



# PAL/NTSC H.264 Video Encoder



Composite Video To  
IP Encoded Video Converter



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## Document History

Version	Date	Change Summary
v1.00	25/07/2016	Initial Draft
v1.01	8/12/2016	WiFi & Recording Sections Added
v1.02	13/10/2017	Updates to support new software release
v1.03	15/01/2018	Updates for v3.6 release, TCP/UDP section
v1.04	17/07/2018	Updates for v3.20 firmware release
v1.05	5/10/2018	STA Mode additions
v2.00	18/08/2020	Updates to support v4.0 firmware release
v2.01	08/05/2024	Accessory Updates



## About the User Manual

This user manual describes the operation of the PAL/NTSC to H.264 Encoder.

As part of this, hardware interfacing, connections, viewing video and configuration of the module's functions are all described in detail.

Additionally the use of software control tools to view video are explained.

The guide follows a step by step approach, describing the simple initialisation sequence to get the user up and running in the shortest possible time.

This is followed up with a description of technical specifications and connector interfaces.

The VE part number for this manual is **110-3143**

## Warranty and Support

All Visual Engineering products are supplied as standard with a 12 month 'Return to Base' warranty.

**Please note: Any unauthorised product disassembly, modification or the removal of tamper proof labels will void the warranty.**

In the event of a suspected product failure, users should contact the Visual Engineering support team on the telephone number +44 (0) 1206 211842 or please email us at:

[support@visualengineering.co.uk](mailto:support@visualengineering.co.uk)

Should the fault persist or if the support team are unable to resolve the fault, it may be necessary to return the equipment.

Equipment should only be returned using the RMA (Returns Management Authorisation) process. Users should contact the support team on the above number and request an RMA number.



## Introduction

The encoder is a simple to use rugged in-line module that accepts PAL or NTSC composite video and outputs an H.264 IP stream. Together with the built-in microphone it provides a complete hardware solution to digitise SD video & audio and broadcast it as encoded H.264 or MJPEG.

The simple in-line design allows users to easily insert the module into existing systems using the cables supplied in the kit.

The resolution of the composite encoded video can be adjusted to be full, half or quarter resolution dependant on the available bandwidth. Adjustment of this and all other user parameters are controlled over the web browser interface.

Customers can tailor their requirements to fit the application through recording, Power over Ethernet (PoE) and WiFi add-on options.

With the inclusion of the WiFi option it allows the video stream to be viewed on a WiFi enabled hand held device. WiFi Access Point and Station modes are supported.

The recording option features secure micro SD card storage. Stored video files can be accessed by physically removing the SD card or over an Ethernet connection using either the [VE Camera Viewer](#) software or third party FTP transfer applications.

The encoder also supports control through the ONVIF protocol such that the encoder can be controlled by and viewed on ONVIF compliant [VMS platforms](#).

Dependant on configuration, the unit can be powered either by the DC power supply included in the kit or Class 0 Power over Ethernet.

It is housed in a CNC machined aluminium case to produce a unit that is very robust, reliable and suitable for professional use.



## Encoder Body Types

The encoder is available in two different body shapes. A Power over Ethernet type and a type that accepts DC power on the 8 way connector on the rear of the module. The two different body styles are shown below.



8 way Connector Body  
Part No: 110-8928



Power Over Ethernet  
RJ45 Connector Body  
Part No: 110-8944



## Part Numbers

Each encoder is fitted with a part number label. The label details the encoder's default IP address and its unique serial number. The part number of each encoder is explained in the table below.

Option	8 Way Connector Body	PoE Body
Standard	110-8928	110-8944
SD	110-8941	110-8945
WiFi	110-8942	110-8946
SD and WiFi	110-8943	110-8947



## The Video Encoder Kit



### Kit Contents with Part Numbers

The kit comes complete in a foam lined carry case, as shown above.

The full kit for the **8 way connector body** includes the following parts:

- Cat5e RJ45 to Binder Cable 110-8658
- BNC to Binder Cable 110-3899
- Passive PoE Injector Cable 110-8301
- Mains to DC Power Supply with Adaptors 110-8661
- USB Memory Stick 2GB 110-8679

The full kit for the **PoE connector body** includes the following parts:

- 1M Cat 5e RJ45 Cable 110-8644
- Encoder Breakout Cable 110-8932
- USB Memory Stick 2GB 110-8679



## Encoder Kit Contents



- PAL/NTSC H.264 Encoder



- BNC to Binder Cable



- 1m Ethernet camera cable, not included with PoE model



- DC insertion cable, not included with PoE model



- Power supply with adaptors, not included with PoE model



- USB memory stick, containing software applications and supporting documentation.





## Encoder Connections

The encoder has connections on both the front and rear. The rear connections differ dependant upon the body type.

The front connector is the same for both body types, the BNC to Binder cable should be connected at this point. The PAL or NTSC composite video source can be connected to the BNC connector.

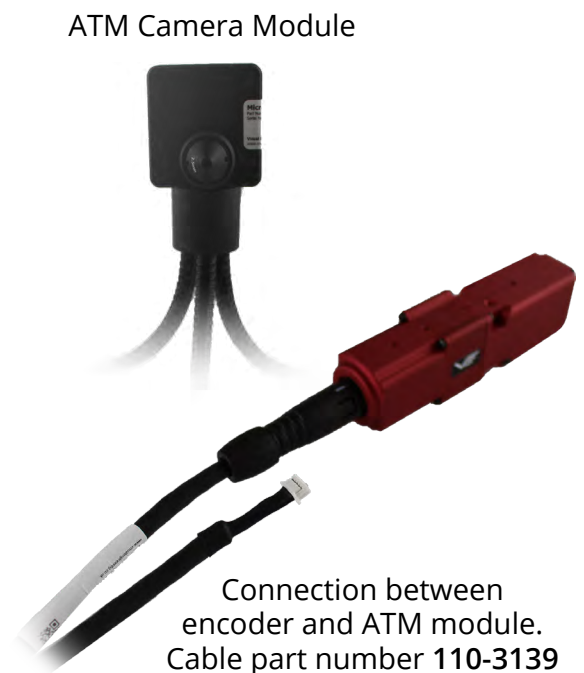
The image below shows an 8 way connector body type with connections made on the front and rear.



## Front Camera Connections

The encoder is capable of decoding PAL or NTSC analogue video and encoding this together with audio from the integral microphone into an IP stream. As such the encoder is compatible with many different cameras.

For a PTZ camera solution a recommended pairing would be to use either the Visual Engineering's SWZ or ATM camera modules.



## Rear Connection

The encoder decodes composite analogue video and audio and streams them as IP. Users therefore need access to a PC or similar networked enabled device to view the video from the connected encoder/camera combination.

Viewing the video and camera control can be accessed through the web browser interface, users will therefore need either Firefox, Internet Explorer or Chrome installed on their PC.

To view the streaming video from the camera users should have a video player installed onto their PC.

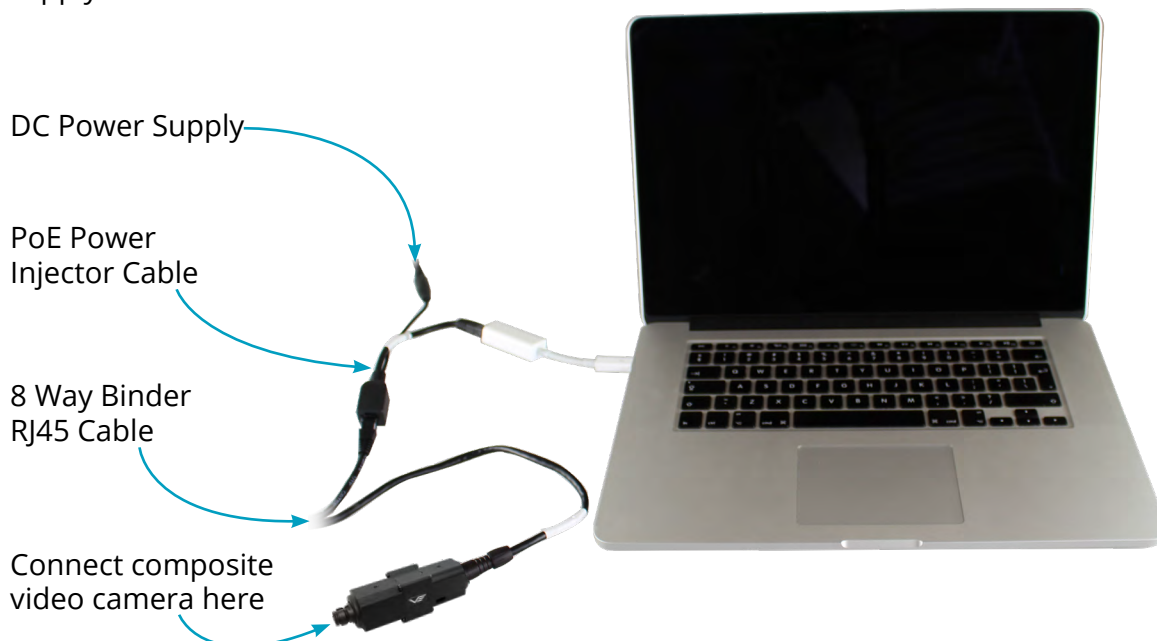
Visual Engineering recommends the use of the [VE Camera Viewer](#) to view the video.

Alternatively users can use VLC, this free media player that can be downloaded from:

[http://www.videolan.org/vlc/index.en\\_GB.html](http://www.videolan.org/vlc/index.en_GB.html)

## Cable Connections

The 8 way connector type encoder should be connected to a PC and power supply using the Ethernet and DC insertion cables as shown below. The DC adaptor should be connected to a mains supply.



The DC adaptor supplies the encoder and camera power plug with 12V DC. Alternatively, it can be operated with DC supplies from 6V to 18V. **Take careful note of the camera power requirements.**

The Power over Ethernet model must be connected to a network via a switch capable of Power over Ethernet type 0.



## PC Connection

Once the encoder is powered it is possible to view the encoder's video and configure the encoder's parameters over an IP connection to a PC.

The web browser control of the encoder allows the configuration of parameters such as resolution, bit rate, and network settings, once saved all configuration changes will be retained.

