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Revision 1.0

AEON Camera Control HEVC Transmitter User Guide

Commercial in Confidence

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0. Preface

0.1 About this Document

This document contains relevant information required to identify, install and control the equipment or system.

Since the available functions can be licensed and depend on the specific implementation, not all the functions and or applications contained in this document may be relevant or applicable to the system.

The actual presentation may differ from those in this document due to hardware or software changes.

0.2 Intended Audience

This document is for anyone interested in how the system can be used, but it is of most benefit to:

- Operators who are in charge of the daily operation of the equipment
- Installers who are responsible for the pre-installation, on-site installation and configuration of the system in the end-user environment.
- Maintainers who are responsible for maintaining the equipment or system

0.3 Notice about this Publication

While DTC makes every attempt to maintain the accuracy of the information contained in its product manuals, the information is subject to change without notice.

Performance specifications included in this manual are included for guidance. All particulars are given by DTC in good faith, actual performance may vary.

0.4 Text Conventions

This document uses these conventions to identify text that has a special meaning:

Description	Example
Text in capitals represents a key press on a keyboard. The + sign means hold down the first key while pressing the second key.	ESC, F1, SHIFT CTRL+C
<*Text*> Serves as a placeholder for variable text that is replaced as appropriate, the text may be written in italics.	Use the filename <*system_name*>.sys for…
Text in italics can represent a link to a place in the existing document (often these are hyperlinks) or a reference to another document.	Refer to *Section 0.4*, *Text Conventions*.
Text in **bold** emphasises a term of significance.	We call this a **protocol** and its function is…
Successive software menu selections are shown using arrows to indicate sub-menus. This is often shown in bold.	Select **Configuration>Global** then edit…

0.5 Symbols

These symbols are used to highlight important information.

WARNING: A notice of when a situation may result in personal injury or loss of life, or destruction of equipment.

CAUTION: A notice of when a situation may result in loss of data or damage to equipment or systems.

Note: A notice to draw attention to something or to supply additional information.

0.6 Trademarks

All trademarks or registered trademarks that appear in this document are the property of their respective owners.

0.7 Related Documents

All DTC documents can be downloaded from WatchDox. See *Section 9.1*.

VideoSys user guides can be downloaded from their website:

https://videosys.tv/files/Videosys%20Products/Camera%20Control/Guides/

Document	Source
SOLO Concept Guide	DTC
IP Concept Guide	DTC
PRORXD Receiver HEVC Decoder User Guide	DTC
Camera Control User Guides	VideoSys Broadcast

0.8 Document History

This is a controlled document, written and produced by the DTC Technical Publications team. Changes are recorded in the table below.

Revision	Date	Author	Summary of Changes
1.0	20/11/2019	IR	First release

Contents

1. Product Overview

1.1 Description

AEON-CC is a compact COFDM digital video transmitter with integrated camera control, specifically designed for high quality wireless link applications. With proven Domo COFDM and next generation HEVC encoder technology at its core enabling Ultra High Definition images the small size and actively cooled enclosure give maximum operational performance.

Designed to offer future proof connectivity, the unit supports native 12G-SDI, dual 6G-SDI, quad 3G-SDI. Two true balanced audio inputs are included with phantom power. The transmitter has an integrated control panel with IP based control.

The HEVC codec used in AEON products offers a step change in compression efficiency over H.264 systems, whilst maintaining low end to end latency suitable for live events.

1.2 Features

- Ultra-low latency HEVC SD, HD and 4K encoding
- Video formats up to 2160p60, 10-bit and 4:2:2 chroma sampling, future HDR support
- Industry standard DVB-T modulation for interoperability with existing systems
- Domo Broadcast UMVL modulation for enhanced high frequency/high speed performance
- Controlled via IP or integrated sunlight-readable LCD display
- Available as V-mount, AB-mount or no battery mount options
- Designed for sports & events coverage, newsgathering and wireless studio camera applications
- Low power consumption and active cooling for extended field performance
- Integrated camera control for wide range of supported manufacturers

1.3 Basic Specifications

Dimensions	166mm x 97mm x 48mm
Weight	1.15kg
DC Input	10.6V to 17.8V reverse polarity protected
Power consumption	39W average
Temperature range	-10°C to +50°C

Note: Detailed technical specifications are given in the product datasheet. Please see http://www.domotactical.com/ or contact the DTC representative.

2. Product Package

2.1 Overview

Carefully open the packaging and the remove the device and all other items. Verify that all the components have been included in the package as shown in the packing list. Inspect for shipping damage.

Note: If there are missing parts or the condition of the equipment is not satisfactory, please call DTC for support. See *Section 9.2*.

