INOGENI

INOGENI U-CAM

User guide

Version 1.9

July 3, 2025

VERSION HISTORY

Version	Date	Description
1.0	April 19, 2022	First release.
1.1	May 27, 2022	• Second release. • Adding RS232 API. • Adding REST API.
1.2	July 12, 2022	• Update image to support new hardware revision. • Change REST API functions to have same name as RS232 API. • Add HTTP to HTTPS redirection for webpage.
1.3	September 30, 2022	• Added audio input switching.
1.4	October 25, 2022	• Modified “disableSerialInterface” function description. • Adding new functions over LAN interface.
1.5	September 25, 2023	• Adding new section for webpage. • Updated specifications for firmware release v2.2. • Elaborate on RS232 and RESTAPI commands.
1.6	October 20, 2023	• Adding description on REST API token format.
1.7	May 16, 2025	• Adding precisions to PTZ commands.
1.8	June 09, 2025	• Adding Autoframe, Speaker focus and Presets commands over RESTAPI and RS232. • Update image to reflect firmware version 2.17.
1.9	July 03, 2025	• Adding USB friendly name and standby mode commands over RESTAPI and RS232. • Update image to reflect firmware version 2.18.

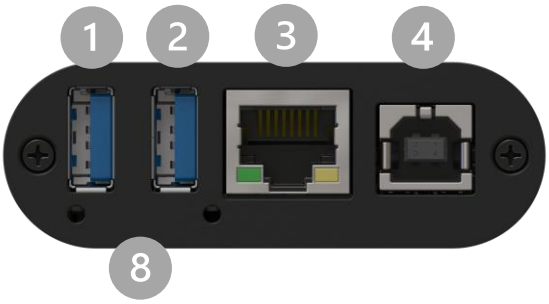
CONTENTS

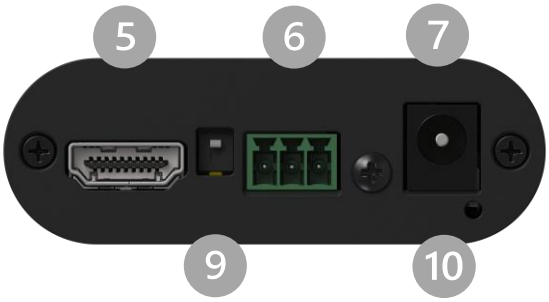
TYPICAL APPLICATION

Here is a typical connection diagram used for the U-CAM device in a videoconferencing setup.

DEVICE INTERFACES

Here are the devices interfaces.





1. USB input #1
2. USB input #2
3. LAN port
4. USB 2.0 output
5. HDMI output
6. RS232 port
7. +12V power input
8. USB device detection leds
9. Factory upgrade switch
10. System activity led

LEDS BEHAVIOR

Here are the leds behavior:

USB input	
OFF	No USB camera/device connected.
SOLID	USB camera/device connected.
System activity led	
OFF	No power present on board.
BLINK	System firmware running correctly.

SPECIFICATIONS

Here is the complete specification.

Physical details	
Dimensions (W x L x H)	70 x 83 x 23 mm
Power supply	12V
Power consumption	Up to 1.2A
Weight	136 g
Package content	1 x USB 2.0 Type-B to Type-A cable. 1 x terminal block connection. 1 x 12V power supply.
Operating temperature	0° to 45° C (32° to 113° F)
Storage temperature	-40° to 105° C (-40° to 221° F)
Origin	Canada
Warranty	5 years

USB inputs	
2x USB 3.0 inputs	Capture video and audio from USB 3.0 and 2.0 cameras Capture is done from a single camera à
Video capabilities	MJPEG: Up to 1080p30 using USB 2.0/3.0 YUYV: Up to 1080p60 using USB 3.0, 1080p10 using USB 2.0
Audio capabilities	Device will capture embedded audio from USB camera or external USB device and will output through HDMI.
USB Power	Up to 1.2A shared between the USB ports

HDMI output	
Resolution	3840x2160p23.98/24/25/29.97/30 fps, 1080p50/60 fps, 720p50/60 fps
Connector	HDMI

USB output	
USB connector	1x USB 2.0 Type-B UVC interface up to 1080p30 MJPEG. UAC interface with audio I/O. PTZ control supported.

Control	
Control options	RS-232 LAN USB
IP interface	100 Mbps half-duplex (autonegotiation not supported) Supports DHCP or static IP addressing
RS232 interface	Baud rate: 9600 Data bits: 8 Stop bits: 1 Parity: None Flow control: None

Certifications	
HDCP compliant	The device does not decrypt BD/DVD movies, satellite/cable receivers or other encrypted sources.
Certifications	FCC, CE, UKCA, RoHS, IEC62368, SoV, RCM
TAA-compliant	Yes

Compatibility	
Operating system	NO driver installation necessary Windows 7 and above (32/64-bit) macOS 10.10 and above,
Cameras Supported	Cameras (or video Source) with an USB output
Software Compatibility	UVC-compliant. Runs with all software compatible to DirectShow/MediaFoundation, V4L2, QuickTime and AVFoundation.

SERIAL COMMUNICATION PROTOCOL

Here is the complete list of commands provided through the serial connection. As written on the back of the device, here is the pinout of the terminal block.

Pin 1: Receive
Pin 2: GND
Pin 3: Transmit
Pin 4: 5V supply (for INOGENI Remote)

NOTE: The user needs to put a **space character between the command name and argument**.