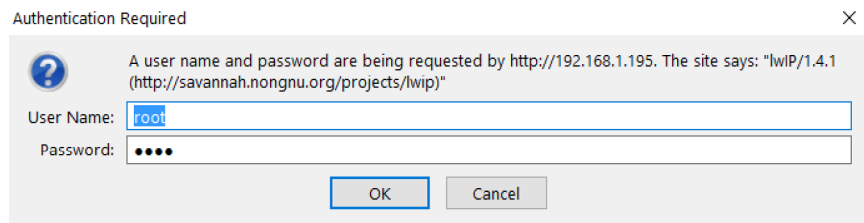
Browse to the encoder's web page by typing the encoder's IP address into the web browser address bar.

## Encoder Login

On trying to establish a connection the user will be prompted for the User Name and Password, enter the following details:

Default User Name is:  
**root**

Default Password is:  
**1234**



## Default IP Address

Encoders are by default set with a fixed IP address of **192.168.1.195**, this is detailed on the encoder's part number label.

If the encoder is not responding on this address it is possible that the IP address has been changed.

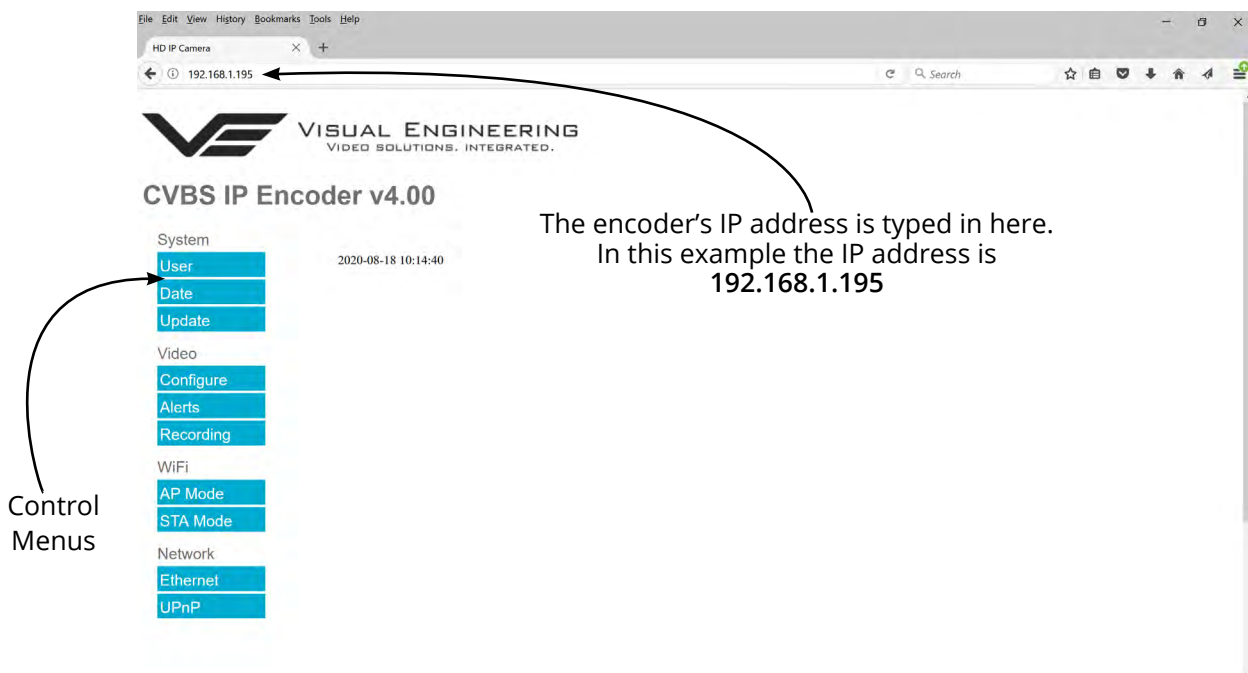
If the new IP address is unknown, the user can use the VE Camera Viewer software application to locate the IP address. This method is explained in the [VE Camera Viewer](#) section.

## Web Browser Control

The primary mechanism for configuring the encoder is its web browser interface.

The example screen below shows what is to be expected once a valid connection between the PC and encoder has been established by typing the encoder's IP address into the web browser address bar. In this example it is the default address of **192.168.1.195**

On the left side of the screen are the Control Menus which allow the user to configure various settings in the encoder. The functions of these menus are described in the following sections.



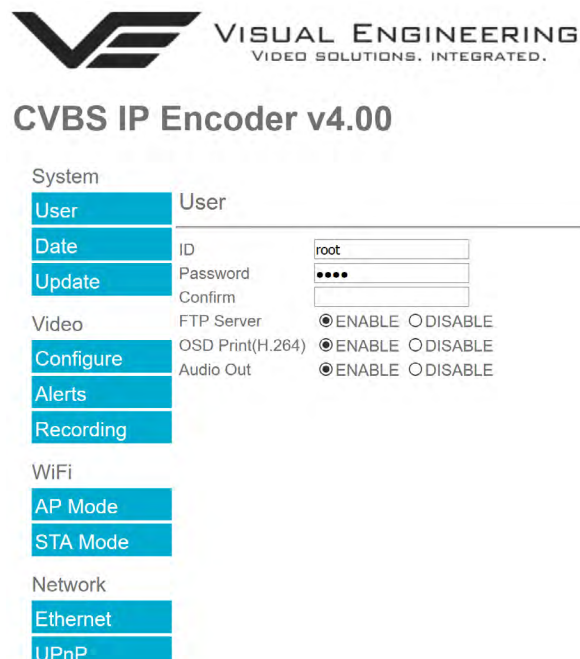
### User Menu

The user menu page allows users to configure the user ID and password of the encoder. It is necessary to confirm the password to change it.

There is also the option to enable/disable the following:

- FTP Server Connection
- OSD (On Screen Display)
- Audio Out

Changes are only enabled when the **submit** button is pressed.



## Date Menu

The date menu page allows the user to synchronise the encoder time to an SNTP server. In this instance it is necessary to have the PC connected to a network.

If a network connection is not available it is possible to synchronise the encoder to the PC time by ticking the "Sync Camera to PC Time" check box and pressing the **submit** button.

The "UTC Offset" can be altered to align the encoder time with the local time zone. Changes are only enabled when the **submit** button is pressed.

To align the encoder to the actual PC time the "UTC Offset" should be made same as the value displayed in the "PC UTC Offset" field.



## CVBS IP Encoder v4.00

System		
User	Date	<input type="button" value="submit"/>
Date	SNTP Server	<input type="text" value="0.uk.pool.ntp.org"/>
Update	Camera Time	<input type="text" value="2020-08-18 10:14:51"/>
	PC Time	<input type="text" value="2020-08-18 10:14:51"/>
Video	UpTime	<input type="text" value="18492 Days 08:14:51"/>
Configure	UTC Offset	<input type="text" value="2"/>
Alerts	PC UTC Offset	<input type="text" value="2"/>
Recording	Sync Camera to PC Time	<input type="checkbox"/>
WiFi		
AP Mode		
STA Mode		
Network		
Ethernet		
UPnP		

Tick this box and press **submit** to sync the encoder to the PC time

## Update Menu

It is possible to update the firmware of the encoder. There are three steps to updating the firmware, as shown on the right.

**!** Only update the encoder with files that have been approved by Visual Engineering. **!** Use of other files will render the encoder inoperable.



## CVBS IP Encoder v4.00

System		
User	Update	
Date	Firmware Download	<input type="button" value="Browse..."/> No file selected. <input type="button" value="Submit"/>
Update		<input type="button" value="Restore Defaults"/>
Video		
Configure		
Alerts		
Recording		<input type="button" value="Reset"/>

3. Submit the file

1. Select the Update tab

2. Browse to the file

Following a **Submit** the encoder will update the firmware and display the following text: Programming in Progress...Do not remove power Wait until the web page clears this text before trying to move away from the current web page or powering off the encoder. Updates typically take approx 3 minutes to complete.

**!** **Important:** To fully ensure the upgrade has finished it is advised to refresh the web page and check the banner displays "CVBS IP Encoder v4.00" or the encoder starts to once again stream video before switching off the power. It is advised that following a firmware update that the **Restore Defaults** button is pressed, this will revert the encoder back to a default start state. The IP address of the encoder will **revert** to its **default IP address of 192.168.1.195**

Pressing the **Reset** button will completely re-start the encoder.



## Video Menu

The Video Page is where the encoder's parameters can be configured.

The encoder supports two encoding formats, H.264 and MJPEG. The choice of the format is initiated by the user when the video stream is started.

To initiate a H.264 stream from an encoder with an IP address of 192.168.1.195 the URL is:  
**rtsp://192.168.1.195/h264**

To initiate an MJPEG stream from an encoder with an IP address of 192.168.1.195 the URL is:  
**rtsp://192.168.1.195/jpeg**

It is possible to change the Encoder Type to any one of the following options:

- HD IP Camera
- PAL Input
- NTSC Input
- Guardian Node
- SWZ HD Camera
- LVDS Input 25Hz
- LVDS Input 29.97Hz
- SDI Input 25Hz
- SDI Input 29.97

Changing the Encoder Type between PAL and NTSC and then pressing the **submit** button will display the message on the web page as shown here.

Once the message clears the encoder will be set to the new format.

**Ensure the connected video camera matches the Encoder Type.**



## CVBS IP Encoder v4.00

System

User Video Configure submit

Date	Decoder Type	PAL
Update	Resolution	720 x 576
	Max FPS	50

Video Encoder Type

Configure RTSP Port  (1 to 65535)

Alerts H.264 Resolution

Recording H.264 Quality  (0 to 51)

H.264 IDR Frame  (1 to 1800)

WiFi H.264 FPS

AP Mode Bitrate Control  Constant Bitrate  Constant Quality

STA Mode H.264 Bitrate

Network M-JPEG Resolution

Ethernet M-JPEG Quality  (0 to 63)

UPnP M-JPEG FPS

Bitrate Control  Constant Bitrate  Constant Quality

M-JPEG Bitrate



**PAL Input and NTSC Input are the only two valid Encoder Types for this device.**



Switch between the two types of input to match the connected video camera.



## CVBS IP Encoder v4.00

System

User Changing encoder type...

Date Ensure hardware matches!

