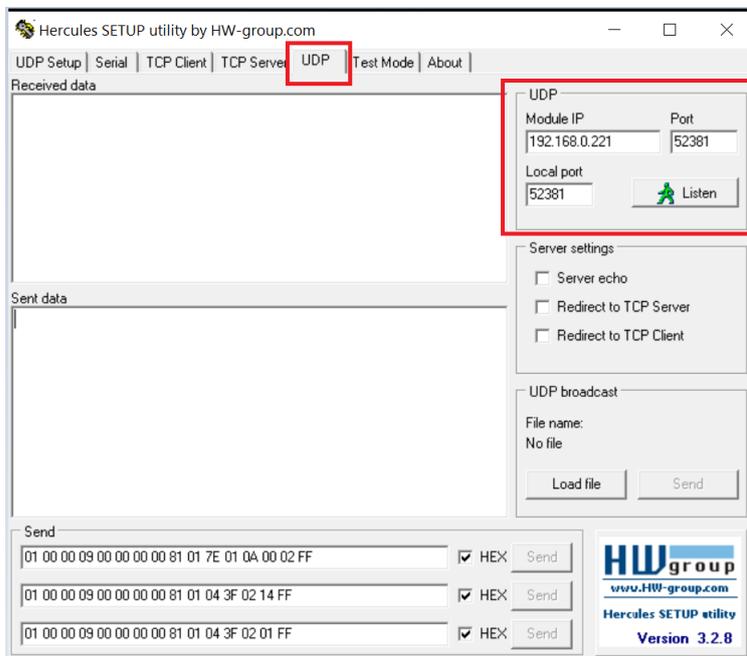
3. At this point you should have full control of the camera, ability to Save and Recall Presets, if you do NOT have control, most likely the control port has been disabled/blocked. Verify that port **52381** is open on the network.
4. Once the basic controls have been verified working from the WebUI of the camera, the next step is to verify that sending Visca over IP commands works via the Hercules software.

AVer PTZ3xxV1 / PTZ2xx / PTZ3xxV2 Camera Setup (continued)

Hercules Software Testing

In this next section we will discuss using the Hercules software in a very specific way to test the Visca over IP commands are being recognized by the AVer camera.

1. Open the Hercules software and select the UDP tab.



2. Next, enter the IP address of the camera as well as Port number 52381.
3. Next, select “Listen”, you should see a green message appear, “UDP socket created”.



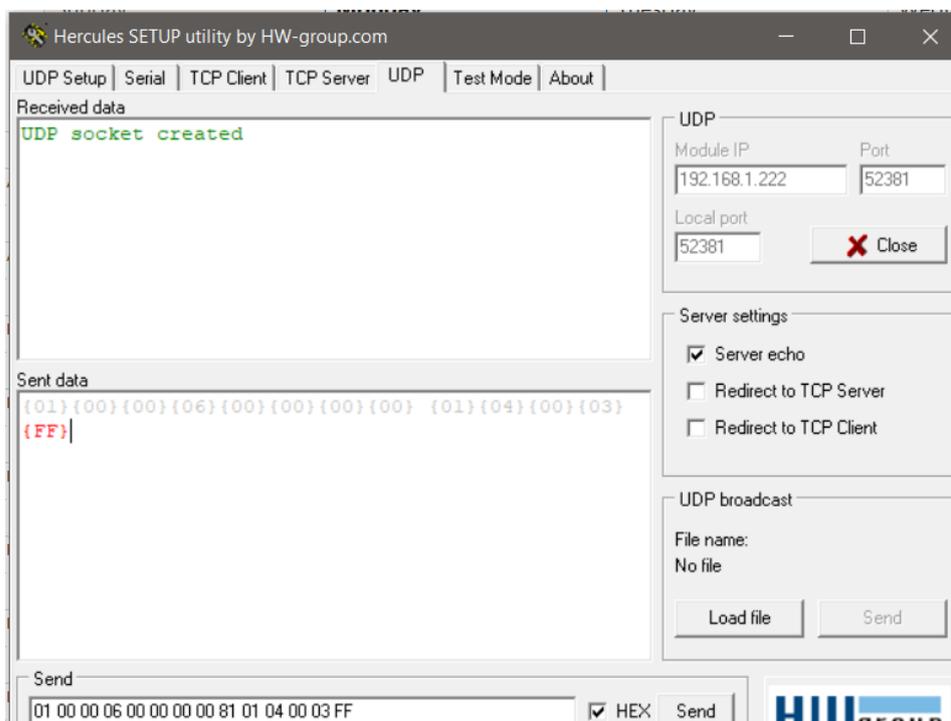
4. Next, we now want to send a basic command to the camera via Visca over IP. For a complete list of commands, refer to the PTZ310/PTZ330/PTZ330N/PTZ3xxW Control Codes document.

<https://www.averusa.com/pro-av/support/> look in the “Download” section.