You need to add a carriage return **<CR>** character and a line feed **<LF>** character at the end of the command string.

Typically, commands will return "ACK**<CR><LF>**" in case of success and "NACK**<CR><LF>**" in case of failure.

Baud rate: 9600 [default] // **Data bits**: 8 // **Stop bits:** 1 // **Parity:** None // **Flow control:** None

Note that if serial interface was disabled using REST API, commands will not be parsed, and no response will be provided.

Baud rate: 9600 // **Data bits**: 8 // **Stop bits:** 1 // **Parity:** None // **Flow control:** None

Command	Argument(s)
HELP Return command list with description.	None
RSTR Restore default settings.	None
RESET Reset/reboot the device.	None
IP Return IP address.	None
VERSION Return firmware version.	None
QUIT Restart application.	None
STATUS Return device, video/audio inputs and HDMI output status.	None
PAN Relative pan.	1 argument (integer) The sign specifies the direction. We multiply the argument by the camera smallest step, and if the speed is too fast, we go as fast as the camera allows. We recommend using values between `-10` and `10`. You need to send `0` to stop the camera motion.
TILT Relative tilt.	1 argument (integer) The sign specifies the direction. We multiply the argument by the camera smallest step, and if the speed is too fast, we go as fast as the camera allows. We recommend using values between `-10` and `10`. You need to send `0` to stop the camera motion.

ZOOM Relative zoom.	1 argument (integer) The sign specifies the direction. We multiply the argument by the camera smallest step, and if the speed is too fast, we go as fast as the camera allows. We recommend using values between `-10` and `10`. You need to send `0` to stop the camera motion.

SETAUTOFRAME	1 argument (integer)
	The argument specifies if we want to enable or disable autoframe on the current source camera.
	`0 => OFF`
	`1 => ON`

SETSPEAKERFOCUS	1 argument (integer)
	The argument specifies if we want to enable or disable speaker focus on the current source camera.
	`0 => OFF`
	`1 => ON`

SETPRESET	1 argument (integer) The argument specifies the #preset to save the current camera position.
GOTOPRESET	1 argument (integer) The argument specifies the #preset to go to on the current camera.

SETVIDEOFORMAT
 	
Set video input format.
	1 argument (integer)
	`0 => 1st preferred format`
	`1 => 2nd preferred format`
	`2 => 3rd preferred format`
	`3 => 4th preferred format`

GETVIDEOFORMATS Get video input format.	None
SETAUDIOINPUT Set audio input.	1 argument (integer) The argument specifies the index of the audio input. To see available inputs, use STATUS command.

ENUSBCDCNCM
 	
Enable/Disable the USB CDC-NCM interface over USB2.0 output.
	1 argument (integer)
	The argument specifies if we want to enable or disable the interface.
	`0 => OFF`
	`1 => ON`

ENUSBOUTSPEAKER
 	
Enable/Disable the USB speaker interface over the USB 2.0 output.
	1 argument (integer)
	The argument specifies if we want to enable or disable the interface.
	`0 => OFF`
	`1 => ON`

ENUSBOUTMIC
 	
Enable/Disable the USB mic interface over the USB 2.0 output.
	1 argument (integer)
	The argument specifies if we want to enable or disable the interface.
	`0 => OFF`
	`1 => ON`

SETUSBFNAME Set friendly name for the USB device. The new name will be applied on the next startup.	1 argument (text) The argument specifies the friendly name for the USB device. The text must be put between “ “.

ALLOWSTANDBYMODE
 	
Enable/Disable standby mode. When enabled, cameras will go into standby mode when there is no USB streaming and HDMI output.
	1 argument (integer)
	The argument specifies if we want to enable or disable standby mode.
	`0 => OFF`
	`1 => ON`

LAN COMMUNICATION PROTOCOL

You can access the device settings through its LAN interface. The LAN interface uses DHCP (default) and static IP addressing. You can obtain the IP from the INOGENI Control App or from the serial port IP command. Note that LAN is set to 100Mbps half-duplex.

CDC-NCM COMMUNICATION PROTOCOL

The device can also be controlled through CDC-NCM interface exposed on the USB2.0 device port.

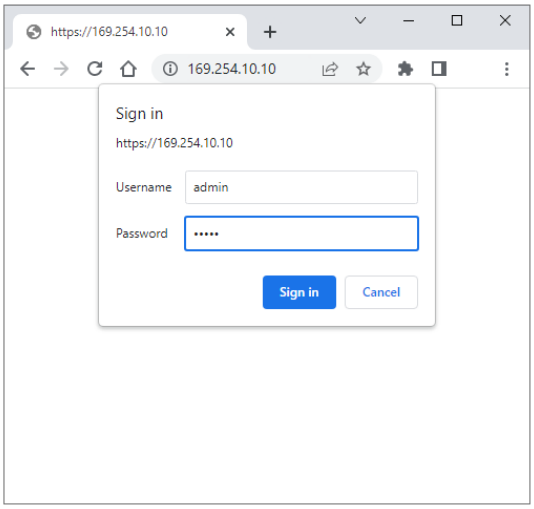
This interface has the same functions as the LAN interface, except the requests are done through USB to ease configuration.