Update

Video

Configure



The **RTSP Port** is the port number the IP video stream will be transmitted on, this has the default port number 554, which can be configured to another port number as required.

The encoder has two fundamental modes of operation:

- **Constant Bitrate.** This will output a constant bit rate IP video stream, as set in the Bitrate field.
- **Constant Quality.** In this mode the bit rate is varied in a effort to maintain a constant quality. The target quality is set using a number between 0 to 51, the lower the number the higher the quality, this is set in the quality field. Amendments to this value are only allowed when the constant quality mode is enabled. In this mode the 'ceiling' bit rate is controlled by the value set in the Bitrate field, the encoder will attempt to limit the maximum bit rate to this value.

### H.264 Resolution

Normally the encoder is viewed in full resolution, half and quarter resolutions are available if there is a restricted bandwidth connection.

### H.264 FPS (frames Per Second)

The maximum frame rate is 50fps, users may choose to select lower frame rates, thereby reducing the bandwidth required.

**H.264 IDR Frame** changes to the I frame interval balances the stream's quality against latency, the lower the number the lower the latency. Lower latency however can incur picture degradation due to the effect of limiting the decoder buffer.

### Video Frame Preview

It is possible to view a single still image from the connected camera via a web browser using the following URL format:

<http://192.168.1.195/still.jpg>

The above URL is applicable when the encoder is set to its default IP address.



## Example Settings

The bit rate of the IP stream can be adjusted to suit the system bandwidth available. Changes to the resolution and frame rate will adjust the stream's bit rate. The following table shows example bit rates for particular resolution and frame rate values.

Typical Bitrate	Resolution	Frame Rate	H.264 Quality
4.2 Mb/s	Full	50	20
1.2 Mb/s	Full	50	30
500 Kb/s	Full	10	30
1.8 Mb/s	1/2	50	20
500 Kb/s	1/2	50	30
200 Kb/s	1/2	10	30
800 Kb/s	1/4	50	20
250 Kb/s	1/4	50	30
100 Kb/s	1/4	10	30





## Alert Control

Motion and light level triggers can be configured such that an audible tone and a visual alarm alerts the viewer.

These controls can also be set using the [VE Camera Viewer](#)

Motion and dark to light level triggers can be used to trigger an OSD (On Screen Display) event. For this to occur users should ensure that the OSD Print option in the [User Menu](#) is enabled.

The level of motion required to invoke a trigger can be set with the Trigger Sensitivity between: Off, Low, Mid or High.

The duration of the alarm event will be the duration of the motion event plus the time set in the Trigger Duration field, values from 0 to 100 seconds are valid.

Users should press the **submit** button to enable any changes.



## CVBS IP Encoder v4.00

### System

User	Alert Control	<input type="button" value="submit"/>
Date	Motion Sensitivity	<input checked="" type="radio"/> Off <input type="radio"/> Low <input type="radio"/> Mid <input type="radio"/> High
Update	Trigger Duration	<input type="text" value="10"/> Secs (0 to 100)

### Video

- Configure
- Alerts
- Recording

### WiFi

- AP Mode
- STA Mode

### Network

- Ethernet
- UPnP

Triggered OSD Alerts





## Ethernet Menu

Network parameters can be set on the encoder by selecting the Ethernet menu.

The encoder can operate with a fixed IP address, or can be allocated an IP address from the network, these modes are controlled using the DHCP button enable/disable.

Users should press the **submit** button to enable changes.



## CVBS IP Encoder v4.00

### System

User	Ethernet		submit
Date	IP Address	<input type="text" value="192.168.1.195"/>	
Update	Subnet Mask	<input type="text" value="255.255.255.0"/>	
	Default Gateway	<input type="text" value="192.168.1.1"/>	
	Primary DNS Server	<input type="text" value="210.94.0.73"/>	
	Secondary DNS Server	<input type="text" value="211.33.40.5"/>	
	Use DHCP Server	<input type="radio"/> ENABLE <input checked="" type="radio"/> DISABLE	
	HTTP Ports	<input type="text" value="80"/>	

### WiFi

AP Mode
STA Mode

### Network

Ethernet
UPnP

## HTTP Ports

The default HTTP port and ONVIF HTTP port to control and configure the encoder is 80.

Selecting one of the five options as shown in the drop down box on the right will set both the HTTP port and ONVIF HTTP port number.

Moving the encoder's HTTP port number should only be carried out by users confident of keeping a track on what settings have been applied to the encoder.

Setting a new IP address and new HTTP port simultaneously should be avoided.

Following changes.....users should press the **submit** button to enable changes.



## CVBS IP Encoder v4.00

### System

User	Ethernet		submit
Date	IP Address	<input type="text" value="192.168.1.195"/>	
Update	Subnet Mask	<input type="text" value="255.255.255.0"/>	
	Default Gateway	<input type="text" value="192.168.1.1"/>	
	Primary DNS Server	<input type="text" value="210.94.0.73"/>	
	Secondary DNS Server	<input type="text" value="211.33.40.5"/>	
	Use DHCP Server	<input type="radio"/> ENABLE <input checked="" type="radio"/> DISABLE	
	HTTP Ports	<input type="text" value="80"/>	

### WiFi

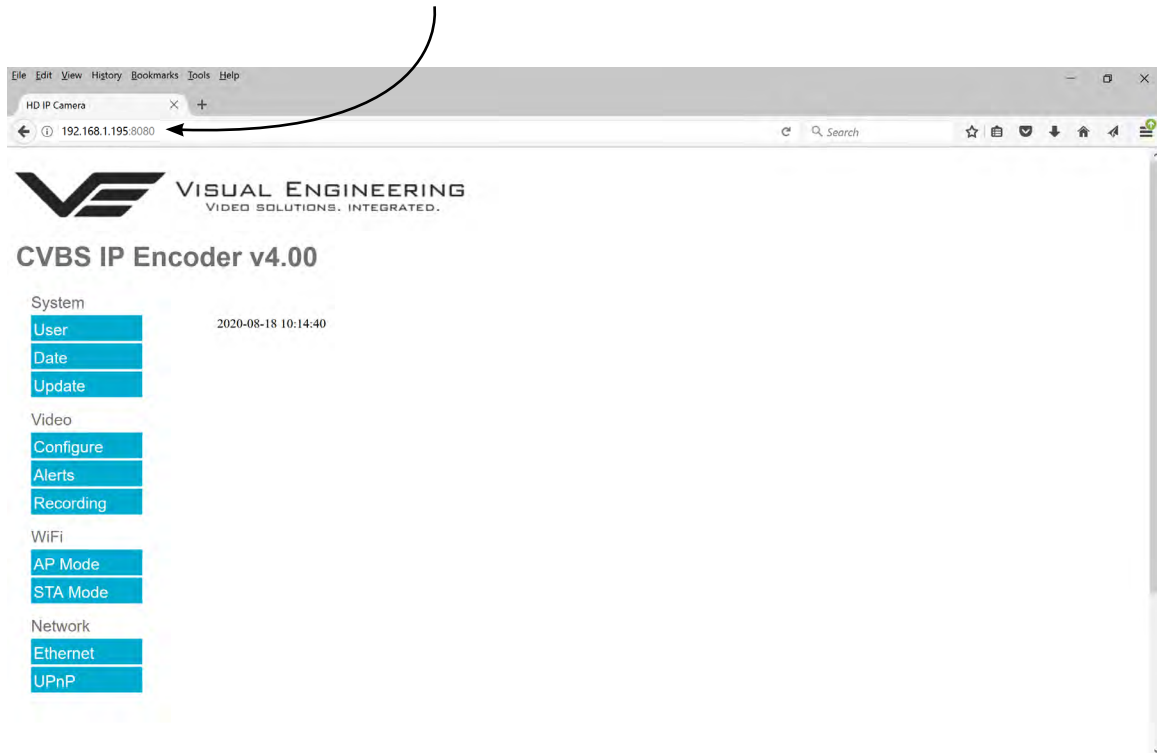
AP Mode
STA Mode

### Network

Ethernet
UPnP

Once an encoder has been set to a new port or IP address the web browser will be automatically re-directed to the encoder's new URL.

In the example shown below the encoder has been set to an IP address of 192.168.1.195 and port 8080. This extended URL format should be used to address encoders reconfigured to a HTTP port number which is not the default number of 80.



## Unreachable Encoders

If an encoder has been set to an unknown IP address it can be found by using the [VE Camera Viewer](#) this will find any encoder's IP address regardless of the IP subnet.

If unsure which port the encoder has been configured to run a VMS software tool such as the ONVIF Device Manager. More information on VMS tools can be found in the [Video Management System](#) section.



## UPnP Menu

The Universal plug and play menu allows the user to set the Device ID and Camera Name.

Users should press the **submit** button to enable changes.



## CVBS IP Encoder v4.00

### System

User	UPnP		<input type="button" value="submit"/>
Date	Device ID	<input type="text" value="VE_195"/>	
Update	Camera Name	<input type="text" value="VE_30P_FHD"/>	

### Video

- 
- 
- 

### WiFi

- 
- 

### Network

- 
-



## WiFi Menu

For WiFi capability to be available the encoder must have the WiFi option included.

The WiFi module requires the WiFi antenna to be connected to the SMA connector on the top of the encoder as shown on the right.



## AP Mode Menu

The encoder has an integrated WiFi Adaptor which supports its own WiFi access point. Using any WiFi enabled device it is possible to connect to the encoder to monitor its video and audio.

The WiFi user configurable settings can be found in the WiFi Setup menu. The AP Mode WiFi menu allows the user to configure the WiFi access point settings, this is shown in the web page below along with a short description of the key parameters.