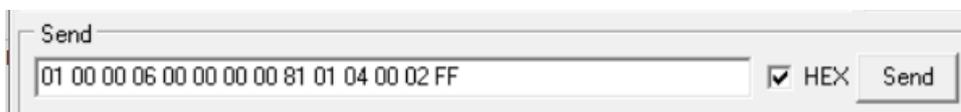
AVer PTZ3xxV1 / PTZ2xx / PTZ3xxV2 Camera Setup (continued) Hercules Software Testing

- In this example we will send a **Power Off** command to the camera.
01 00 00 06 00 00 00 00 81 01 04 00 03 FF

CAM_Power	On	8x 01 04 00 02 FF
	Off	8x 01 04 00 03 FF



- Sending the **Power Off** command is instant, the camera “may” go to a preset before powering off, if it is configured that way, the result should be that the camera has a solid “Orange/Amber” LED on the front now.
- Next, let us send a **Power On** command.
01 00 00 06 00 00 00 01 81 01 04 00 02 FF



The Orange LED should now start to blink for about 5 seconds, then the Power Up routine kicks in. The PTZ310/330 camera will take about 45 seconds to boot up.

***Note:** In later FW, the Power On/Off may be instant, no re-boot will occur.

AVer PTZ3xxV1 / PTZ2xx / PTZ3xxV2 Camera Setup (continued)

Hercules Software Testing

- Next, let us test the **Presets, Recall Preset #1**

01 00 00 07 00 00 00 00 81 01 04 3F 02 01 FF

CAM_Memory	Reset	8x 01 04 3F 00 pp FF	pp: 0x00 To 0xFF pp: 0x5A => SmartFrame Enable pp: 0x5B => SmartFrame Disable pp: 0x5C => SmartFrame Trigger pp: 0x5D => SmartShoot Enable pp: 0x5E => SmartShoot Disable pp: 0x5F => Trun on OSD menu
	Set	8x 01 04 3F 01 pp FF	
	Recall	8x 01 04 3F 02 pp FF	



At this point, the camera should have moved to Preset #1, if it was configured.

***Note:** If sending a Pan_Stop command to a **PTZ310/330/N** camera running an earlier FW than 0.70, the command string will be: 01 00 00 09 00 00 01 03 81 01 06 01 08 08 03 03 FF

- If the commands being sent are NOT working, check the UDP ports.

In Windows open a “CMD” window and type in: **netstat -a -p udp**

```

UDP    192.168.0.121:52104    *:*
UDP    192.168.0.121:52381    *:*
: \Users\v002712>
UDP    0.0.0.0:5355          *:*
UDP    0.0.0.0:52381        *:*
UDP    0.0.0.0:52787        *:*
UDP    0.0.0.0:59446        *:*

```

Verify that Port 52381 is listed.

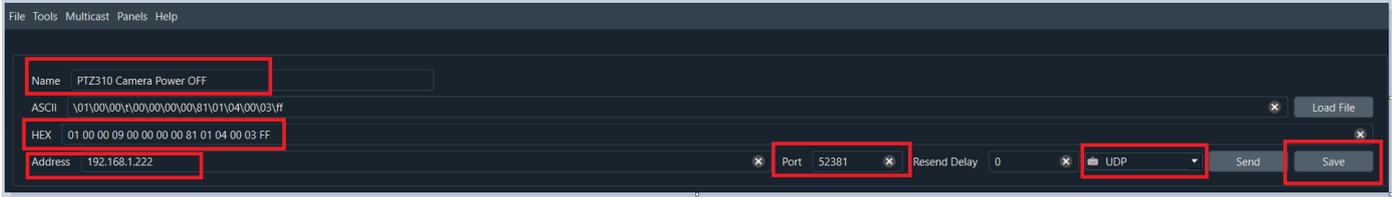
- Verify/check your Network cable connections and how they are made, adhering to BICSI standards. Typically, 568B wiring is the most common for network connections.
- If you are using a Managed network switch, verify ports are opened.
- This concludes the basic Visca over IP verification testing for the AVer PTZ310/330 cameras.

AVer PTZ3xxV1 / PTZ2xx / PTZ3xxV2 Camera Setup

Packet Sender Software

In this next section we will discuss using the Packet Sender Software to test the Visca over IP commands and verify that they are being recognized by the AVer camera.

1. Open the Packet Sender software, you should see the following.



2. Enter the Name of the command you want to create, (i.e. PTZ310 Camera Power Off).
3. Enter the HEX command for the *Power Off* command.

01 00 00 06 00 00 00 01 81 01 04 00 03 FF

The ASCII command will be "Auto populated".

The full command should be 01 00 00 06 00 00 00 01 81 01 04 00 03 FF.

RED part of command is for VISCA over IP packet header.

BLUE part of command is for the VISCA command.

(The x value of 8x should be 1 for the Visca-over-IP string command.)