CDC-NCM IP address: 169.254.10.10

WEBPAGE

Here is the webpage that can be used to configure and upgrade the device. This webpage is accessible through IP or through the CDC-NCM interface over USB2.0.

The username is “**admin**”, and the default password is “**admin**”.



The **STATUS** page will give you information about the firmware installed. video and audio devices that you can monitor.

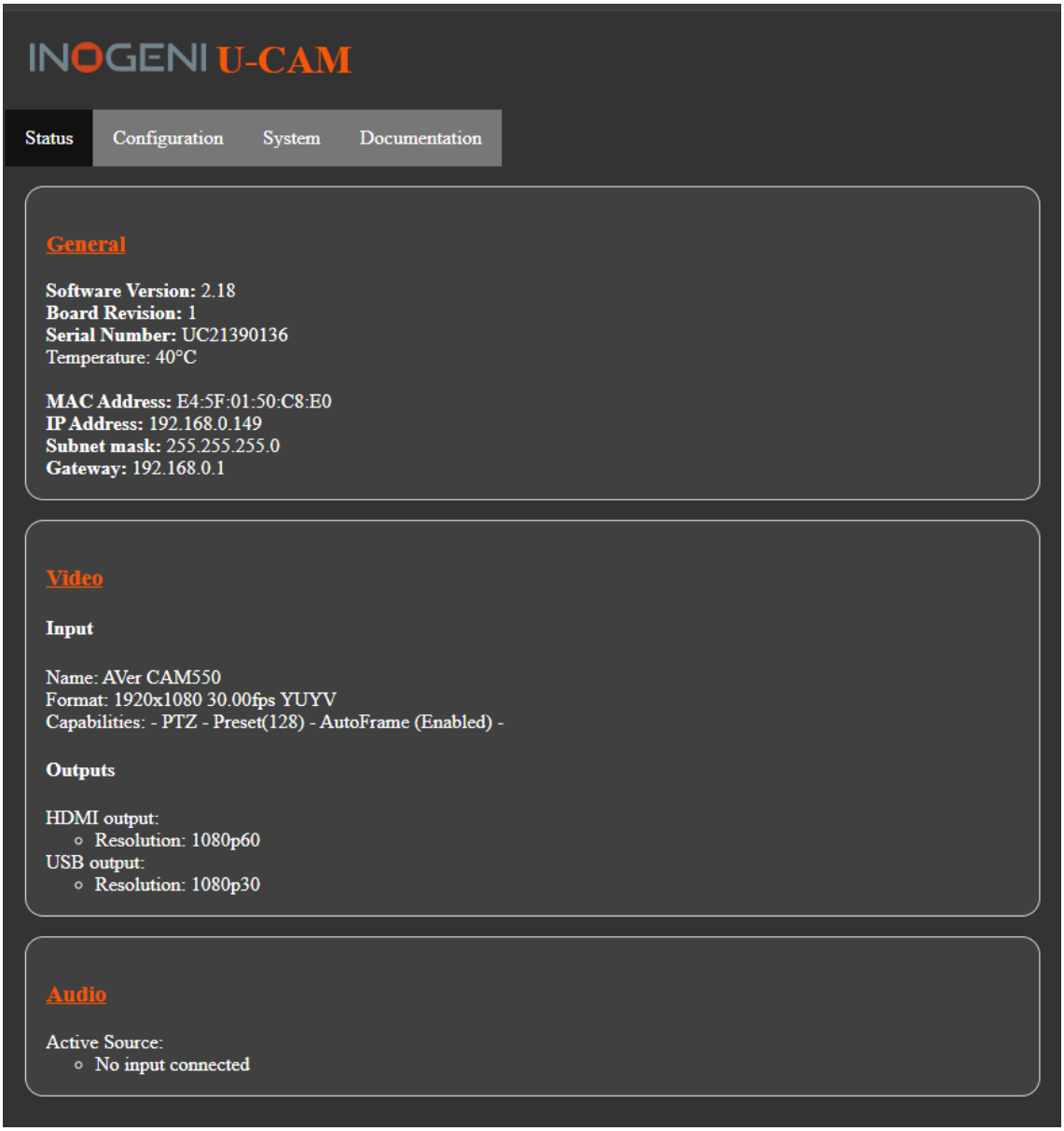


Figure 1: Status preview

The **CONFIGURATION** tab will allow you to :

- Set the HDMI resolution over HDMI.
- Set the selected camera source.
- Set the audio input.