## CVBS IP Encoder v4.00

### System

User	WiFi AP Mode Control		submit
Date	Switch	<input checked="" type="radio"/> ON <input type="radio"/> OFF	• Enable or disable the WiFi Access Point
Update	SSID	<input type="text" value="VE_WIFI_CAM"/>	• The encoder's WiFi Access Point name
	Channel	<input type="text" value="CH.13 [2.472Ghz]"/>	• WiFi channel, select one of 13 channels
Video	Max STA Count	<input type="text" value="5"/>	• Max number of stations (devices) allowed on the network
Configure	WiFi AP Mode Security		
Alerts	Authentication	<input type="radio"/> Open <input checked="" type="radio"/> WPA2-PSK	• Encryption standard, choose either open or WPA2-PSK
Recording	Network Key	<input type="text" value="12345678"/>	• User configurable network password
	Server IP	<input type="text" value="192.168.15.1"/>	• User configurable IP address of the WiFi access point: To connect to the camera via WiFi the "Server IP" should be used in the client browser to view the video
WiFi	WiFi AP Mode DHCP		
AP Mode			
STA Mode			
Network	Default Gateway	<input type="text" value="192.168.15.1"/>	
	Start IP Address	<input type="text" value="192.168.15.2"/>	
Ethernet	End IP Address	<input type="text" value="192.168.15.254"/>	
	Subnet Mask	<input type="text" value="255.255.255.0"/>	
UPnP	Lease Time	<input type="text" value="864000"/>	

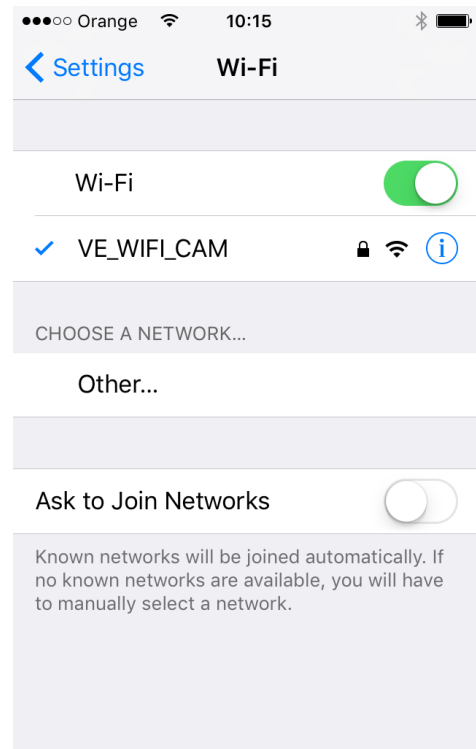


## Connecting a WiFi Device

To connect a WiFi enabled device it is first necessary to search for the encoder's WiFi signal.

Select the VE\_WIFI\_CAM signal as shown on the right.

If prompted for a network key enter the Network Key as defined in the AP Mode Security section, the default is:  
**12345678**

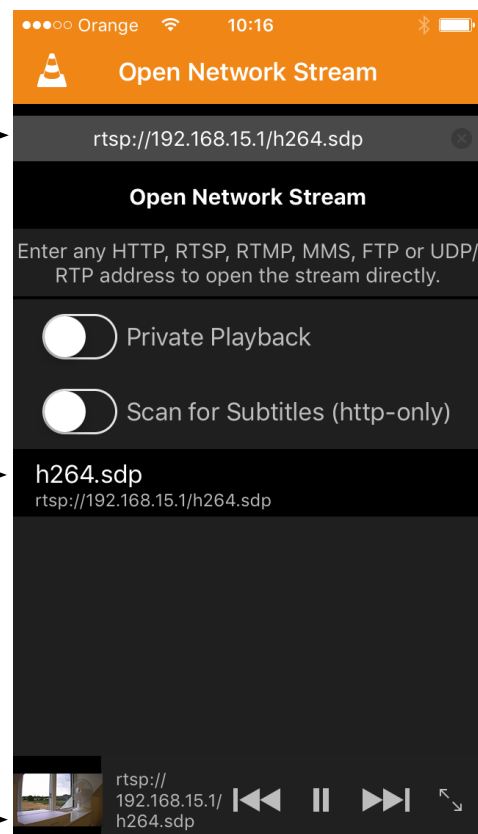


## Open a WiFi Video Stream

It is necessary to have a video player application installed on the WiFi enabled device. In the example shown on the right VLC media player has been installed.

Use the Server IP address of the WiFi Adaptor and open an SDP media stream.

- Type the stream details into the box at the top **rtsp://192.168.15.1/h264.sdp**
- Select the stream here
- Select the video panel for full screen viewing





## STA Mode Menu

The STA Mode WiFi sub-menu allows the user to configure the WiFi adaptor in station mode. This can be achieved by following the four steps as described on the right of the STA Mode web page shown below. Following any changes made the user must press the **submit** button. The encoder will then save any changed parameters. Wait until the encoder finishes re-configuring before trying to move away from the current web page or powering off the encoder.



## CVBS IP Encoder v4.00

### System

User	WiFi STA Mode Control <span style="float: right;">submit</span>	
Date	Switch	<input checked="" type="radio"/> ON <input type="radio"/> OFF ← 1. Set the switch to ON
Update	SSID List	MseC2412 <input type="button" value="Scan"/> ← 2. Click Scan & select the network from the populated drop down list
Video	Authentication	WPA2-PSK-CCMP
Configure	Password	sysfo_e ← 3. Enter login details
Alerts	Connect	<input checked="" type="radio"/> Connect <input type="radio"/> Disconnect ← 4. Select Connect
Recording	State	<input type="text"/>
WiFi	WiFi STA Mode DHCP	
AP Mode	DHCP Client	<input checked="" type="radio"/> ON <input type="radio"/> OFF
STA Mode	IP Address	192.168.1.102
Network	Subnet Mask	255.255.255.0
Ethernet	Default Gateway	192.168.1.1
UPnP	Primary DNS Server	192.168.1.1
	Secondary DNS Server	211.33.40.5

If required, a static IP address may be used by setting "Use DHCP Client" to OFF.

Once the encoder is connected in STA Mode the web page control and video stream will be forwarded to the IP Address as shown in the DHCP Client section. For the example shown above this would be 192.168.1.102

In most cases it is possible to view the video feed and control the encoder on this STA Mode IP Address and also on the encoder's IP Address as defined in the Ethernet Menu. In certain network configurations it has been observed that the encoder may not respond to its Ethernet IP Address once STA Mode is connected. If this is found to be the case use the STA Mode IP Address (192.168.1.102 in this case) to gain back control of the encoder and view the video feed.

If the STA Mode is disconnected on a web page using the STA Mode IP Address it will be observed that there is no web page confirmation of task and further control will be lost on that particular IP Address.



## Recording Menu

For recording to be available the encoder must have the recording option included. If this option is included the encoder will be fitted with a 32GByte micro SD card, which is located beneath a cover plate. For access to the SD card, remove the two T5 screws, cover plate and gasket.



The SD Card has a capacity of 32GBytes, this offers 17 hours of continuous recording at a total IP bit stream of 4Mb/s or 34 hours at 2Mb/s, etc. If recording capacity is achieved there is a user option to either stop recording or overwrite. The recording web page menu is shown below.

**Note:** Recording is temporarily paused during activity on the camera's web interface.

## Timed Recording

There are 4 options for timed recordings, these are; Off, Continuous, Once and Daily.

Off = No recording takes place.

Continuous = Recording Continuously.

Once = Record once when the start time is reached and record for the set duration.

Daily = Record daily starting when the start time is reached and record for the set duration.



## CVBS IP Encoder v4.00

System	
User	Timed Recording <span style="float: right;">submit</span>
Date	Mode <input checked="" type="radio"/> Off <input type="radio"/> Continuous <input type="radio"/> Once <input type="radio"/> Daily
Update	Start Time <input type="text" value="00"/> : <input type="text" value="00"/>
	Duration <input type="text" value="00"/> : <input type="text" value="00"/>
Video	
Configure	Trigger Recording
Alerts	Motion Trigger <input checked="" type="radio"/> Disable <input type="radio"/> Enable
Recording	Light Trigger <input checked="" type="radio"/> Disable <input type="radio"/> Enable
WiFi	
AP Mode	Overwrite Control
STA Mode	<input checked="" type="radio"/> Recording will stop when SD card is full
	<input type="radio"/> Oldest video will be overwritten when the SD card is full
Network	
Ethernet	Erase and format the SD Card <span style="float: right;">Erase</span>
UPnP	





## Trigger Recording

Trigger Recordings can be triggered by either motion or light level change. Trigger recordings are disabled by default, if enabled, a recording will be made. The duration of the recording will be the duration of the motion event plus the time set in seconds in the trigger duration.

## SD Card Management

In the event of the SD card becoming full, there are two options for Overwrite Control. One option is to have the recordings stop when the SD card is full, or the other option is to have the oldest material to be overwritten when the SD card becomes full.

Following any changes made in the menu the user must press the **submit** button . Wait until the camera finishes re-configuring before powering off the camera.

## Erase and Format

The SD card will be completely erased and formatted if the **Erase** button is used. The user will be asked to confirm that this is the intention before the SD card memory card is actually erased.



## Recovering Recordings

### Record Format

Recordings are stored on the SD Card as individual 10 second duration .avi files. This is for a frame rate of 30fps, lower frame rates will increase the length of the stored file proportionately. For example a frame rate of 15fps will create a 20 second video clip.

Video clip lengths are kept intentionally kept short, this allows integration with the [VE Camera Viewer](#) so that recent events can be played back with a low data upload overhead.

The file size is proportional to the total bit rate selected by the user.

The files follow the a naming convention of:

YYMMDDHHNNSS

For example a file with the name of: 170801134611 would have the meaning:

YY = Year is 2017

MM = Month is 08, August

DD = Date is 01, the 1st of the month

HH = Hour is 13, 24 hour format

NN = Minutes is 46

SS = Seconds is 11

Recordings are stored in directories for each individual hour, the directory has the form:  
YYMMDDHH

Since each file a minimum of 10 seconds long there will only ever be a maximum of 360 files in each directory.

Recordings can be accessed and downloaded via FTP (File Transfer Protocol) using either the [VE Camera Viewer](#) or an FTP application such as FileZilla.