VISCA over IP

PORT

Internet protocol	IPv4
Transport protocol	UDP
Port address	52381

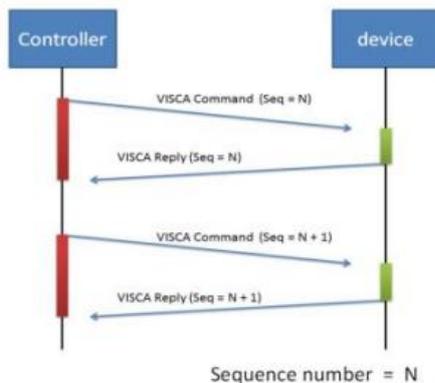
FORMAT

	byte 0	byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7	byte8 ~~~~	byte23
func	Payload type		Payload length		Sequence number					
data	Value1	Value2	1~16 (0x001~0x010)		0X00000000 ~ 0XFFFFFFF					
	VISCA Packet (see page VISCA)									

Payload type

Name	Value1	Value2	Description
VISCA command	0x01	0x00	Stores the VISCA command.
VISCA inquiry	0x01	0x10	Stores the VISCA inquiry.
VISCA reply	0x01	0x11	Stores the reply for the VISCA command or VISCA inquiry

Sequence number



AVer PTZ3xxV1 / PTZ2xx / PTZ3xxV2 Camera Setup (continued)

Packet Sender Software

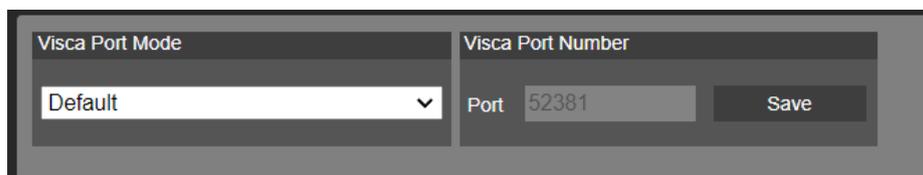
Visca command strings:

Inquiry (listed as “info”): 01 00 00 05 00 00 00 01 81 09 00 02 FF

Settings (listed as “framing”): 01 00 00 07 00 00 00 01 81 01 04 7D 00 00 FF

Command (movements): 01 00 00 09 00 00 00 01 81 01 06 01 08 08 03 01 FF

4. Enter the IP address of the camera that you want to control.
5. Enter the Port Number, 52381.
***Note:** With later FW (0.90) PTZ3xxV1 cameras, the UDP Port Number can be customized. You would need to login to the cameras *WebUI*, next go to the *Network* tab and look for the *Visca Port Mode*.



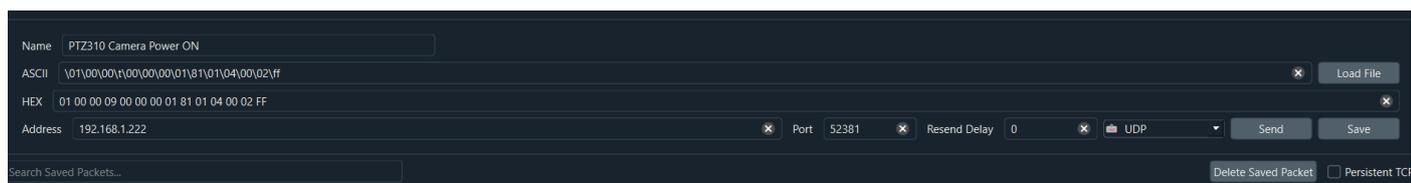
6. Next, Enter the connection type, UDP.
7. Select “Save” to save this command for future reference.
8. Next, select “Send” and you should see a response in the lower section of Packet Sender.

Time	From IP	From Port	To Address	To Port	Method	Error	ASCII	Hex
2024-01-16 19:06:52.928	192.168...	52381	You	52381	UDP		\01\11\00\03\00\00\00\90Q\xff	01 11 00 03 00 00 00 90 51 FF
2024-01-16 19:06:46.827	You	52381	192.168.1.222	52381	UDP		\01\00\00\11\00\00\00\81\01\04\00\03\xff	01 00 00 09 00 00 00 81 01 04 00 03 ff

9. At this point, the PTZ3xxV1 camera should Power Off and show an Amber LED on the front.
10. Next send the *Power On* command:

01 00 00 06 00 00 00 01 81 01 04 00 02 FF

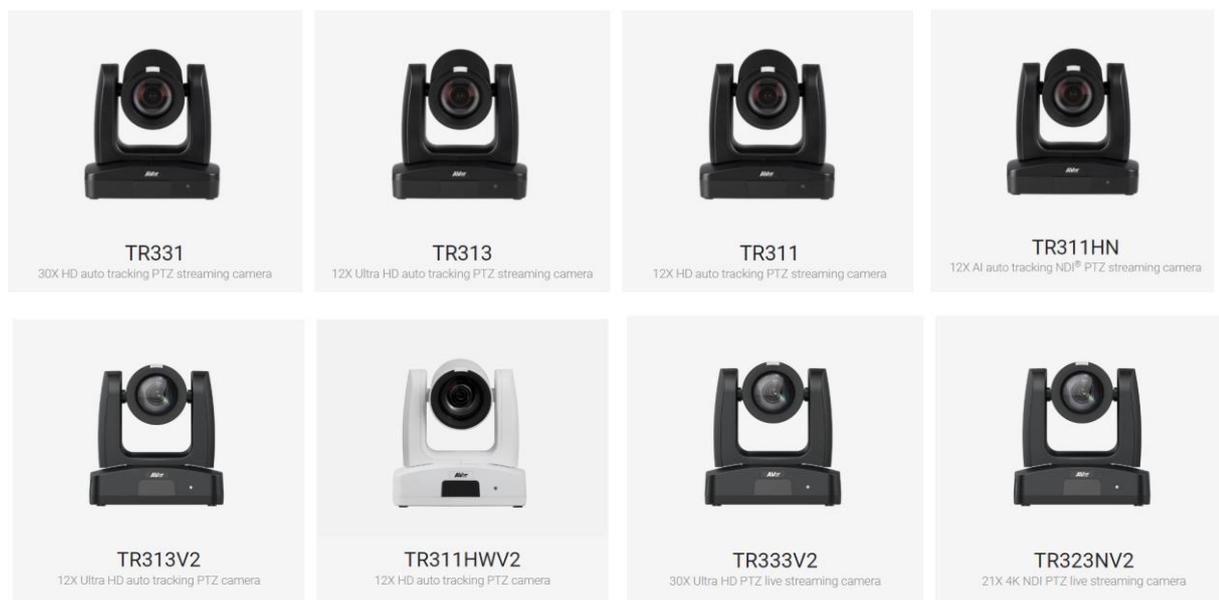
The ASCII command will be “Auto populated”.