Retain the packing list and all the packing materials for storage.

The codes in the packing list mean:

- CA – cable assembly
- SA – sub assembly
- AP – assembly part

The part numbers are useful for identification and if a new part is needed.

2.2 Parts List

These items will be in the package.

Part Number	Description
Primary unit	Camera Control HEVC Transmitter (frequency will depend on variant)
AP008822	Antenna 433MHz, flexi SMA
CA0579	Audio cable, 5-way circular to 3-way XLR x2
CA3348 x 4	Video cable, HD-BNC to UHD-BNC

2.3 Accessory Options

If any of these items have been purchased, they will also be in the package.

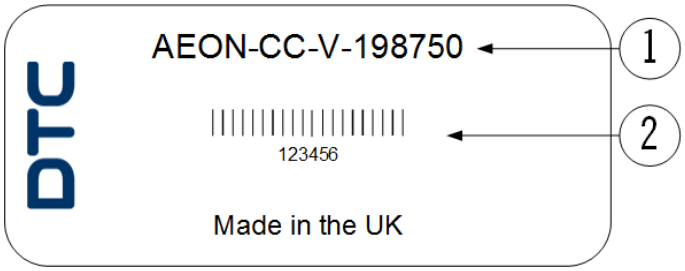
Part Number	Description
CA3421	4-way OB circular connection for 15V 6.0A 90W desktop PSU
VS-CCCAM-GV-UP	Grass Valley control fitted to AEON-CC
VS-CCCAM-HIT-UP	Hitachi control fitted to AEON-CC
VS-CCCAM-IKE-UP	Ikegami control fitted to AEON-CC
VS-CCCAM-PAN-UP	Panasonic control fitted to AEON-CC plus 30cm cable
VS-CCCAM-SON-UP	Sony control fitted to AEON-CC plus 30cm cable
PRORXD-8-2RU-AEON	4K Professional HEVC Receiver and Decoder

2.4 Variants

This part number will identify the product; it is also on the label.

Part Number	Description
AEON-CC-V-198270	AEON Camera Control 1.98-2.70GHz, V-Mount
AEON-CC-V-300370	AEON Camera Control 3.00-3.70GHz, V-Mount
AEON-CC-V-440500	AEON Camera Control 4.40-5.00GHz, V-Mount
AEON-CC-V-640700	AEON Camera Control 6.40-7.00GHz, V-Mount
AEON-CC-V-700750	AEON Camera Control 7.00-7.50GHz, V-Mount

2.5 Labelling



No.	Description
1	Part number – this is the variant explained above.
2	A barcoded, six-digit serial number. This may be required during a support call.

2.6 Licensing Options

Some product functions are enabled by licenses. The current licenses can be viewed in the control software.

Part Number	Description
Platinum (included)	DVB-T, Ultra Mobile Video Link (UMVL), Dual Pedestal, Single 4K, Quad HD Encoder
LIC-AEON-PSF	PSF Video Formats

3. Connections and Controls

3.1 Introduction

This chapter will help identify all the connections and interfaces of the product needed to install, control and monitor the device.

3.2 Bottom Panel

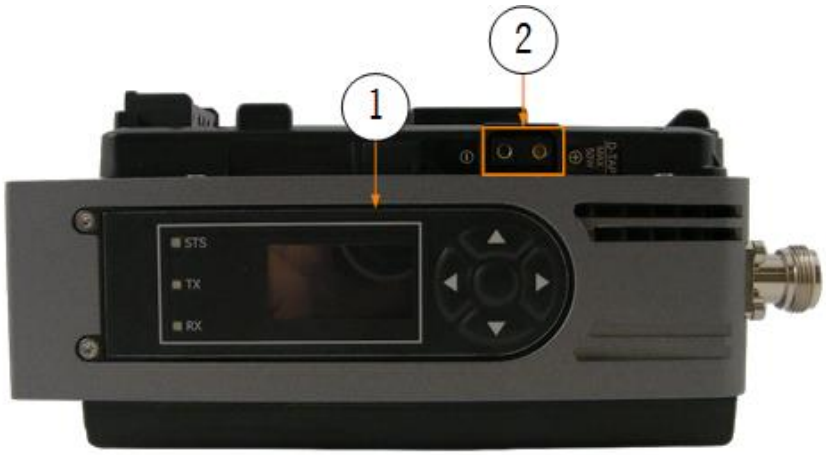
Note: See *Section 3.6* for pinout.