The VE Camera Viewer is available to download from the VE website at:

[www.visualengineering.co.uk/supportdownload/26](http://www.visualengineering.co.uk/supportdownload/26)

FileZilla is a free application and can be downloaded from

<http://sourceforge.net/projects/FileZilla/>

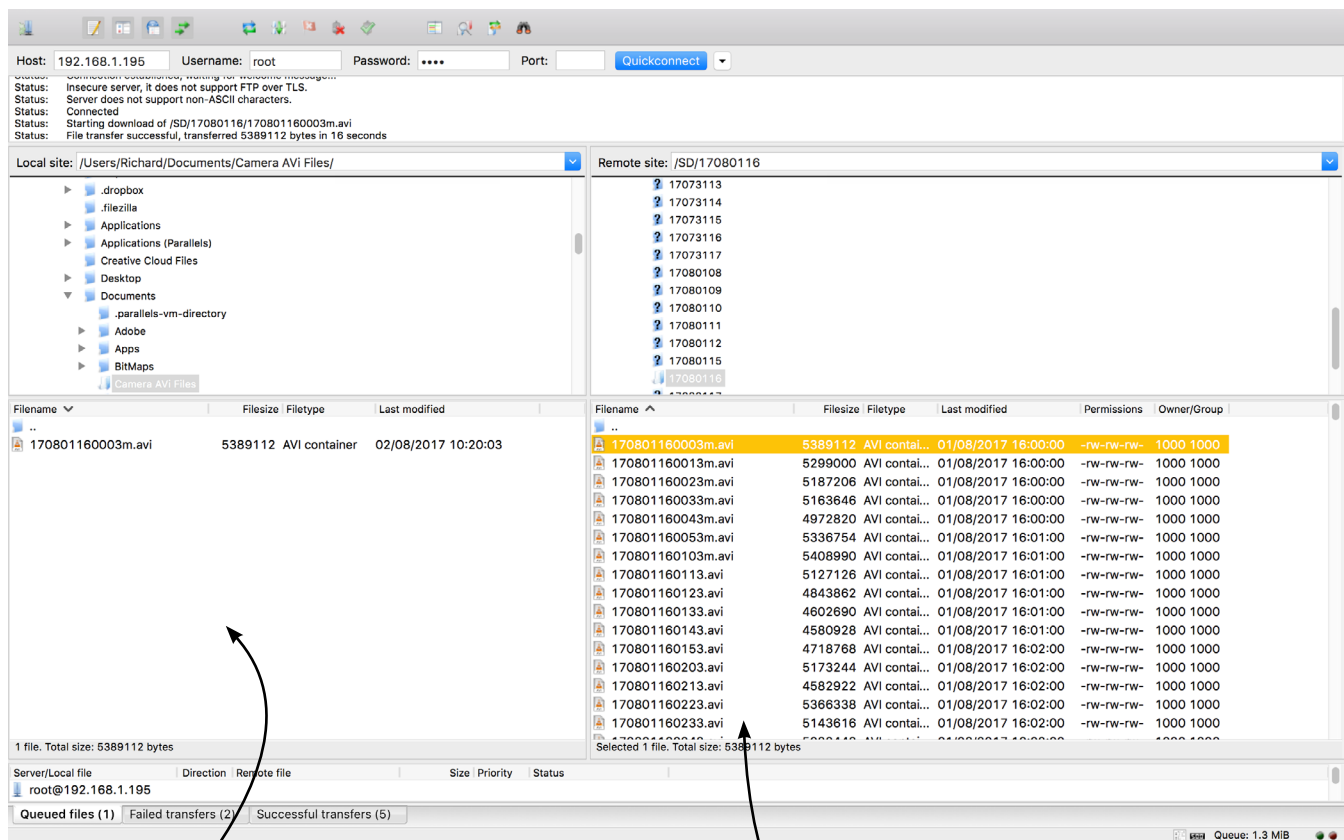
If using FileZilla, downloaded recordings can be played in players such as VLC either individually by selecting Play stored File or in groups by creating a play list.

## Using FileZilla

With FileZilla downloaded, installed and running it will appear as shown below.

Set the Host = Encoder default IP Address of **192.168.1.195** is shown here  
 Username = The encoder's default username is **root**  
 Password = The encoder's default password is **1234**

Then press 'Quickconnect'



Files can be dragged across to the location selected on the local computer

File structure on the SD card of the encoder

Recordings on the encoder will be stored in the directory structure: **SD/YMMDDHH/** as shown above. Individual files can then be selected and downloaded or dragged across to the storage location selected on the local computer.

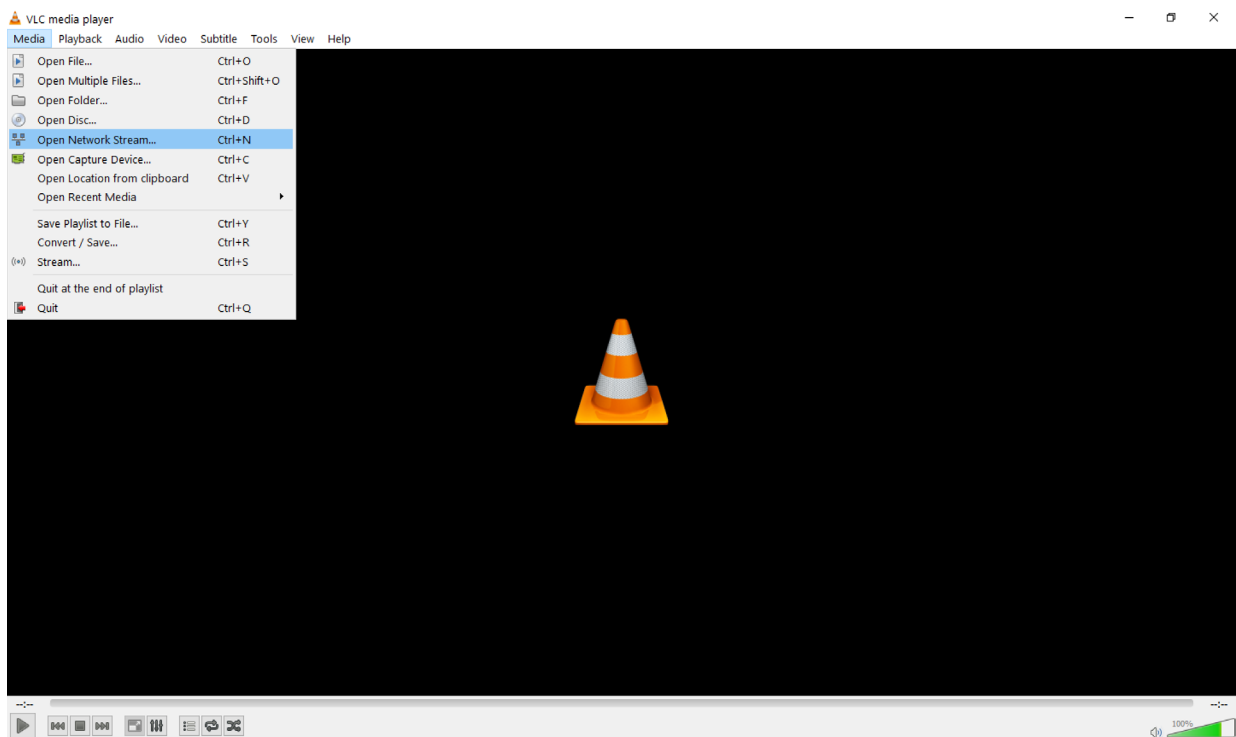
## Using VLC to Play Streams

The encoder is compatible with many players, a simple freeware player is VLC Media Player. Users should download VLC Media Player and run the application.

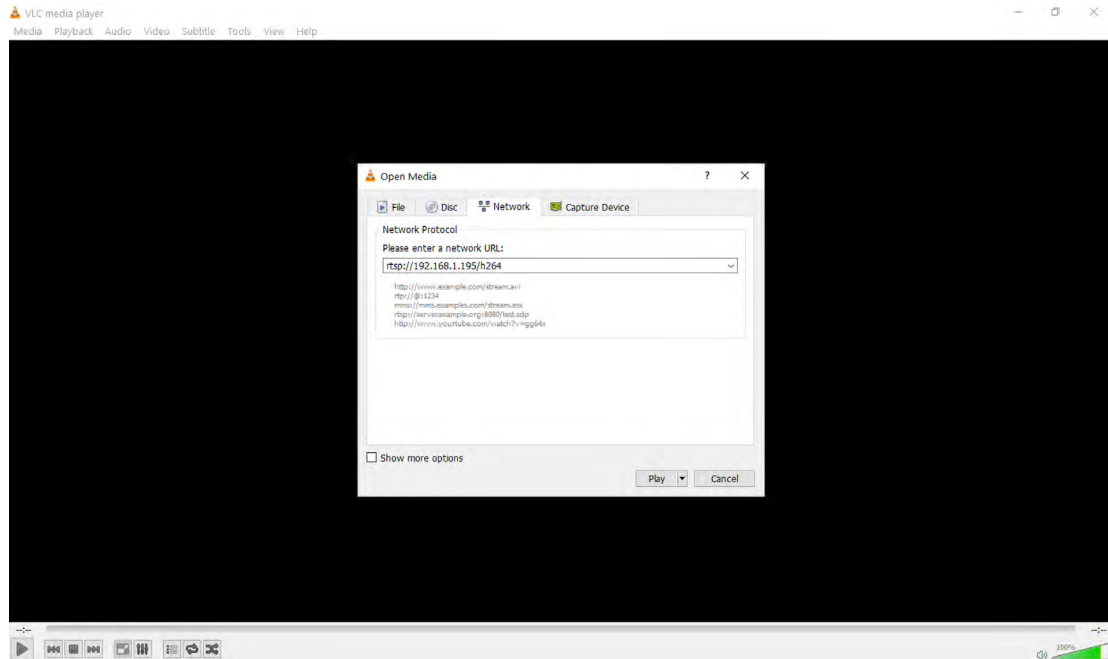
VLC is a free media player and can be downloaded from:

[http://www.videolan.org/vlc/index.en\\_GB.html](http://www.videolan.org/vlc/index.en_GB.html)