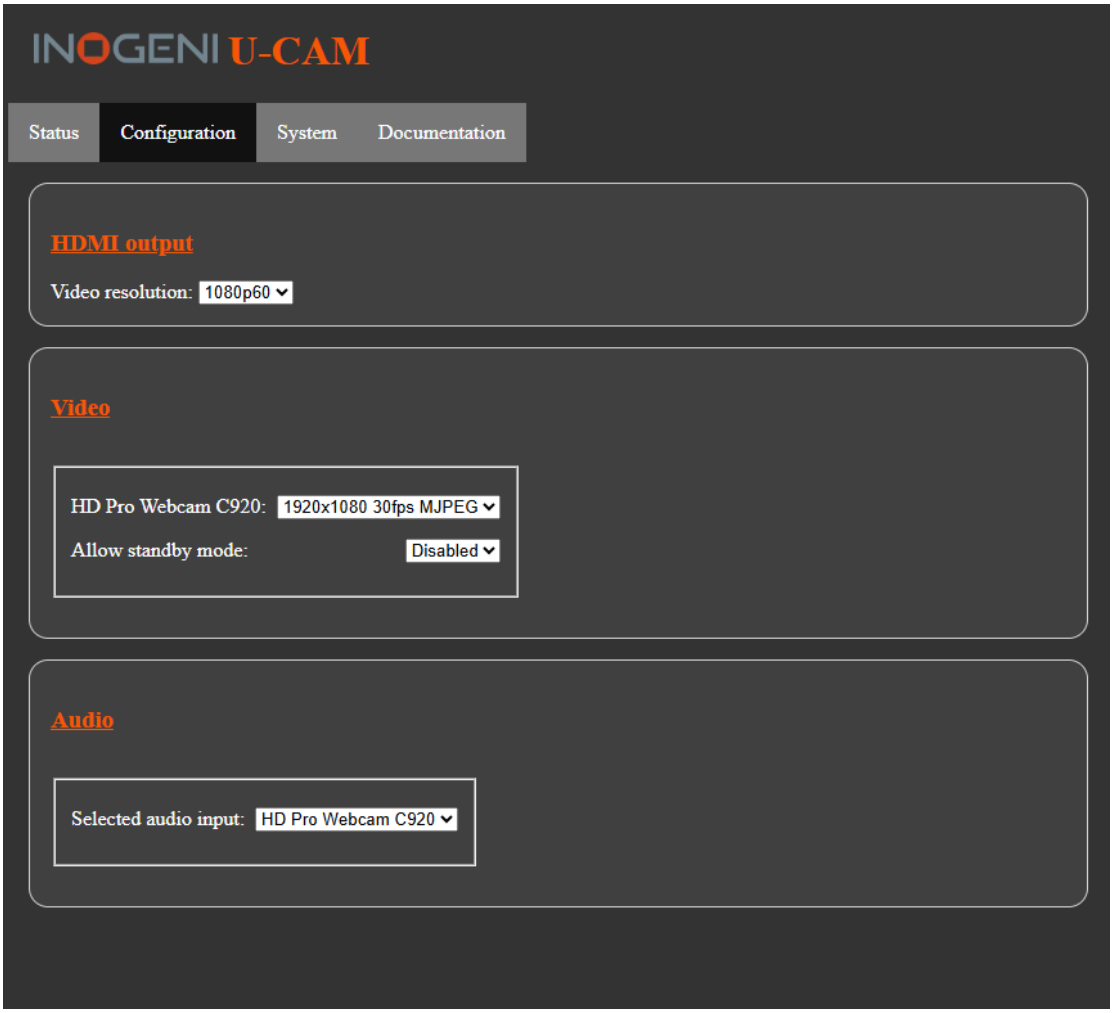


Figure 2: Configuration preview

The **SYSTEM** tab will allow you to :

- Change the current password for accessing device settings.
- Get/Set REST API access token needed using REST API interface.
- Change network settings of your device.
- Restore default settings and reboot the system.
- Update your system.