11. Select *Send*, the PTZ3xxV1 camera should be powering up resulting in a Blue LED on the front.

AVer TR3xxV1 / TR3xxV2 Camera Setup

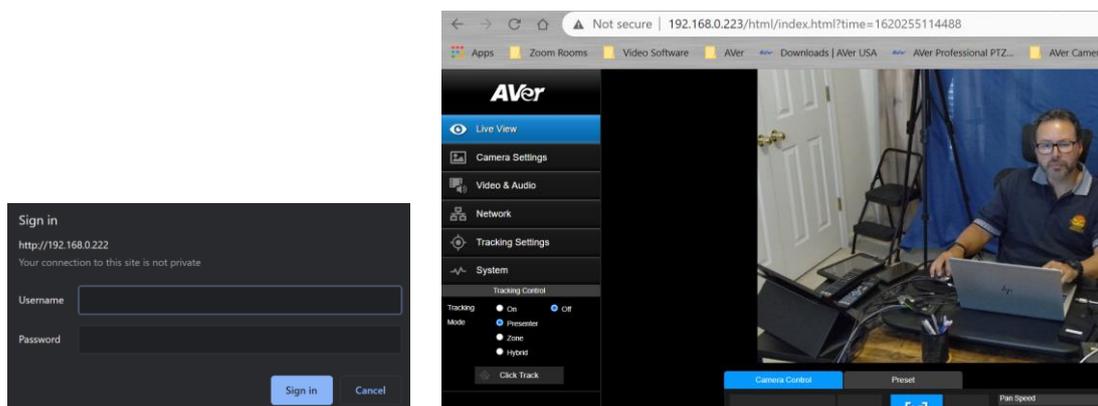
The AVer TR3xxV1 and TR3xxV2 cameras offer exceptional optical quality up to 4K UHD 2160p/60 video standards, Quad Output, SDI, HDMI, NDI HX support, SRT Ready, Advanced AI Auto Tracking, and PoE+ support.



WebUI Network Connection:

1. Once all the equipment is connected, network IP's have been assigned and configured, verify you can gain access to the TR3xxV1 / TR3xxV2 Camera by typing in the IP address in a Chrome browser.

***Note:** Edge, Safari and other browsers are not supported.



If this is the first time accessing the cameras WebUI, it will ask you for the default login credentials, which are: “admin” and “admin”.

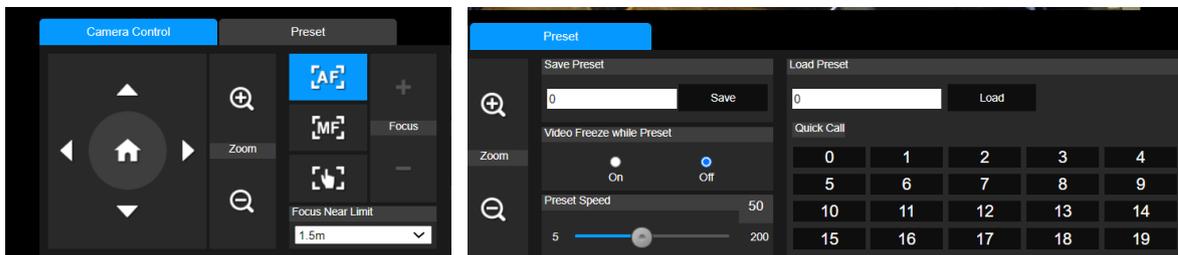
It will then ask you to change the default values, PLEASE write that information down, and then login with the NEW credentials.

AVer TR3xxV1 / TR3xxV2 Camera Setup WebUI Network Connection (continued):

Video and Audio Settings, Video Mode Available Outputs

Video Standard->	Stream Only (Various)	USB Only (Various)	USB + Streaming (Various)	NDI (1080p/60)
SDI Output	✓	✓	✓	✓
HDMI Output	✓	✓	✓	✓
USB Output	✗	✓	✓	✗
RTSP Output	✓	✗	✓	✓

- Next, verify you can control the camera via the WebUI PTZ controls and can control the Presets, Save, Load functions.