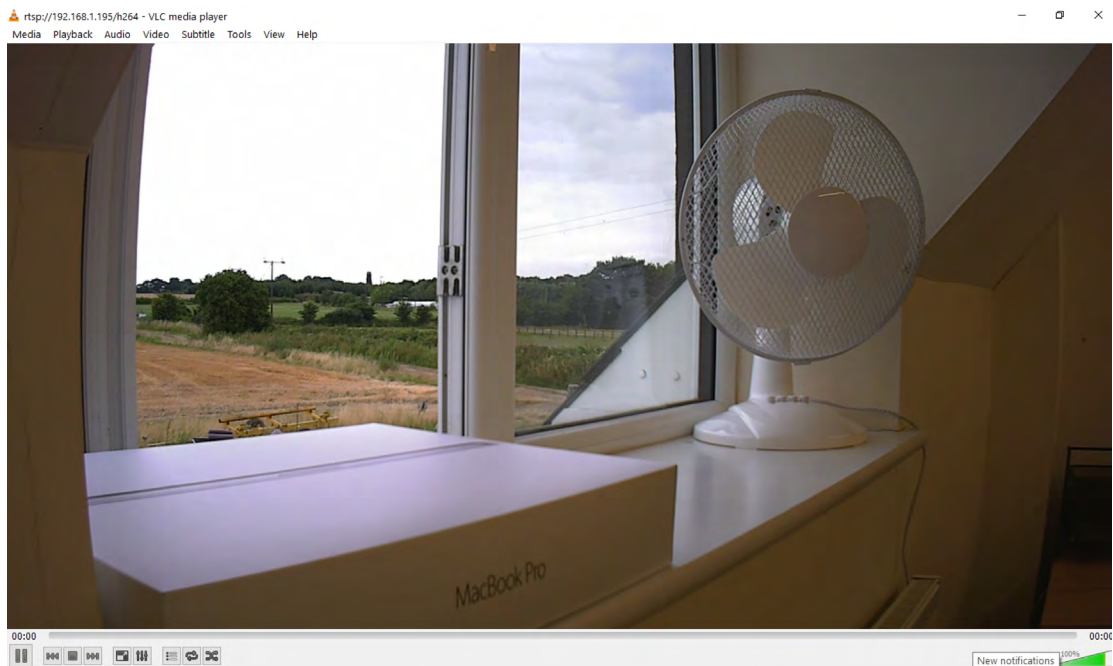
- Enable the VLC Media Player application.
- From the Media menu select the 'Open Network Stream' as shown below.



- Enter the encoder URL and stream type, eg: `rtsp://192.168.1.199/h264`  
The URL depends upon the IP address of the encoder and the stream type, eg: h264 or jpeg. This is shown below



- Press play and wait for a few seconds, the video stream will appear.



## The VE Camera Viewer

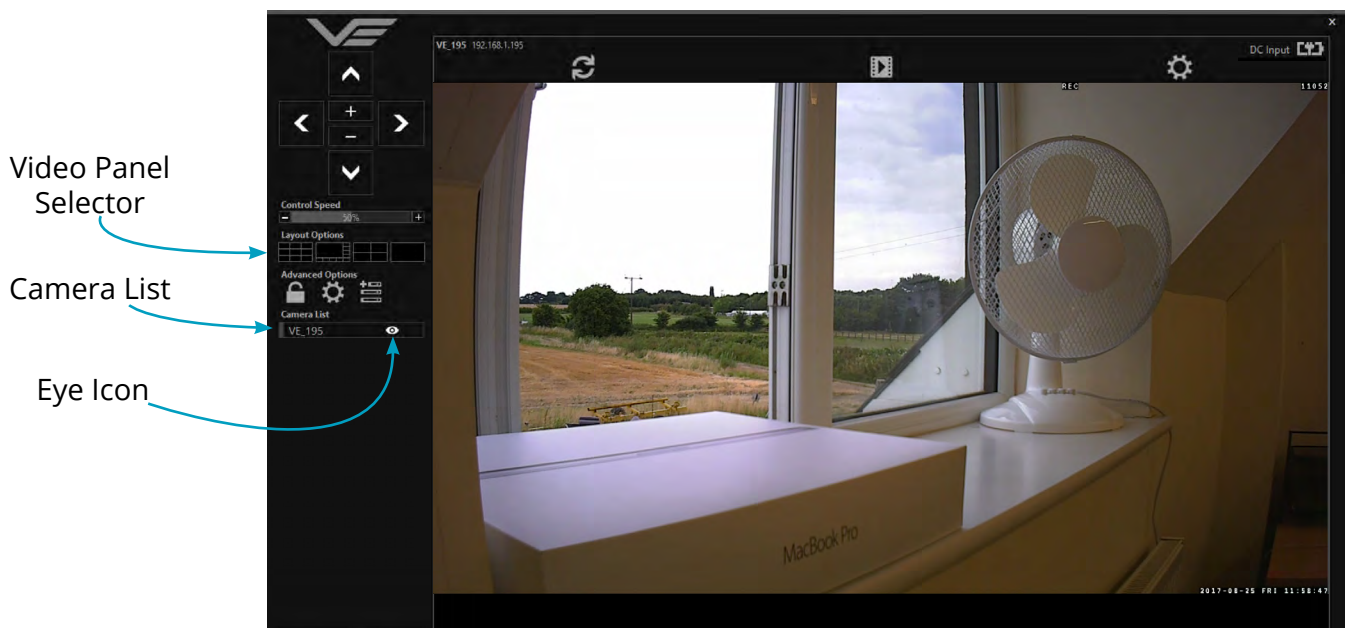
The VE Camera Viewer is a software application used to display the video from all video sources in the system. It will auto detect any VE cameras and encoders that are on the network and populate a list on the left hand side of the player.

The VE Camera Viewer software can be downloaded from the VE website support page or from the memory stick provided in the kit.

[www.visualengineering.co.uk/supportdownload/26](http://www.visualengineering.co.uk/supportdownload/26)

### Viewing Video

The VE Camera Viewer is intuitive and simple to use. Any encoder on the network will be displayed in a list on the left hand side of the player. The video can be viewed by clicking the "Eye Icon" next to its name. The video panel selector can be used to select how the video panels are arranged, this is useful when several video feeds are in the system.



### Video Panel Options

The top of the video panel displays information on the playback mode of the displayed video. In the above instance the video playback is a Live stream, it can also be noted that the encoder is currently recording since the REC icon is shown. Since the encoder camera does not contain an integrated battery the power source will be displayed as a DC input.

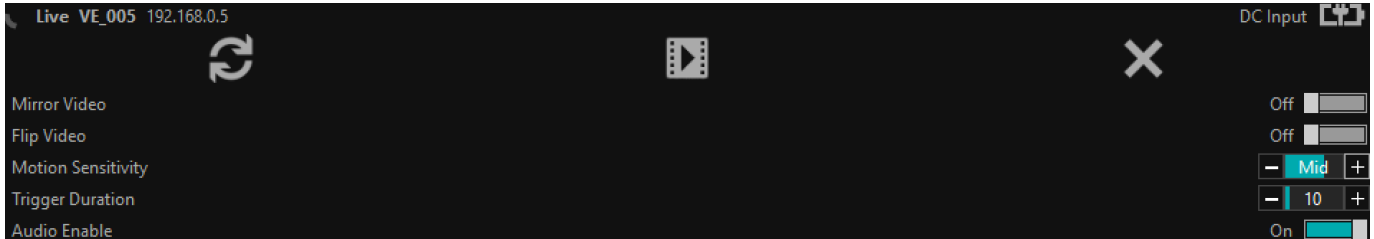


If the mouse is hovered between the video panel and the above information the player will offer the user the three options, Refresh the video session, Play a Recording or edit the Settings.



## Settings

- The encoder does not support the Flip Video or Mirror Video options
- The Motion Sensitivity can also be set to: Off, Low, Mid or High
- The Trigger Duration sets the alarm time (in secs) following the end of the triggered event
- The audio can be enabled and disabled as required



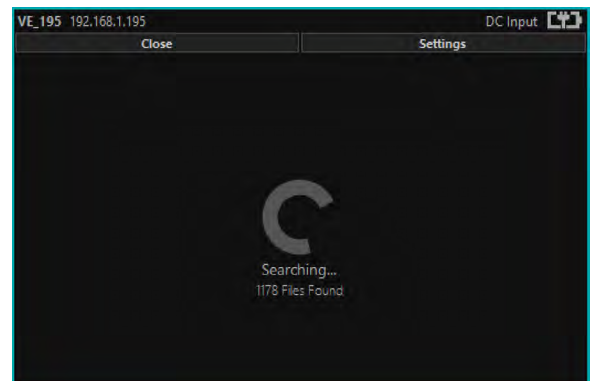
## Play Recordings

Recordings will only be available if the encoder is fitted with the recording option.

If the Play Recording option is selected the player will allow the user to select a recording to playback.



The player will find all available files that are stored on the SD card in the encoder. The update screen as shown on the right will be displayed until all files are discovered.



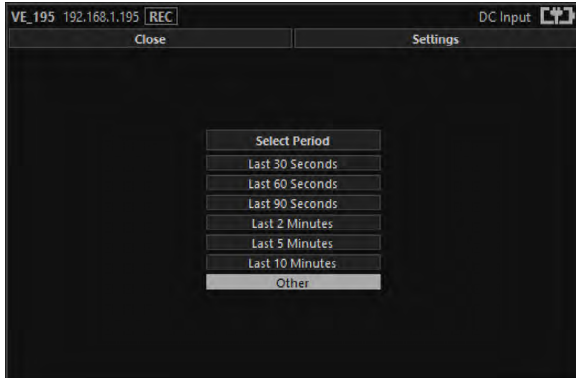
Users can then select a segment of recorded video to be played back from memory. Options are from 30 seconds to 10 minutes.

The full range of download periods is only available in advanced mode.

To access the advanced mode the user needs to hold keyboard keys "A", "D", and "V" then click on the padlock icon next to the Advanced User text.



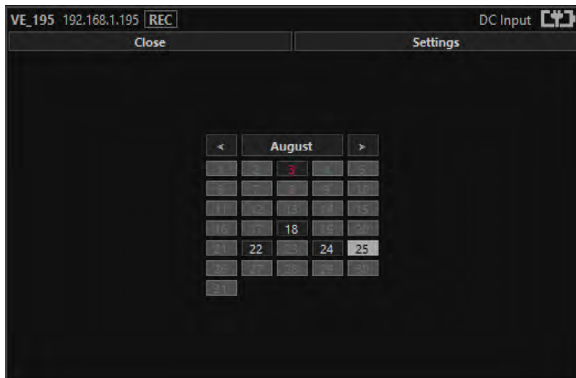
Select "Other" to choose a specific period of timed recording.



Select the required month, months that don't hold recordings are greyed out.