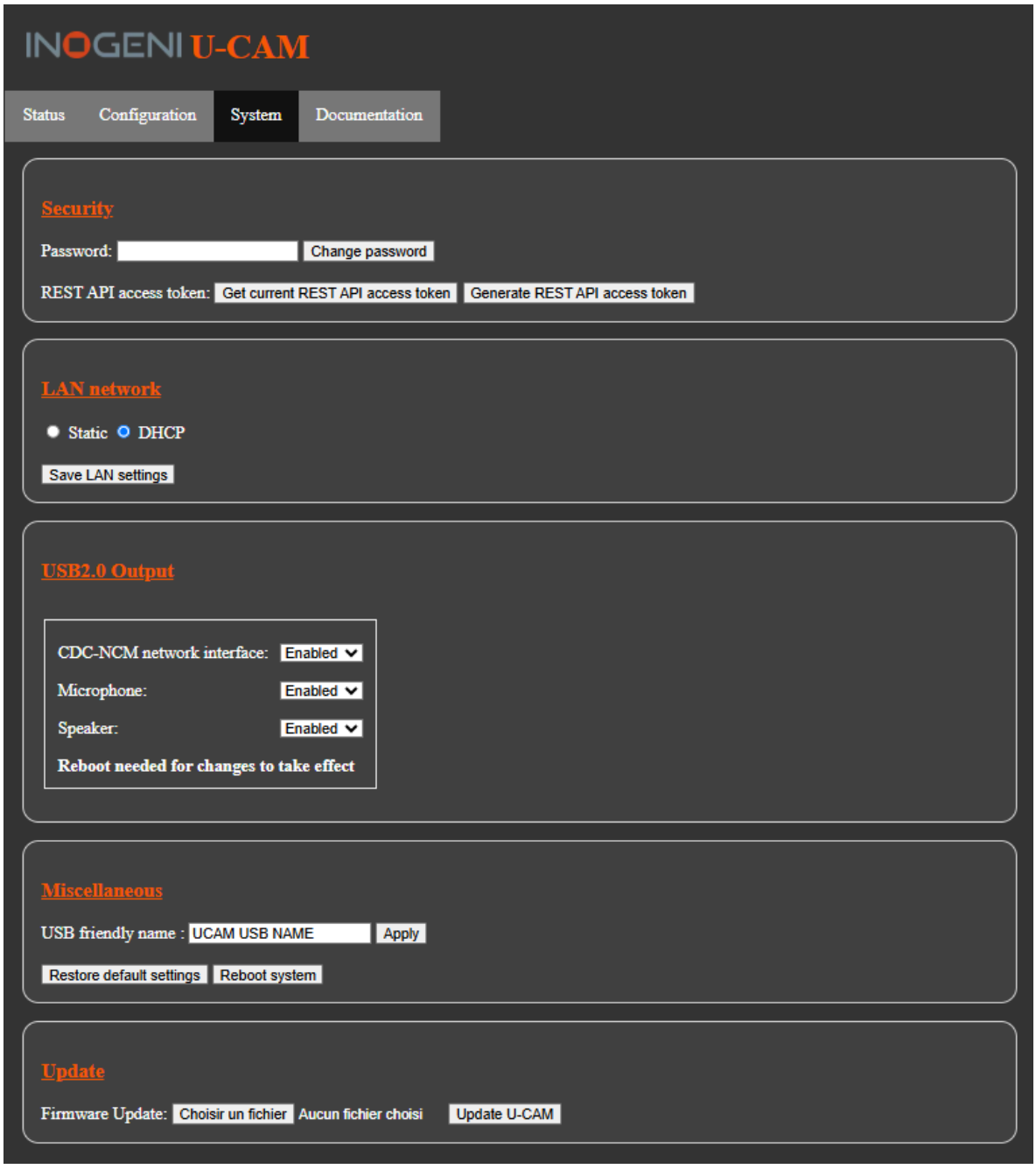
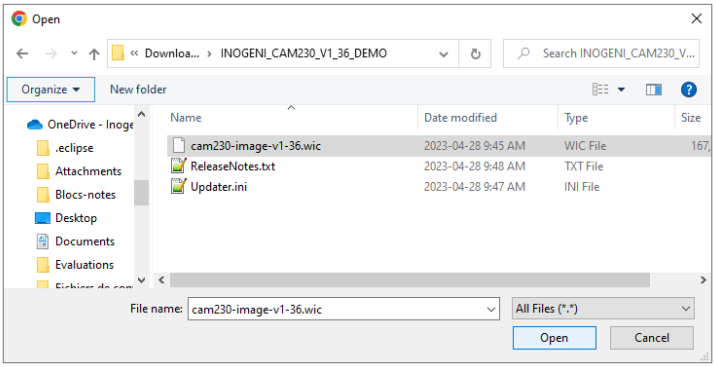


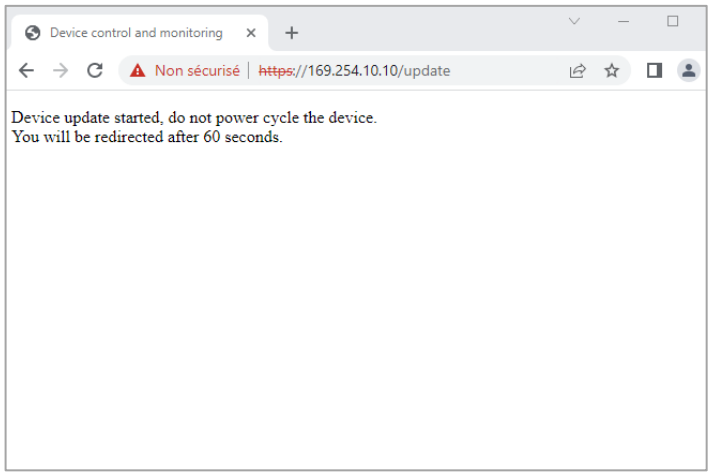
Figure 3: System preview

To update your system, please do the following :

- Click on the “Choose File” button and browse to the WIC file downloaded from our website.



- Click on “Update U-CAM” button to proceed to the update. The operation can take up to 1 minute. The device will reboot and browser will be refreshed.



The **DOCUMENTATION** tab will allow you :

- Get to the latest user guide.
- Go to product webpage.