No.	Item	Connection
1	RJ45 jack	Labelled **Eth-1**, connect to a PC to control the internal encoder module using a web browser application.
2	RJ45 jack	Labelled **Eth-0**, connect to a PC to control the internal camera control module using a web browser application.
3	5-way circular (sockets)	Balanced analogue or digital audio input. The supplied CA0579 audio cable will adapt to 2x XLR connections.
4	4-way circular (sockets)	10.6V to 17.8V power input. The optional CA3421 desktop PSU will supply 15V power input.
5	10-way circular (pins)	Supplies data and power to the camera module.
6	HD BNC (socket) x 4	SDI video input 1-4. The supplied CA3348 cables will adapt the HD-BNC connectors to UHD BNC. Input **1** supports **12G-SDI**, **6G-SDI** and **3G-SDI** Input **2** supports **3G-SDI** only. Input **3** supports **6G-SDI** and **3G-SDI** Input **4** supports **3G-SDI** only

3.3 Top Panel

No.	Item	Connection
1	N-type jack (socket)	Connect a COFDM transmit antenna, matched to the frequency band of the device, for RF power out.
2	SMA jack (socket)	The supplied antenna (AP008822) connects here to receive camera control signals.

3.4 Right Panel



No.	Item	Connection
1	OLED display	The OLED display, controls and indicators are covered in detail in *Chapter 5*.
2	D-tap supply	This terminal can tap up to 50W of power from the battery for auxiliary use.

3.5 Left Panel

On the left panel is a 5-way circular jack (sockets) labelled **TALLY**. This can connect to a tally light used to indicate that the camera is live.

Note: See *Section 3.6* for pinout.

3.6 Pinout

3.6.1 Power

Lemo EEG.0B.304.CLL single key

Pin	Function
1	VIN
2	VIN
3	GND
4	GND

3.6.2 Audio

Lemo EEA.0B.305.CLL twin key

Pin	Function
1	AUD_IN_L+
2	AUD_IN_L-
3	GND
4	AUD_IN_R+
5	AUD_IN_R-

3.6.3 TALLY

Lemo 5 EGG.0B.305.CLL single key

Pin	Function
1	GND
2	VBATT OUT
3	RED
4	GREEN
5	N/C

4. Getting Started

4.1 Introduction

This chapter will help the user power up the AEON-CC and will explain the options for control and monitoring.

4.2 Power

There is no power switch, the AEON-CC will start the moment the power supply is connected.

Power can be supplied to the AEON-CC in two ways:

- Via an AB or V mount battery, depending on the battery mounting plate
- Via a 10.6–17.8VDC input to the power connector on the bottom panel

4.3 OLED Control

The preferred method of control of an AEON-CC is via the OLED control or web GUI front panel emulation.

The OLED display and control buttons on the AEON-CC right panel, provides control and monitoring when being operated in the field or there is no access to a PC.

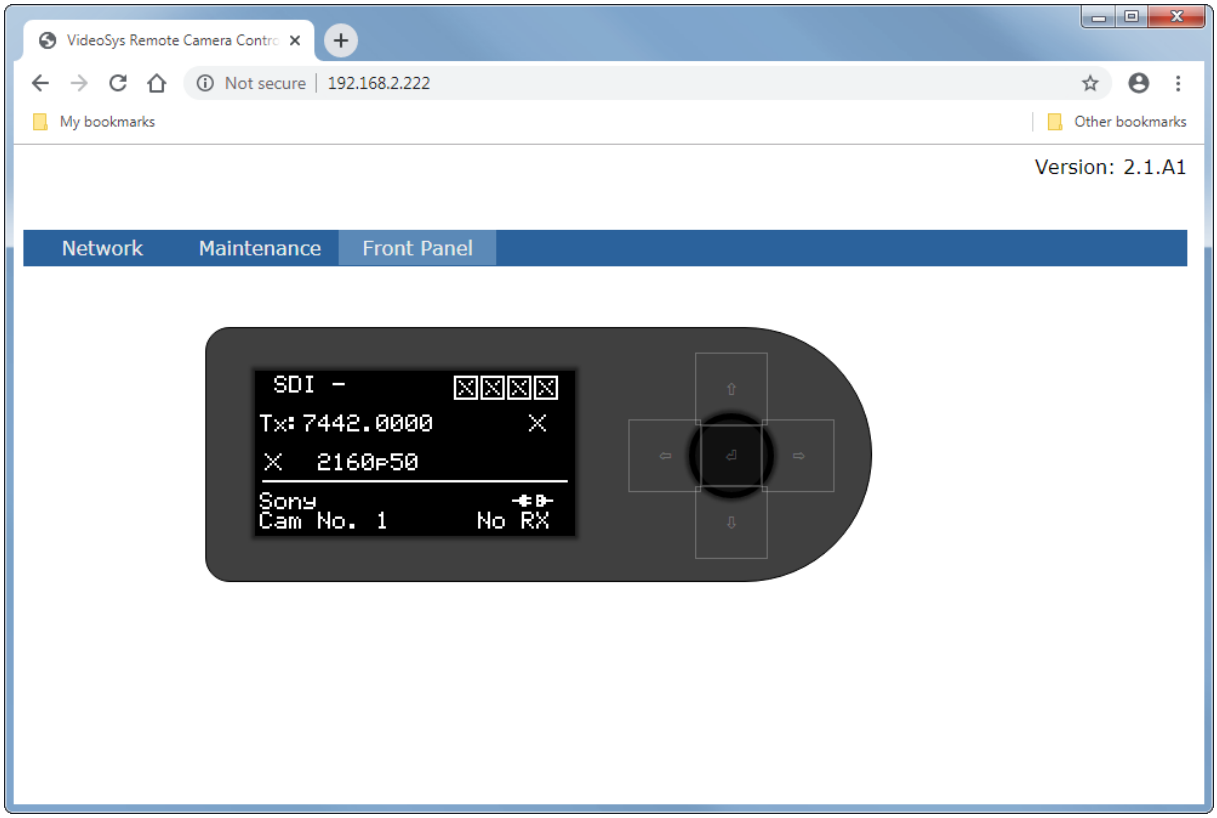
See *Chapter 5* for detailed explanation of OLED control.