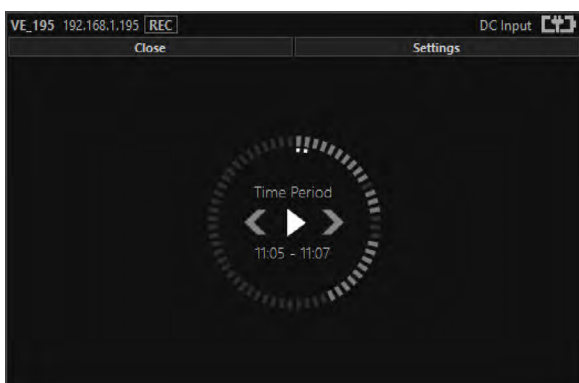
Select the required date, days that don't hold recordings are greyed out.



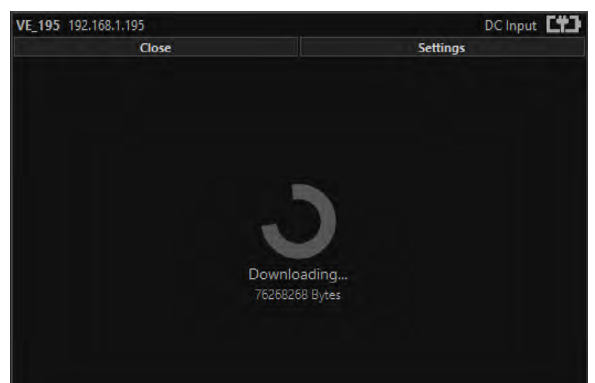
Select the required hour of day, hours that don't hold recordings are greyed out.



Select the required start and end time from the time dial. Press the play icon.



The files will then be downloaded, after which time the video recording can be viewed in the video panel.







## Video Panel Coloured Border

The video panel is edged in a colour, the meaning of which is described in the following table.

Video Panel Edge Colour	Meaning
Red	A trigger alarm has occurred
Blue	The panel has been selected for Pan Tilt Zoom Control
Grey	No trigger alarms & not selected for PTZ Control

## Trigger Alarms

The trigger alarms are enabled either via the player or the web interface. Once a trigger event occurs it will be displayed and sounded in the player. The video panel will have a red edge border and an icon will be shown in the bottom left corner. The trigger icon is either a motion trigger or a low to high light level change as described in the table below.

Trigger Icon	Trigger Source
	A low light level to high light level transition has been detected.
	Motion has been detected in the video.

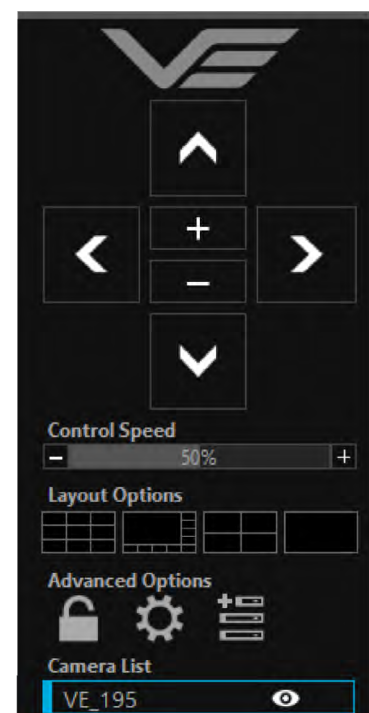
## Pan, Tilt & Zoom Control

Select a camera from the Camera List, this will cause the selected camera description being edged in blue, as shown on the right. The video panel for the camera will also be edged in blue.

- Pan Control: left & right arrows
- Tilt Control: up & down arrows
- Zoom in: + symbol
- Zoom out: - symbol

## Advanced User

To access the advanced mode, which allows full access to the stored recordings, the user needs to hold keyboard keys "A", "D", and "V" then click on the padlock icon next to the Advanced User text.



Selecting the centre settings icon allows access to several player settings including:

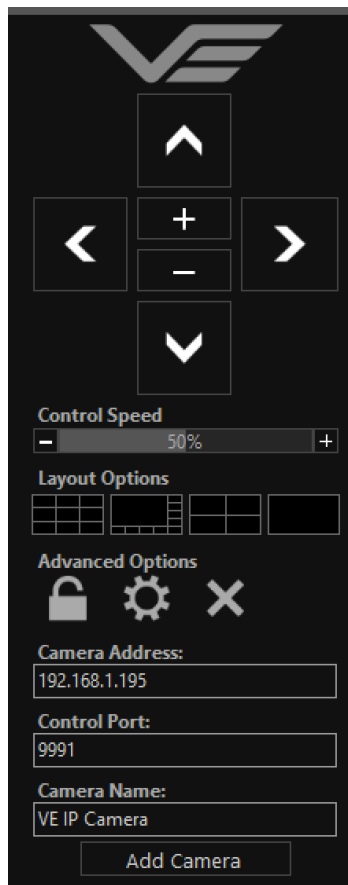
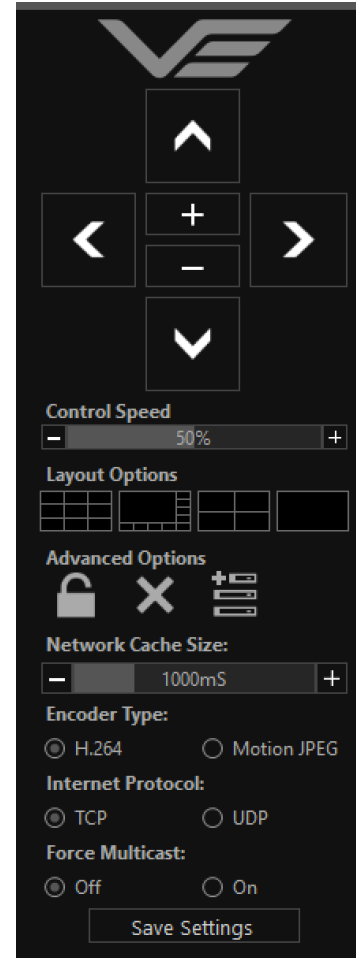
- Network Cache Size
- Encoder Type
- Internet Protocol
- Multicast

Increasing the Network Cache Size will cause the player to cache more data before streaming video. Decreasing this value will result in the latency of the video stream being reduced, values below 350mS are not recommended.

The encoder is capable of transmitting H.264 and MJPEG video streams, select the preferred stream to be viewed.

The video stream packets can be sent over TCP or UDP, select the preferred transport method. More information on these methods is described in the [TCP Vs UDP](#) section.

Select Multicast to On sends a request to the encoder to send a multicast video stream. Currently the encoder does not support multicast streaming.



Selecting the right hand side icon allows the user to manually add a camera or encoder by IP address.

Adjustment to the TCP/IP control port and camera name settings can also be made.

## Multiple Viewing

### Multiple Viewers

It is possible to connect multiple instances of a video player to a single encoder.

There is however a maximum limit at which the encoder bit rate can be set to whilst streaming video to multiple viewers using the unicast method of transmission. Bit rates set to a value greater than the allowed maximum value for a given number of clients will result in video breakup.

With the encoder set to constant bit rate mode, the table below describes the maximum bit rate the encoder can be set to for a given number of connected viewing clients using the unicast method of network transmission.

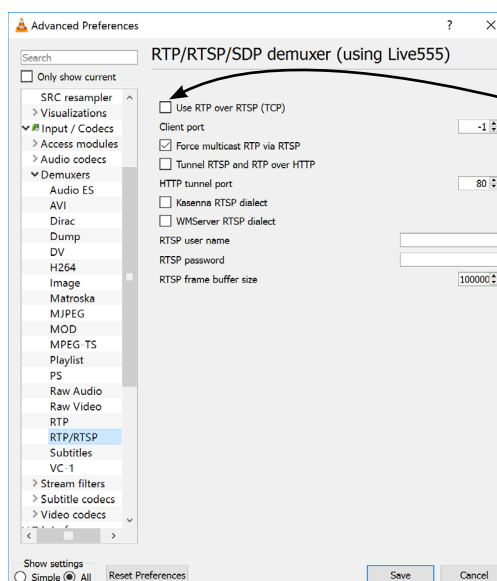
Client Count	Maximum Camera Bit rate
1	10Mb/sec
2	8Mb/sec
3	6Mb/sec
4	4Mb/sec

## TCP Vs UDP

The encoder is capable of transmitting a video stream over either UDP or TCP transmission protocols. The benefits of each protocol is particular to the specific deployment of the encoder. In general terms UDP is a more efficient method which carries less overhead than TCP but lacks some reliability as not all video frames are required to be received in full.

For example, if the encoder is used in a scenario where the video is being monitored in real time and the stream is being sent across an RF link that is susceptible to break up, UDP would be the best choice. The reason for this is that re-sending any missed video packets using the TCP method will result in out of date video frames being reconstructed, which will ultimately result in an increase to the video latency.

### TCP/UDP in VLC



If this checkbox is ticked VLC will request that the camera sends video packets over TCP, otherwise it will request that the camera sends video packets over UDP.