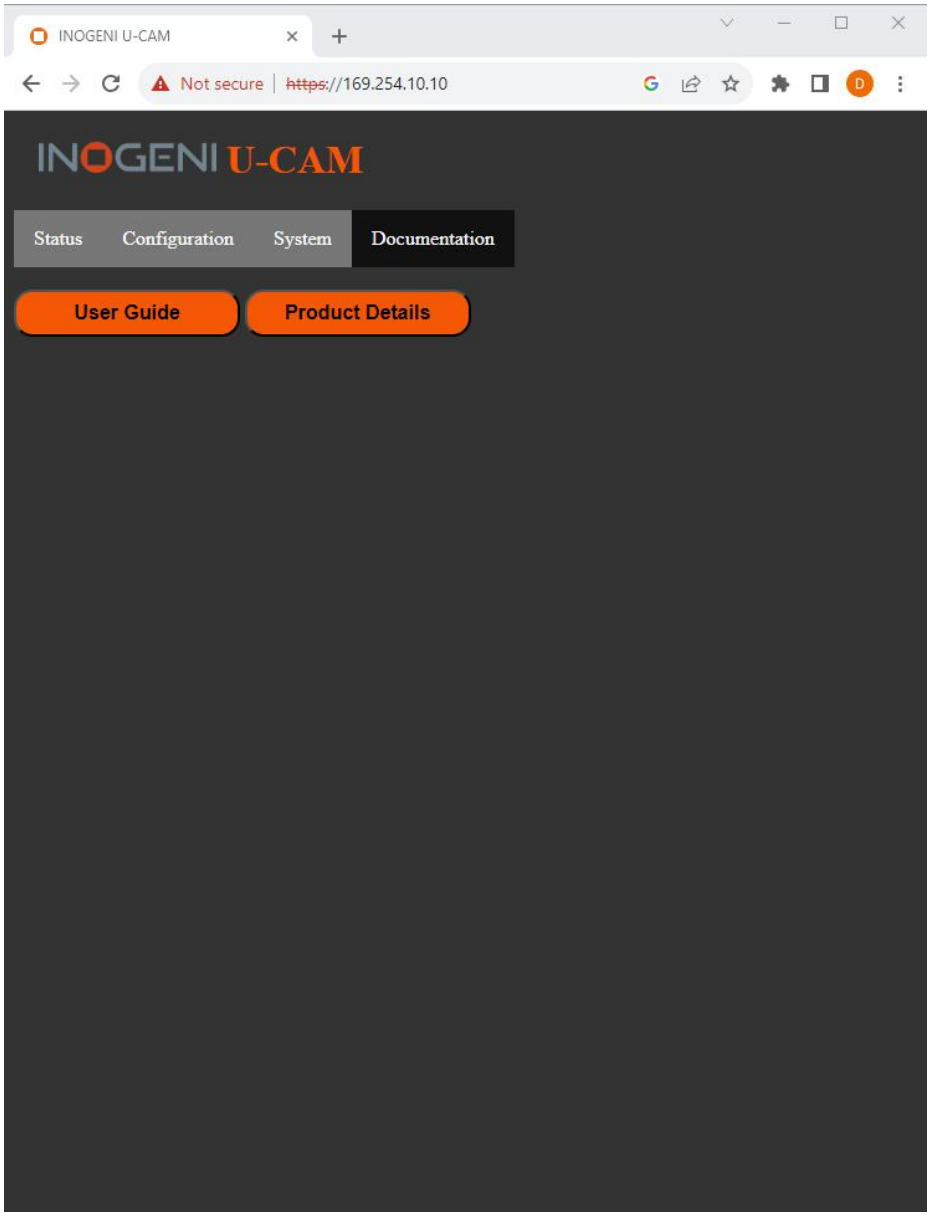


Figure 4: Documentation preview

The first time you access the webpage, your web browser is likely to complain that the connection is insecure. The reason for this is because we are using self-signed HTTPS certificates, because certificate providers will not provide certificates for addresses that are not globally accessible.

The webpage can set HDMI resolution, USB video input format, webpage password, or the REST API access token. Please note that in the case of the REST API token, we can only ask for the device to generate a new randomly generated token. It can also be used to upgrade the device firmware.

The response will usually be JSON formatted with a “message” field containing a JSON string explaining the cause of the error or “success” in case of success. Note that we are using self-signed certificates.

You can enable a bearer authentication in the HTTP header (Authorization: Bearer <token>) through our configuration page to increase security on the API.

There will be a return code to each call with the following commands:

```
200 => success
400 => error
401 => authorization error
```

Here is the complete list of commands supported through the REST API (excluding password change, firmware update, bearer token get/set):

Command URL	Body arguments	Return body
HTTP GET/POST **https://<IP>/api/v1/rstr** Restore default settings.		`{ "message": <String> }`
HTTP GET/POST **https://<IP>/api/v1/reset** Reset/reboot the device.		`{ "message": <String> }`
HTTP GET/POST **https://<IP>/api/v1/version** Returns firmware version.		`{ "message": <String> }`
HTTP GET **https://<IP>/api/v1/status** Return device, video/audio inputs and HDMI output status.		JSON object with multiple fields
HTTP GET/POST **https://<IP>/api/v1/pan** Relative pan.	`pan=<pan>` The sign specifies the direction. We multiply the argument by the camera smallest step, and if the speed is too fast, we go as fast as the camera allow. We recommend using values between `-10` and `10`. You need to send `0` to stop the camera motion.	`{ "message": <String> }`
HTTP GET/POST **https://<IP>/api/v1/tilt** Relative tilt.	`tilt=<tilt>` The sign specifies the direction. We multiply the argument by the camera smallest step, and if the speed is too fast, we go as fast as the camera allow. We recommend using values between `-10` and `10`. You need to send `0` to stop the camera motion.	`{ "message": <String> }`
HTTP GET/POST **https://<IP>/api/v1/zoom** Relative zoom.	`zoom=<zoom>` The sign specifies the direction. We multiply the argument by the camera smallest step, and if the speed is too fast, we go as fast as the camera allow. We recommend using values between `-10` and `10`. You need to send `0` to stop the camera motion.	`{ "message": <String> }`

HTTP GET/POST
https://<IP>/api/v1/setAutoframe
 	
Enable / Disable Autoframe on selected camera
	`autoframe=<autoframe>`
	
	<autoframe> options:
	`0 => OFF`
	`1 => ON`
		`{ "message": <String> }`

HTTP GET/POST
https://<IP>/api/v1/setSpeakerfocus
 	
Enable / Disable Speaker Focus on selected camera
	speakerfocus=<speakerfocus>
	
	<speakerfocus> options:
	0 => OFF
	1 => ON
		{
		"message": <String>
		}

HTTP GET/POST
https://<IP>/api/v1/setPreset
 	
Save current camera position to preset received in argument
	preset=<preset>
	
	<preset> options:
	0 to Number of preset supported by selected camera.
		{
		"message": <String>
		}