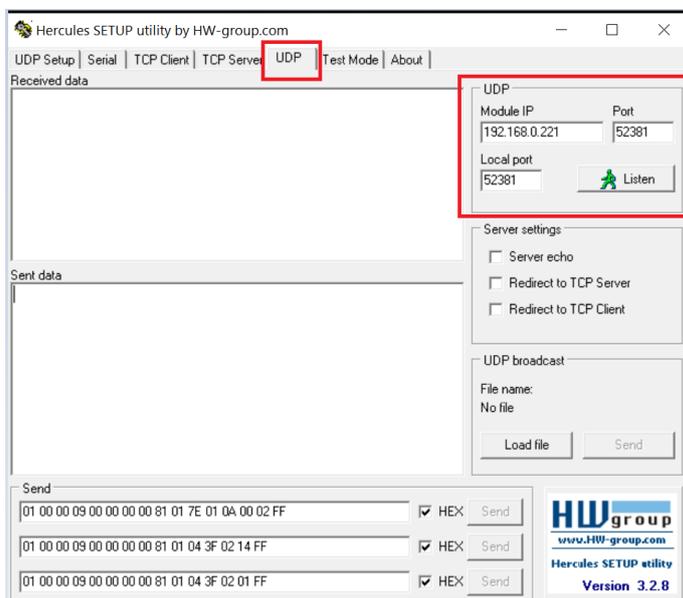
- At this point you should have full control of the camera, ability to Save and Recall Presets, if you do NOT have control, most likely the control port has been disabled/blocked. Verify that port **52381** is open on the network.
- Once the basic controls have been verified working from the WebUI of the camera, the next step is to verify the sending of Visca over IP commands work via the *Hercules* or *Packet Sender* software.

AVer TR3xxV1 / TR3xxV2 Camera Setup

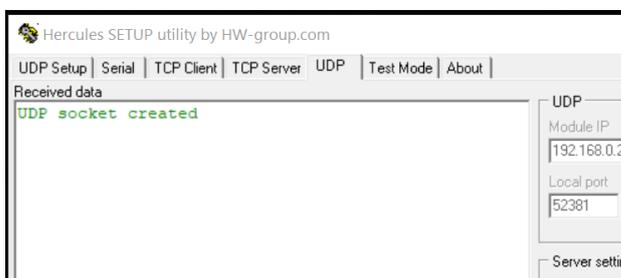
Hercules Software Testing

In this next section we will discuss using the Hercules software in a very specific way to test the Visca over IP commands are being recognized by the AVer cameras.

1. Open the Hercules software and select the UDP tab.



2. Next, enter the IP address of the camera as well as the Local/Port number 52381.
3. Next, select “Listen”, you should see a green message appear, “UDP socket created”.



4. Next, we now want to send a basic command to the camera via Visca over IP.
For a complete list of commands, refer to the TR3xxV1 / TR3xxV2 Control Codes document.
<https://www.averusa.com/pro-av/support/> look in the “Download” section.

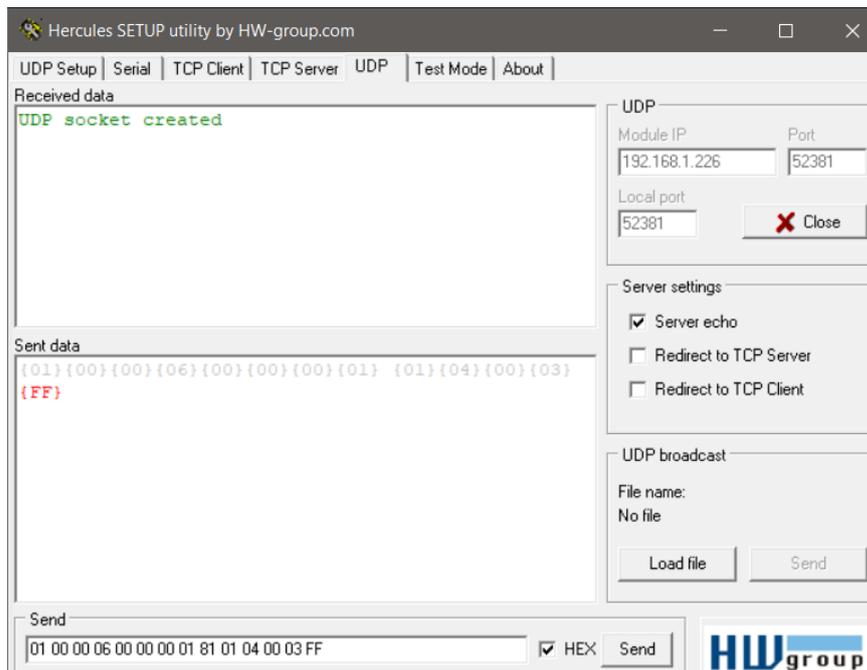
In this example we will send a **Power Off** command to the camera.