4.4 Camera Control Web Browser Application

A web browser application provides a graphical user interface for control and monitoring of the AEON-CC. The device will need to be connected to a PC via the **ETH-0** port on the bottom panel.

The camera control IP address is shipped with a fixed IP address. The IP address can be found in the OLED display and changed, if required. The path to find the current IP address is **Camera Control>Network>IP Address**. The default address is **192.168.1.240**, enter this into the address bar of a web browser to open the AEON-CC web interface.

See *Chapter 6* for detailed explanation of the web GUI.



4.5 Encoder Web Browser Application

A web browser application provides a graphical user interface for control and monitoring of the internal HEVC encoder. The device will need to be connected to a PC or network via the **ETH-1** port on the bottom panel.

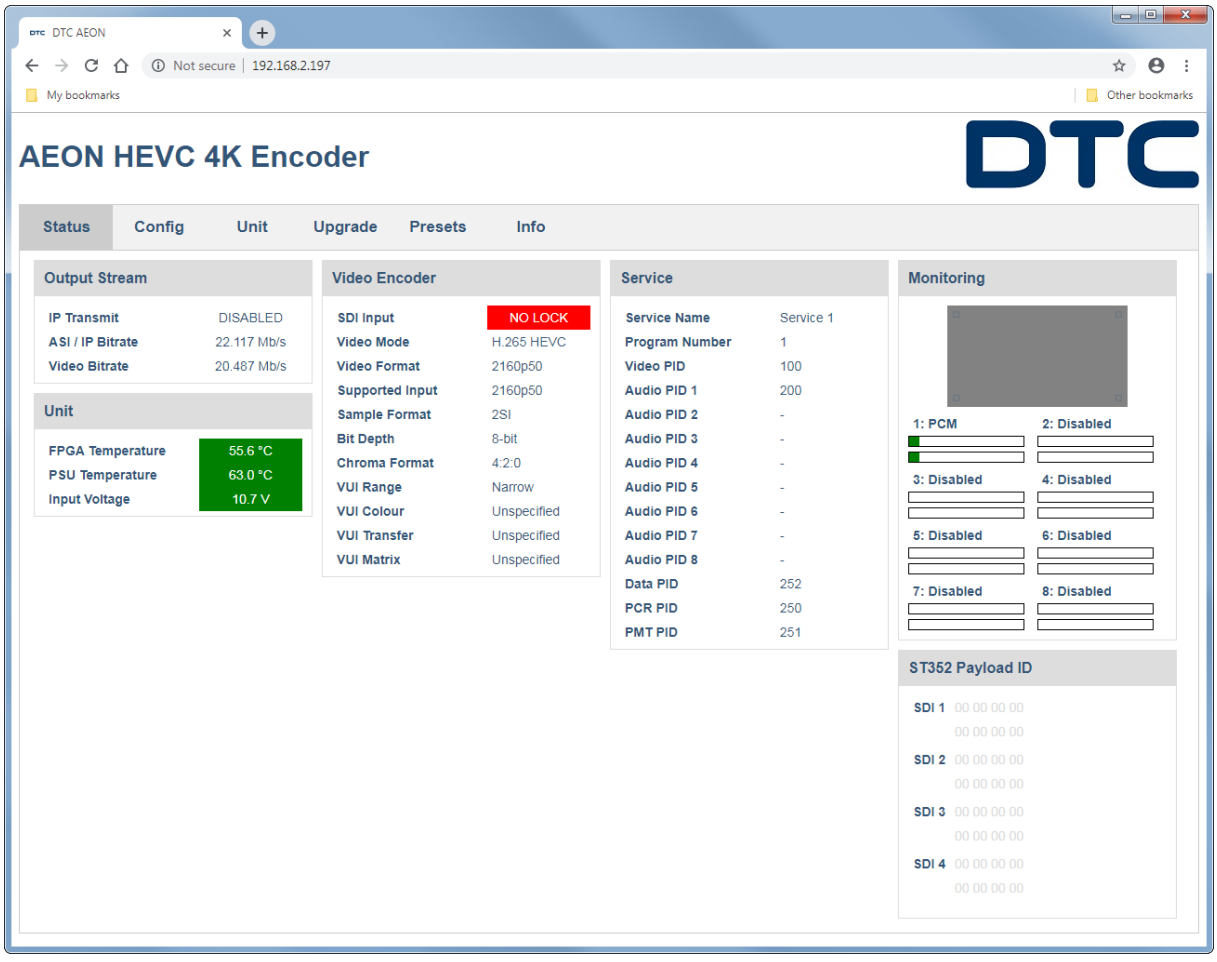
Although this is not the recommended method for control of the encoder, the web GUI does provide some useful monitoring information. Video and Audio helper buttons are also available to provide quick configuration of video and audio settings.