## ONVIF

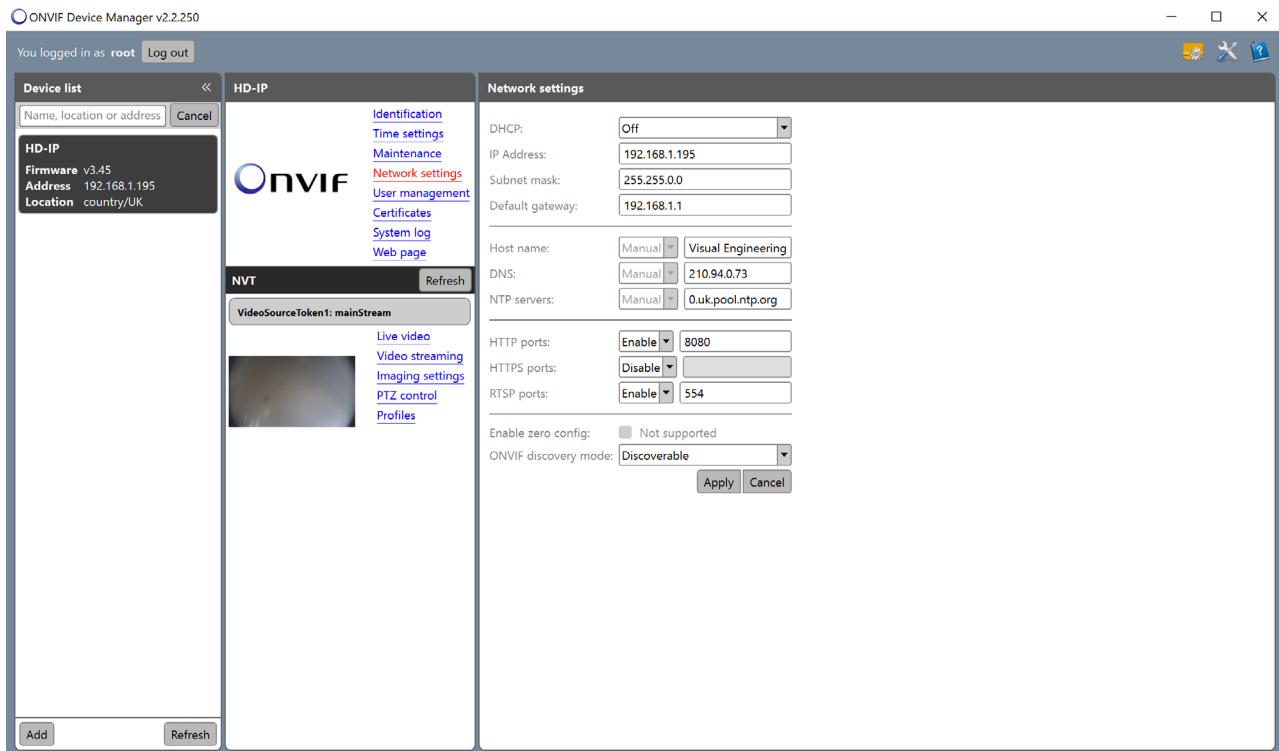
### Video Management Systems

The encoder supports the ONVIF protocol such that it can be controlled and viewed on ONVIF compliant VMS platforms such as the ONVIF Device Manager, Milestone and Airship.

ONVIF Device Manager is available as a free download available here:

<https://sourceforge.net/projects/onvifdm/>

The software will locate cameras and encoders on the network. Click the Network settings tab to display the port that the encoder is currently configured to. In the example shown below encoder's port is set to 8080, therefore the encoder's URL is 192.168.1.195:8080



If the controlling PC and encoder are on separate IP subnets and the encoder's IP address is unknown run the [VE Camera Viewer](#) application, which will find the IP address of the encoder.

## Control Across The Internet

### Port Forwarding

It is possible to control the encoder and view its video remotely through an internet connection. One way of achieving this is through port forwarding on a router that is connected to the internet and also connected to the encoder.

As many internet enabled routers are capable of providing this gateway, the settings and control interface will differ dependant on manufacturer and model.

The example below shows a router's NAT/PAT (Network Address Translation/Port Address Translation) configured to forward port 8080 (the HTTP port) and port 554 (the RTSP port) of the camera which has an IP address of 192.168.1.194

Both of these ports can be configured in the encoder through the following encoder web pages:

- The HTTP port can be configured in the [Ethernet Menu](#)
- The RTSP port can be configured in the [Video Menu](#)




### NAT/PAT settings

these rules are needed to authorise a remote communication from Internet to reach a specific device of your LAN. you can also define the ports(s) that this communication will use.

**NB: following rules are only applied with IPv4.**



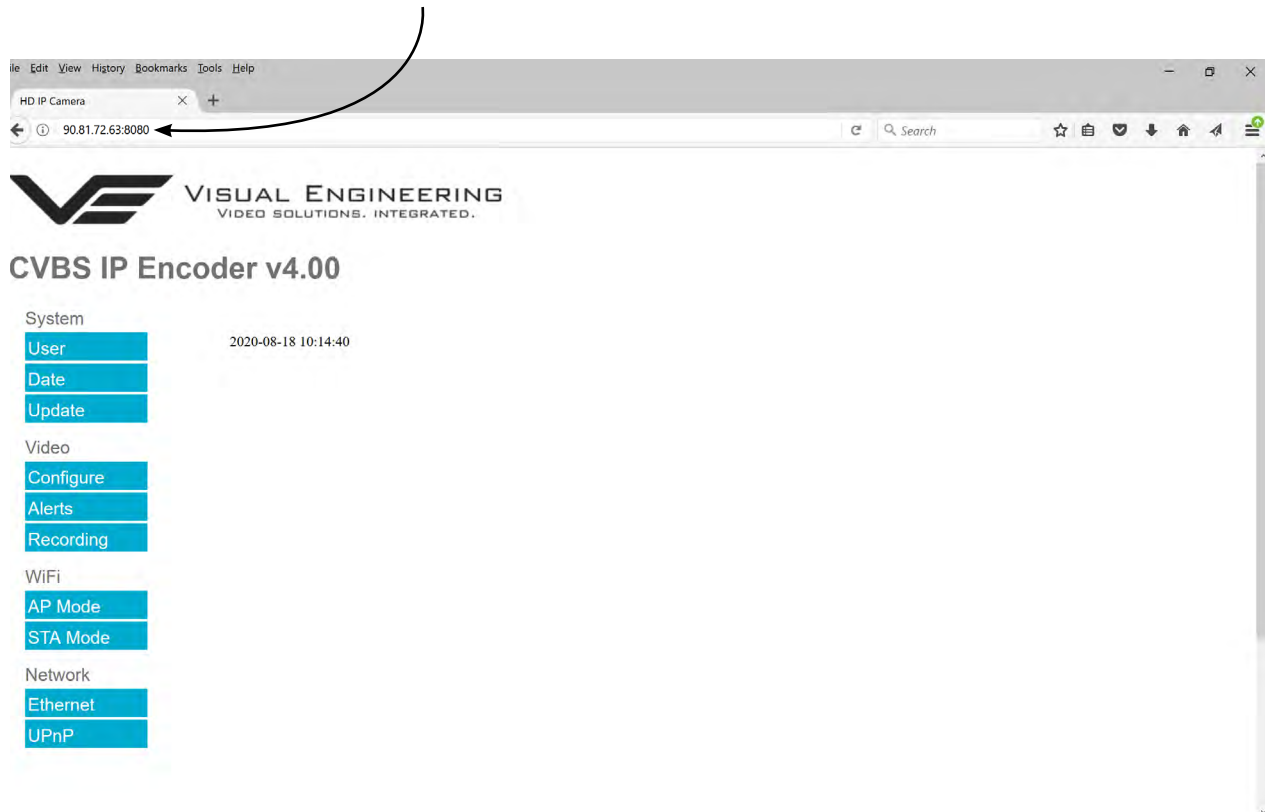
warning : make sure you have not filtered these ports in the firewall.

customize rules						
application / service	internal port	external port	protocol	device	activate	
Camera H 	<input type="text" value="8080"/>	<input type="text" value="8080"/>	TCP 	<input type="text" value="192.168.1.194"/> 		<input type="button" value="save"/>
HD IP Camera	554	554	both	192.168.1.194	<input checked="" type="checkbox"/>	<input type="button" value="delete"/>
Camera HTTP	8080	8080	TCP	192.168.1.194	<input checked="" type="checkbox"/>	<input type="button" value="delete"/>



## Remote Configuration

Access to the remote encoder's web pages are addressed by using the gateway IP address of the router along with the HTTP camera port that has been forwarded.



## Remote Video Streaming

To stream the encoder's video across the internet a URL similar to the ones described below should be used.

- `rtsp://90.81.72.63:554/h264`
- `rtsp://90.81.72.63:554/jpeg`

In the above URL examples the internet router's gateway IP address (90.81.72.63) and the encoder's RTSP port (554) should be substituted where relevant.

Ensure that the video bit rate of the encoder is matched to the available connection capacity.



## Connector Interfaces

### 8 Way Connector Body

#### 8 Way Binder Male on Rear

Mating half is Binder 99-9226-00-08.

1. +12v
2. GND
3. Eth TX+
4. Eth TX-
5. Eth RX+
6. Eth RX-
7. TXD (from unit, debug path)
8. RXD (to unit, debug path)

### PoE Connector Body

#### RJ45 Female on Rear

Mating half is male RJ45.

PoE is auto between Modes A & B, hence power can appear on different pins dependant upon which mode the power injector supports.

	Mode A	Mode B
1. Eth TX+ PoE+		
2. Eth TX- PoE+		
3. Eth RX+ PoE-		
4.	NC	PoE+
5.	NC	PoE+
6. Eth RX- PoE-		
7.	NC	PoE-
8.	NC	PoE-

### Both Body Types

#### 8 Way Binder Female on Front

Mating half is Binder 99-9225-00-08

1. +12v
2. GND
3. CVBS
4. Video GND
5. RS232 RX (Data into Encoder)
6. RS232 TX (Data from Encoder)
7. GPIO1
8. GPIO2



## Specifications

Specifications			
<b>Input Video</b>	PAL or NTSC	<b>VMS Compliance</b>	ONVIF
<b>Video Resolutions</b>	Full, 1/2, 1/4	<b>Optional WiFi</b>	2.4GHz
<b>Video Encoding</b>	H.264 Compression BP @ Level 4.1 MJPEG Dual Streaming	<b>Input Voltage</b>	5 to 16V DC
<b>Audio Encoding</b>	G711	<b>Power Consumption</b>	1.4W If WiFi is Added +0.9W to 1.2W (Range Dependant)
<b>Microphone</b>	Voice band silicon omni	<b>Temperature</b>	-20 to +50°C
<b>Max Bit Rate</b>	10Mb/s	<b>Environmental</b>	IP67 (8 Way Connector Body)
<b>Streaming Protocol</b>	RTSP over TCP or UDP	<b>Weight</b>	52g
<b>Optional Storage</b>	32GB micro SD Card	<b>Dimensions</b>	82.5 x 25 x 20mm

### Visual Engineering Technologies LTD

Kemps Farm  
Stanway  
Colchester  
Essex  
CO3 8NB  
UK



Product specifications subject to change without notice

**Tel:** +44 (0)1206 211842  
**Web:** [www.visualengineering.co.uk](http://www.visualengineering.co.uk)  
**Email:** [sales@visualengineering.co.uk](mailto:sales@visualengineering.co.uk)