01 00 00 06 00 00 00 01 81 01 04 00 03 FF

Command Set	Command	Command Packet	Comments
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	

AVer TR3xxV1 / TR3xxV2 Camera Setup

Hercules Software Testing (continued)



5. Sending the **Power Off** command is instant, the camera “may” go to a preset before powering off, if it is configured that way, the result should be that the camera has a solid “Orange” LED on the front now and no video output.
6. Next, let us send a **Power On** command.
01 00 00 06 00 00 00 01 81 01 04 00 02 FF



The Orange LED should now start to blink, then the Power Up routine kicks in. The TR3xxV1/TR3xxV2 camera will take about 1 minute to completely boot up.

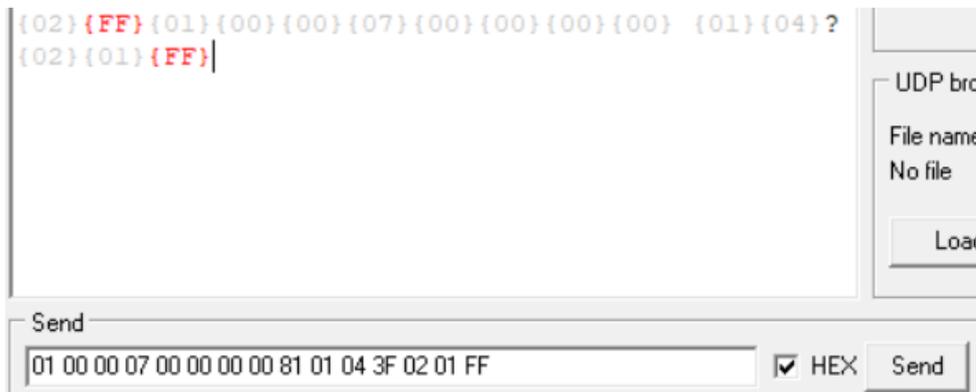
AVer TR3xxV1 / TR3xxV2 Camera Setup

Hercules Software Testing (continued)

- Next, let us test the **Presets, Recall Preset #1**

01 00 00 07 00 00 00 00 81 01 04 3F 02 01 FF

CAM_Preset	Reset	8x 01 04 3F 00 pp FF	pp: Preset Number 0x00-0xFF
	Set	8x 01 04 3F 01 pp FF	
	Recall	8x 01 04 3F 02 pp FF	



At this point, the camera should have moved to Preset #1 if it was configured.

Tracking Enable



Tracking Disable



- If the commands being sent are NOT working, check the UDP ports.

In Windows, open a "CMD" window and type in: **netstat -a -p udp**

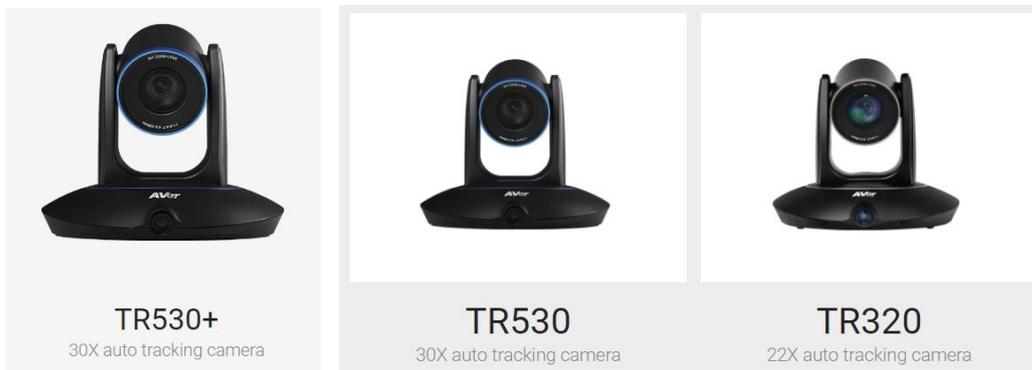


Verify that Port 52381 is listed.

- Verify/check your Network cable connections and how they are made, adhering to BICSI standards. Typically, 568B wiring is the most common for network connections.
- If you are using a Managed network switch, verify ports are opened.
- This concludes the basic Visca over IP verification testing for the AVer TR3xxV1/V2 cameras.

AVer TR530+ / TR530 / TR320 Camera Setup

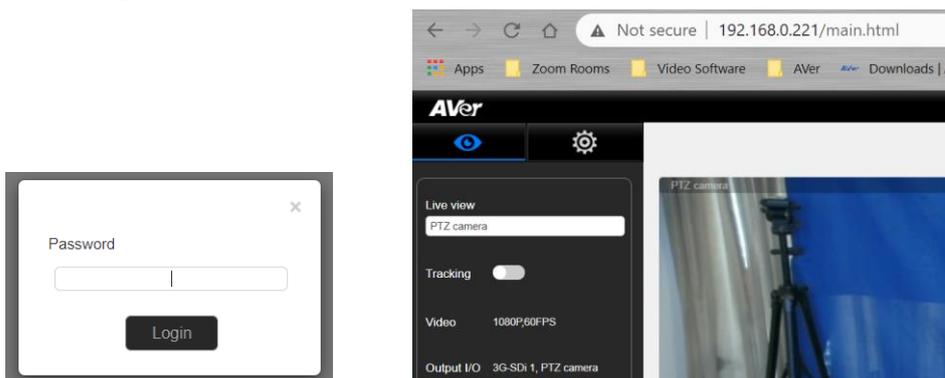
The AVer TR530+ / TR530 / TR320 cameras offer exceptional optical quality up to 1080p/60 video standards, SDI, HDMI, RTSP, and with the TR530+ you will have a USB output.