The encoder IP address is shipped with the DHCP setting enabled. This means that if the Ethernet port is connected to a network that is administered by a DHCP server, an IP address will be automatically allocated to it.

The IP address can be found in the OLED display and changed to a fixed IP address, if required. The path to find the current IP address is **Transmitter>Unit>Encoder>IP Address**.

When the IP address has been found, enter this into the address bar of a web browser to open the AEON-CC web interface.

See *Chapter 7* for an explanation of the web GUI useful features.



5. OLED Control

5.1 Introduction

The following sections will explain in detail the OLED control panel and indicators. It will detail how to navigate the OLED display and the menu structure to configure and monitor the AEON-CC when an Ethernet connection is not available.

The settings and status pages of the OLED will mirror those in the web browser applications.

5.2 OLED Indicators

LED indicators are provided to the left of the OLED display (shown above) to give basic confidence of the following:

- **STS** – the status LED will light green when the video input to the encoder is good and red when it is not
- **TX** –the transmit LED will light green when the COFDM RF power is on
- **RX** – the receive LED will light (flash) when data packets are being received. This does not necessarily indicate the validity of the received data and should be observed in conjunction with the data status on the OLED which will display 'Data Good' if packets are decoded successfully.

5.3 Navigation Buttons

Scroll through, select and save settings on the OLED display using the navigation buttons which are located to the right of the OLED display (shown above). The button functions are:

- **Up/down arrow** – these buttons will scroll through the menu list. When a value is to be edited, use the up/down arrows to select a new character or number.
- **Left/right arrow** – the right arrow will select a sub-menu and the left arrow will return to the previous. When a value is to be edited, use the left/right arrows to select a character or number to be changed. Use the left arrow to discard edits and return to the saved setting.
- **Centre button** – selects a value to be edited. When a new value has been set using the direction arrows, press the enter button again to save the setting.

5.4 OLED Display Menu Structure

From the status screen, use the right arrow to enter the **Camera Control** or **Transmitter** menu.

5.4.1 Camera Control Menu

Camera Manufacturer –>
None
Panasonic
Gv LDK
Ikegami
Hitachi
Pan Studio
Pan Ec4
Arri
DreamChip
Sony VISCA
Gv LDX
Gv Bi-Dir

Radio –> **Primary Frequency** –> Camera receive frequency

Multi Zone Menu –> **Multi Zone Mode** –> Primary Freq Only / Use Freq List

Multi Zone AF List –>

PER Threshold –>

RX Timeout Threshold –>

RX Search Delay –>

Reset –>

System –> **System Info** –> SN
FW
Satel SN

License Info –> Licensed cameras

License Key 1 –>

License Key 2 –>

Camera Options –> **Arri IP Port** –>
(for example)

System Reset –> Exit
Clear Settings

Screen Flip –> Normal
Reversed

Camera Number –> 0-99 selectable

Network –> **IP Address** –>

Netmask –> IP settings for the camera control module

Net Gateway –>

5.4.2 Transmitter Menu

RF –> **Mod Frequency** –> A frequency within the bandwidth of the product

Output Atten. –> Attenuation applied to the output

Linearity Mode –> Lower Power
Better Lin.