HTTP GET/POST
https://<IP>/api/v1/gotoPreset
 	
Move camera to position indicated by preset received in argument
	preset=<preset>
	
	<preset> options:
	0 to Number of preset supported by selected camera.
		{
		"message": <String>
		}

HTTP GET/POST
https://<IP>/api/v1/setVideoFormat
 	
Set video input format.
	x-www-form-urlencoded
	format=<formatIndex>
	
	<formatIndex> options:
	See getVideoFormats command for available formats.
		{
		"message": <String>
		}

HTTP GET **https://<IP>/api/v1/** **getVideoFormats** Get video input format.		JSON array containing all formats for input.
HTTP GET/POST **https://<IP>/api/v1/setAudioInput** Set audio input.	input=<Integer> The argument specifies the index of the audio input. To see available inputs, use “status” command.	JSON object with message field explaining error if any

HTTP GET/POST
https://<IP>/api/v1/
disableSerialInterface
 	
Disable serial interface.
	disable=<disable>
	
	If <disable> is 1, will disable serial interface API to give IP interface exclusive access to serial port, otherwise serial interface API is enabled.
	
	When IP interface has exclusive access to serial port, user must use the “serialRead” and “serialWrite” commands.
		{
		"message": <String>
		}

HTTP GET
https://<IP>/api/v1/serialRead
 	
Read serial data from RS232.
		{
		"message": <String>
		}
		
		Message field contains characters read from RS232

HTTP GET/POST
https://<IP>/api/v1/serialWrite
 	
Write serial data to RS232. Giving content to write in URL is not supported.
	<Content to write>	{
		"message": <String>
		}

HTTP GET/POST
https://<IP>/api/v1/setNetwork
 	
Configure network settings.
	x-www-form-urlencoded
	<mode> options:
	static => addressing is static
	dhcp => use DHCP addressing
	
	If mode is static, must provide following args:
	<ip> option:
	String defined IP address. Example:
	192.168.0.20
	
	<netmask> option:
	String defined netmask address. Example:
	255.255.0.0
	
	<gateway> option:
	String defined gateway address. Example:
	192.168.0.1
		{
		"message": <String>
		}

HTTP GET/POST
https://<IP>/api/v1/
enUsbCdcNcm
 	
Enable/Disable the USB CDC-NCM interface over USB2.0 output.
	enable=<enable>
	
	<enable> options:
	0 => OFF
	1 => ON
		{
		"message": <String>
		}

HTTP GET/POST
https://<IP>/api/v1/
enUsbOutSpeaker
 	
Enable/Disable the USB speaker interface over the USB 2.0 output.
	enable=<enable>
	
	<enable> options:
	0 => OFF
	1 => ON
		{
		"message": <String>
		}

HTTP GET/POST
https://<IP>/api/v1/
enUsbOutMic
 	
Enable/Disable the USB microphone interface over the USB 2.0 output.
	enable=<enable>
	
	<enable> options:
	0 => OFF
	1 => ON
		{
		"message": <String>
		}

HTTP POST
https://<IP>/api/v1/
setUsbFriendlyName
 	
Enable/Disable the USB microphone interface over the USB 2.0 output.
	friendlyName=<friendlyName>
	
	The value must be a string containing only alphanumeric characters, spaces, "-" and "_". Its length must be between 3 and 30 characters.
		{
		"message": <String>
		}

HTTP GET/POST
https://<IP>/api/v1/
allowStandbyMode
 	
Enable/Disable standby mode. When enabled, cameras will go into standby mode when there is no USB streaming and HDMI output.
	enable=<enable>
	
	<enable> options:
	0 => OFF
	1 => ON
		{
		"message": <String>
		}

It is also possible to embed arguments to an API call inside the URL to ease configuration with some control systems with the following topology:

GET https://<IP>/api/v1/**<COMMAND>**?**<ARG1>=value**&**<ARG2>=value**

where **<COMMAND>**, **<ARG1>** and **<ARG2>** are command and associated arguments.

For example, using the **setVideoFormat** command, you can issue the following request:

GET https://<IP>/api/v1/**setVideoFormat**?**formatIndex=0**

This request will set the input to format index 0.

The following commands allow to perform password management, bearer token management and firmware update. The authentication used is basic auth, and we use the same user and password as the webpage (default user=admin password=admin).

Command URL / Description	Body arguments	Return body
HTTP POST https://<IP>/api/v1/changePassword?password=<newPassword> Change the webpage password to <newPassword>.		`{ "message": <String> }`
HTTP GET https://<IP>/api/v1/getAccessToken Return the bearer token.		`{ "token": <String> }` If no bearer token is set, the "token" field will be null.
HTTP POST https://<IP>/api/v1/generateAccessToken Generate random access token.		`{ "message": <String> }`
HTTP POST https://<IP>/api/v1/update Sends update file to device.	Must use formdata body. The key must be myFile, and the value is of type file. We expect a .wic file that should be present in our official update packages	`{ "message": <String> }`