WebUI Network Connection:

1. Once all the equipment is connected, network IP's have been assigned and configured, verify you can gain access to the TR530/320 Camera by typing in the IP address in a Chrome or IE-11 browser.

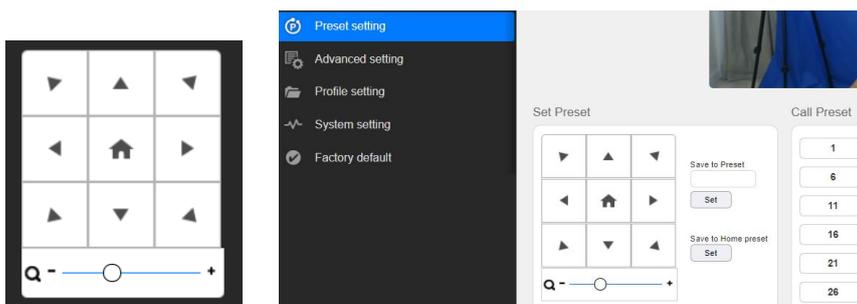
***Note:** Edge, Safari and other browsers are not supported.



If this is the first time accessing the cameras WebUI, it will ask you for the default login password, which is: "admin".

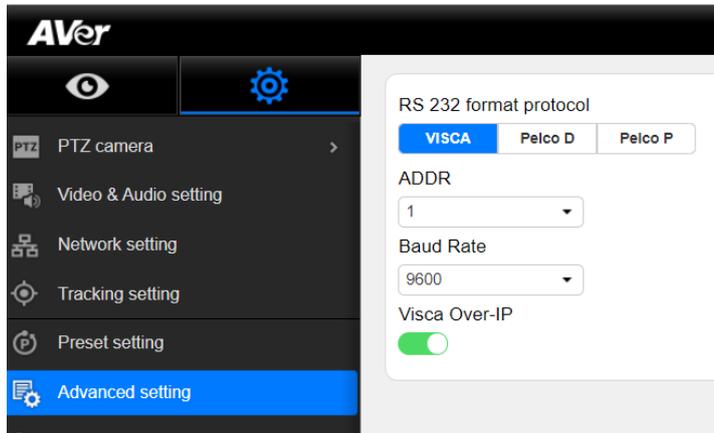
It "may" ask you to change the default values, PLEASE write that information down, and then login with the NEW credentials.

2. Next, verify you can control the camera via the WebUI PTZ controls and can control the Presets, Save, Load functions.



WebUI Network Connection (continued):

- Next, with the TR530+ / TR530 / TR320 camera we must verify that the camera has been configured for use with Visca Over IP, this is done by checking the *Advanced Setting* tab.



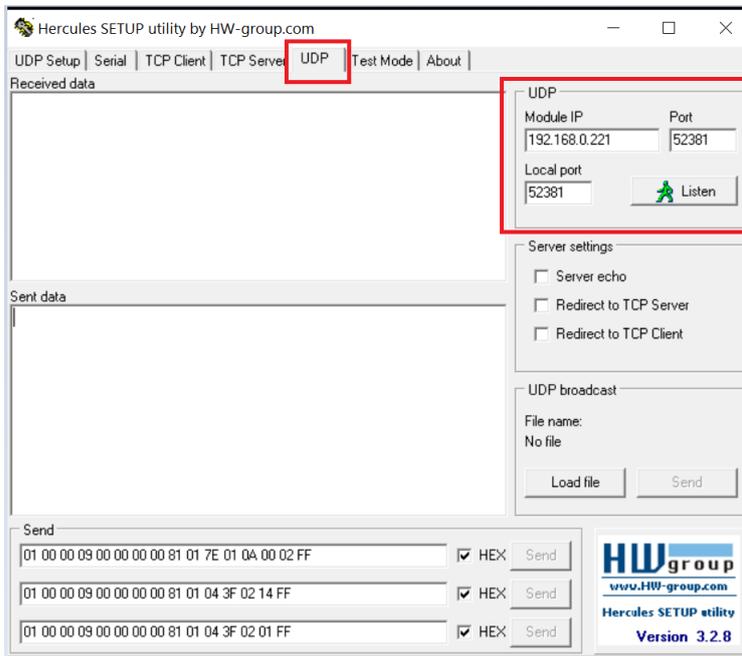
Make sure it has been ENABLED.

- Next, at this point you should have control of the camera, ability to Save and Recall Presets, if you do NOT have control, most likely the control port has been disabled/blocked. Verify that port **52381** is open on the network.
- Once the basic controls have been verified working from the WebUI of the camera, the next step is to verify that sending Visca over IP commands works via the Hercules software.

Hercules Software Testing

In this next section we will discuss using the Hercules software in a very specific way to test the Visca over IP commands are being recognized by the AVer camera.