RF output –> Off
On

Output Power –> 10mW
50mW
100mW
(200mW-5W options for Amps)

Additional PA –> PA options

Modulation Scheme –> NB/UMVL
DVB-T

NB/UMVL	–>	**Bandwidth**	–>	2.5MHz (NB) 1.25MHz (NB) 625kHz (NB) 6MHz (UMVL) 7MHz (UMVL) 8MHz (UMVL)
		Constellation	–>	QPSK 16QAM 64QAM
		FEC	–>	1/2 2/3 3/4 5/6 7/8
		Guard Interval	–>	1/32 1/16 1/8 1/4
		Polarity	–>	Normal Inverted

DTC equipment operate in Normal

DVB-T	–>	**Bandwidth**	–>	2.5MHz (N/A) 1.25MHz (N/A) 625kHz (N/A) 6MHz 7MHz 8MHz
		Constellation	–>	QPSK 16QAM 64QAM
		FEC	–>	1/2 2/3 3/4 5/6 7/8
		Guard Interval	–>	1/32 1/16 1/8 1/4
		Polarity	–>	Normal Inverted

DTC equipment operate in Normal

4K Offset	–>	None +4kHz -4kHz	Shifts the spectrum by one carrier (approx. 4kHz) to overcome interference.
Dual Ped	–>	Off On	Doubles the bitrate using two adjacent COFDM channels, also doubles the bandwidth.

Video	–>	**Video Format**	–>	480i59, 576i50 480p59, 576p50 720p50/59/60 1080i50/59/60 1080p23/24/25/29/30/50/59/60 1080psf23/24/25/29/30 2160p23/24/25/29/30/50/59/60
		Encoder Mode	–>	HEVC AVC MPEG-2
		Chroma Format	–>	4:2:0 4:2:2
		Bit Depth	–>	8-bit 10-bit
		Delay Mode	–>	Normal Low Delay Ultra Low
		Current Mux Mbps	–>	Status only
		HDR/WCG Mode	–>	Auto SDR 709/601 SDR 2020 CL SDR 2020 NCL HLG 2100 YCbCr HLG 2100 ICtCp PQ 2100 YCbCr PQ 2100 ICtCp
				High Dynamic Range (**HDR**) and Wide Colour Gamut (**WCG**) setting.
		QL3G Format	–>	2SI SQD
				2 Sample Interleave (2SI) – each 3G-SDI link contains a full image at 1/4 resolution. Square Division (SQD) – each 3G-SDI link contains one quarter of the original image.
		Quad-Sync	–>	Off On
				Set this On to synchronise four non time-aligned HD sources.

Audio	–>	**Encoder Setup**	–>	**Encoder 1**	–>	**Mode**	–>	Off LPCM (16b) AAC MP1-Layer1 MP1-Layer2 LPCM (20b) LPCM (24b)
						Source	–>	Analogue Embed 1 (1/2) Tone
				Encoder 2	–>	**Mode**	–>	Off LPCM (16b) AAC MP1-Layer1 MP1-Layer2 LPCM (20b) LPCM (24b)
						Source	–>	Analogue Embed 1 (3/4) Embed 2 (1/2) Tone
				Encoder 3	–>	**Mode**	–>	Off LPCM (16b) AAC MP1-Layer1 MP1-Layer2 LPCM (20b) LPCM (24b)
						Source	–>	Analogue Embed 1 (5/6) Embed 3 (1/2) Tone
				Encoder 4	–>	**Mode**	–>	Off LPCM (16b) AAC MP1-Layer1 MP1-Layer2 LPCM (20b) LPCM (24b)
						Source	–>	Analogue Embed 1 (7/8) Embed 4 (1/2) Tone
		Analogue Input	–>	**Gain Left**	–>	(dB)		
				Gain Right	–>	(dB)		
				Phantom Left	–>	Disabled Enabled		48V
				Phantom Right	–>	Disabled Enabled		48V

Unit	–>	**Modulator**	–>	**Serial No.**	–>	The transmitter ESN
				Software V.	–>	Current software
				Mod FPGA Temp	–>	(°C)
				Reset to Default	–>	Reset Cancel
		Encoder	–>	**IP Address**	–>	
				Static IP	–>	Set if DHCP is disabled
				Gateway	–>	Set if DHCP is disabled
				Netmask	–>	Set if DHCP is disabled
				DHCP	–>	Disabled Enabled
				Enc. FPGA Temp	–>	(°C)
				Enc. PSU Temp	–>	(°C)
				Serial No.	–>	The encoder ESN
				Software V.	–>	Current software
				Reset to Default	–>	Reset Cancel