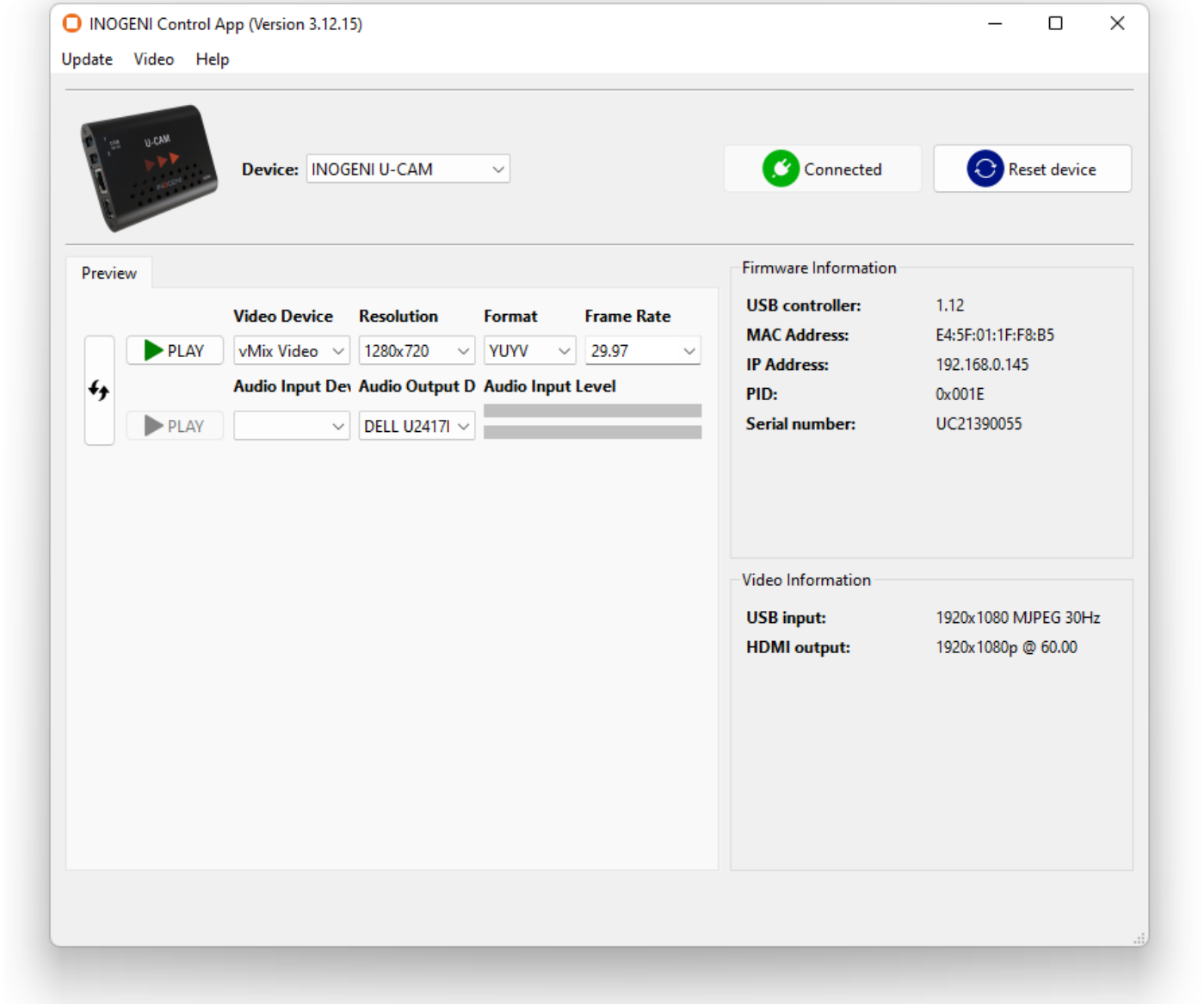
The bearer token is generated using a random process. The format of the bearer token only supports the following:

- Alphanumeric (`A` to `Z`) upper and lowercase characters.
- Numbers `0-9`.

INOGENI CONTROL APP

You can use our Control App to monitor firmware information, upgrade and configure your unit.

NOTE: You need to use the USB-B to USB-A cable provided with the box for the Control App to detect the unit.



SUPPORT

Engineered by video professionals, for video professionals, it is your most compatible USB 3.0 device. INOGENI expertise at your fingertips:

- **Expert Technical Support team** at support@inogeni.com for immediate help or if you have any technical question about our products.
- Extensive **Knowledge Base** to learn from other customers' experiences.

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CERTIFICATIONS

FCC Radio Frequency Interference Statement Warning
This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received including interference that may cause undesired operation.

IC Statement
This Class A digital apparatus complies with Canadian CAN ICES-3(A)/NMB-3(A).

CE Statement
We, INOGENI Inc., declare under our sole responsibility that U-CAM, to which this declaration relates, is in conformity with European Standards EN 55032, EN 55035, and RoHS Directive 2011/65/EU + 2015/863/EU.

UKCA Statement
This device is compliant with the Electromagnetic Compatibility Regulations 2016 No. 1091 as part of the requirements leading to the UKCA marking.

WEEE Statement
The European Union has established regulations for the collection and recycling of all waste electrical and electronic equipment (WEEE). Implementation of WEEE regulations may vary slightly by individual EU member states. Please check with your local and state government guidelines for safe disposal and recycling or contact your national WEEE recycling agency for more information.

RCM Statement
This device is compliant with Regulator Compliance Mark (RCM) certification.