1. Open the Hercules software and select the UDP tab.



2. Next, enter the IP address of the camera as well as Port number 52381.
3. Next, select “Listen”, you should see a green message appear, “UDP socket created”.



4. Next, we now want to send a basic command to the camera via Visca over IP. For a complete list of commands, refer to the TR530 / TR320 Control Codes document. <https://www.averusa.com/pro-av/support/> look in the “Download” section.

NOTE:

In the previous camera examples, we showed Power On/OFF, the TR530+/TR530/320 camera **does NOT support the Power ON command via Visca OVER IP.** It does, however, work when connected via RS-232.

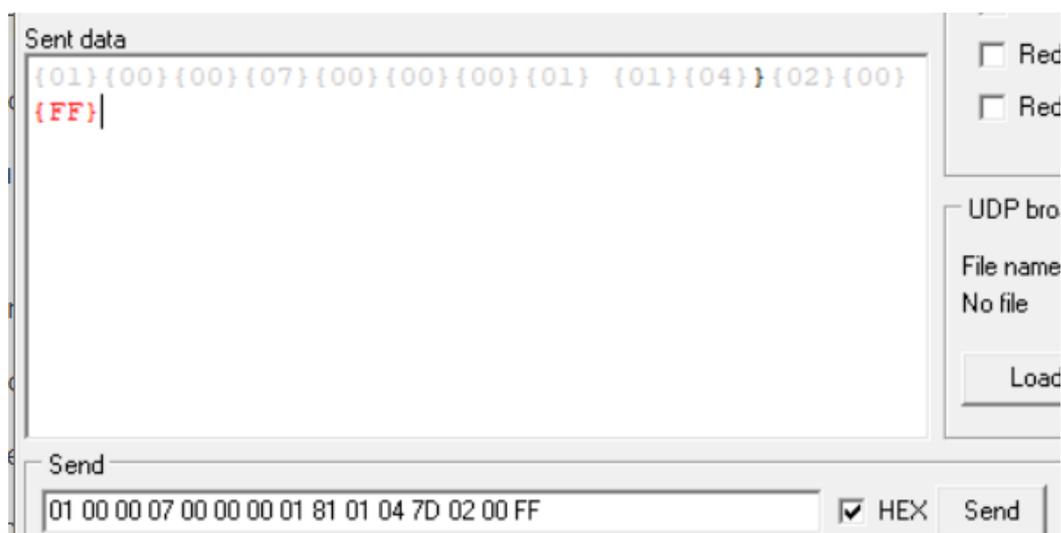
CAM_Power	On	8x 01 04 00 02 FF	*RS-232 support, over IP not support
	Off	8x 01 04 00 03 FF	

Hercules Software Testing (continued)

In this example we will send a **Camera Tracking ON** command to the camera.

01 00 00 07 00 00 00 00 81 01 04 7D 02 00 FF

CAM_Track_ON		8x 01 04 7D 02 00 FF
CAM_Track_OFF		8x 01 04 7D 03 00 FF



5. You should see the TR530/TR530+ front blue LED begin to blink every 2 seconds.

6. Next, send the **Camera Tracking OFF** command to the camera.

01 00 00 07 00 00 00 00 81 01 04 7D 03 00 FF

7. Next, let us test the **Presets, Recall Preset #1**

01 00 00 07 00 00 00 00 81 01 04 3F 02 01 FF

CAM_Preset	reset	8x 01 04 3F 00 YY FF	YY = preset num(0-0x7F)
	set	8x 01 04 3F 01 YY FF	
	recall	8x 01 04 3F 02 YY FF	



At this point, the camera should have moved to Preset #1 if it was configured.

Hercules Software Testing (continued)

8. If the commands being sent are NOT working, check the UDP ports.

In Windows, open a "CMD" window and type in: **netstat -a -p udp**

```
UDP    192.168.0.121:52104    *:*
UDP    192.168.0.121:52381    *:*
:\Users\v002712>
UDP    0.0.0.0:5355          *:*
UDP    0.0.0.0:52381        *:*
UDP    0.0.0.0:52787        *:*
UDP    0.0.0.0:59446        *:*
```

Verify that Port 52381 is listed.

9. Verify/check your Network cable connections and how they are made adhering to BICSI standards. Typically, 568B wiring is the most common for network connections.
10. If you are using a Managed network switch, verify ports are opened.
11. This concludes the basic Visca over IP verification testing for the AVer Pro-AV cameras.

Crestron Example:

I had captured some Crestron control line syntax from another project, they were using Crestron Toolbox. This example shows Recalling Preset 5 on a TR530 camera.

```
User set CAM1_Preset5_tp to Press
CAM1_Preset5_tp          1
CAM1_Preset4_fb         0
CAM1_Preset5_fb         1
CAM_Preset4_fb          0
CAM_Preset5_fb          1
User set CAM1_Preset5_tp to Release
CAM1_Preset5_tp         0
CAM1_tx$                \x81\x01\x04?\x02\x04\xff
//CAM1_rx$              \x90AA
//CAM1_rx$              \xff\x90Q
//CAM1_rx$              Q\xff
```