Engineering	–>	**Modulator**	–>	**ASI Status**	–>	
				Modulator State	–>	
		Encoder	–>	**Video PID**	–>	Default 100
				Audio PID 0	–>	Default 200
				Audio PID 1	–>	Default 201
				Audio PID 2	–>	Default 202
				Audio PID 3	–>	Default 203
				PCR PID	–>	Default 250
				PMT PID	–>	Default 251
				SIT PID	–>	Default 017
				Data PID	–>	Default 252
				Video Lock	–>	
		SDI Config	–>	SMPTE Std 800mV Non SMPTE 900mV Auto PPV Comp.		

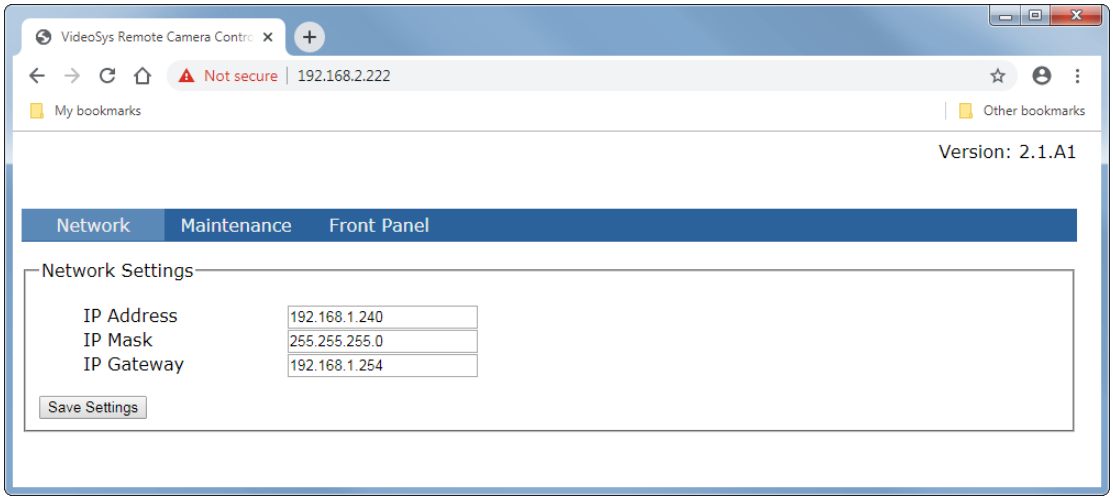
6. Camera Control Web Browser Operation

6.1 Introduction

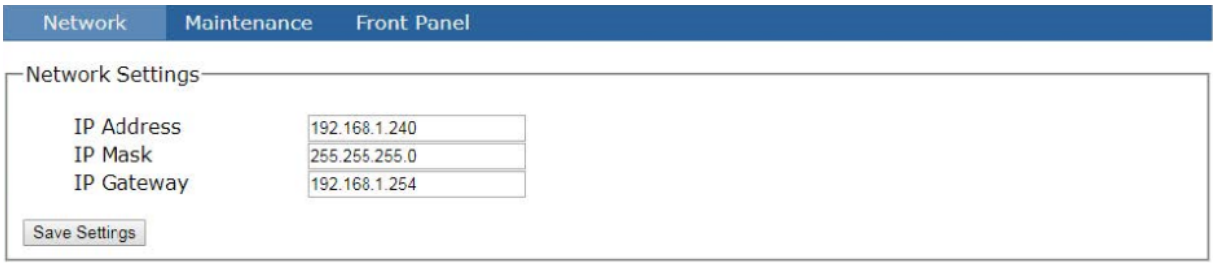
A web browser application can be used to change the IP settings, perform upgrades or configure the AEON-CC using front panel emulation.

This chapter explains web browser operation of the AEON-CC device.

Note: For detailed information regarding the camera control system, please refer to the VideoSys Broadcast website, https://videosys.tv/files/Videosys%20Products/Camera%20Control/Guides/.



6.2 Network Page

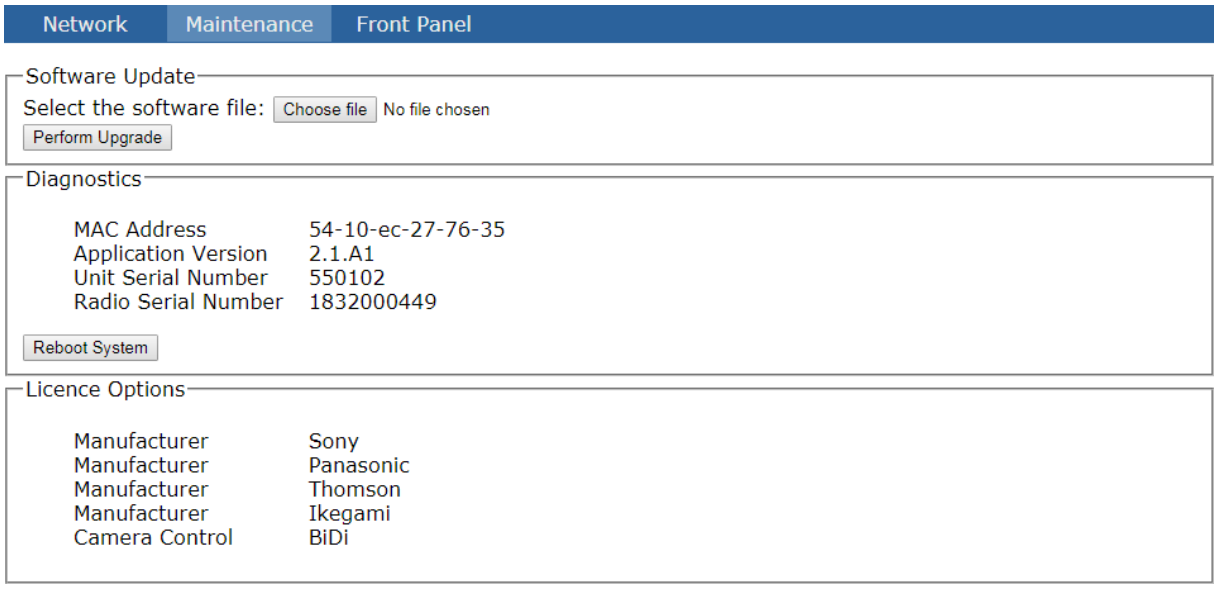


The camera control module IP parameters can be configured from the Network page. The IP address is fixed, so this may need to be changed to match the network subnet that it will be connected to.

The default IP address is 192.168.1.240.

Click **Save Settings** to save the settings and make them active.

6.3 Maintenance Page



Camera control module software upgrades can be performed from the Maintenance page. System information and licensing details are also displayed which may be useful in a service call.

When a software upgrade is available, DTC will provide the upgrade file, save this file to a convenient location on the PC.

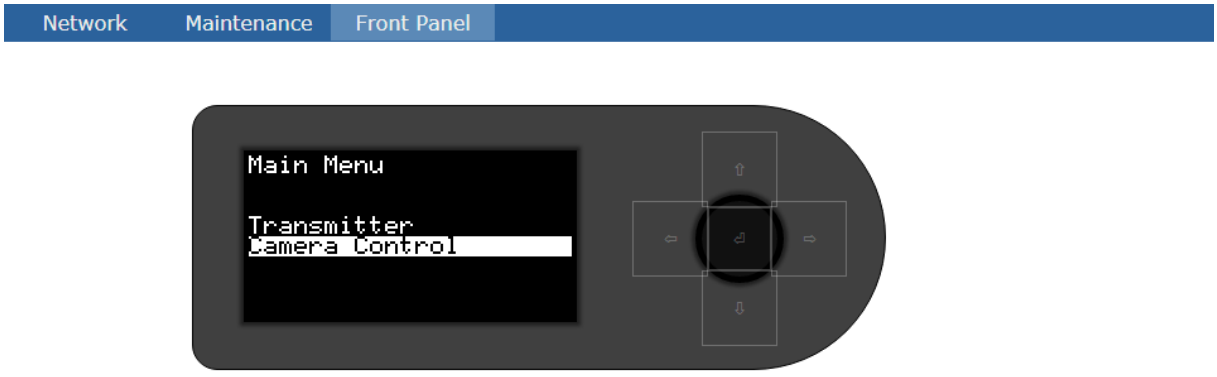
Select **Choose File** and browse to the location of the upgrade file, the file name will appear adjacent to the Choose File button when selected.

Click **Perform Upgrade** and allow the upgrade to perform, do not switch off the unit until the new software version is displayed in the OLED status page.

6.4 The Front Panel Page

The Front Panel page emulates the OLED display for system monitoring or when settings need to be changed from a remote location. Refer to *Section 5.4* for menu structure.

Use the arrows and enter button to access and edit settings as for the OLED display.

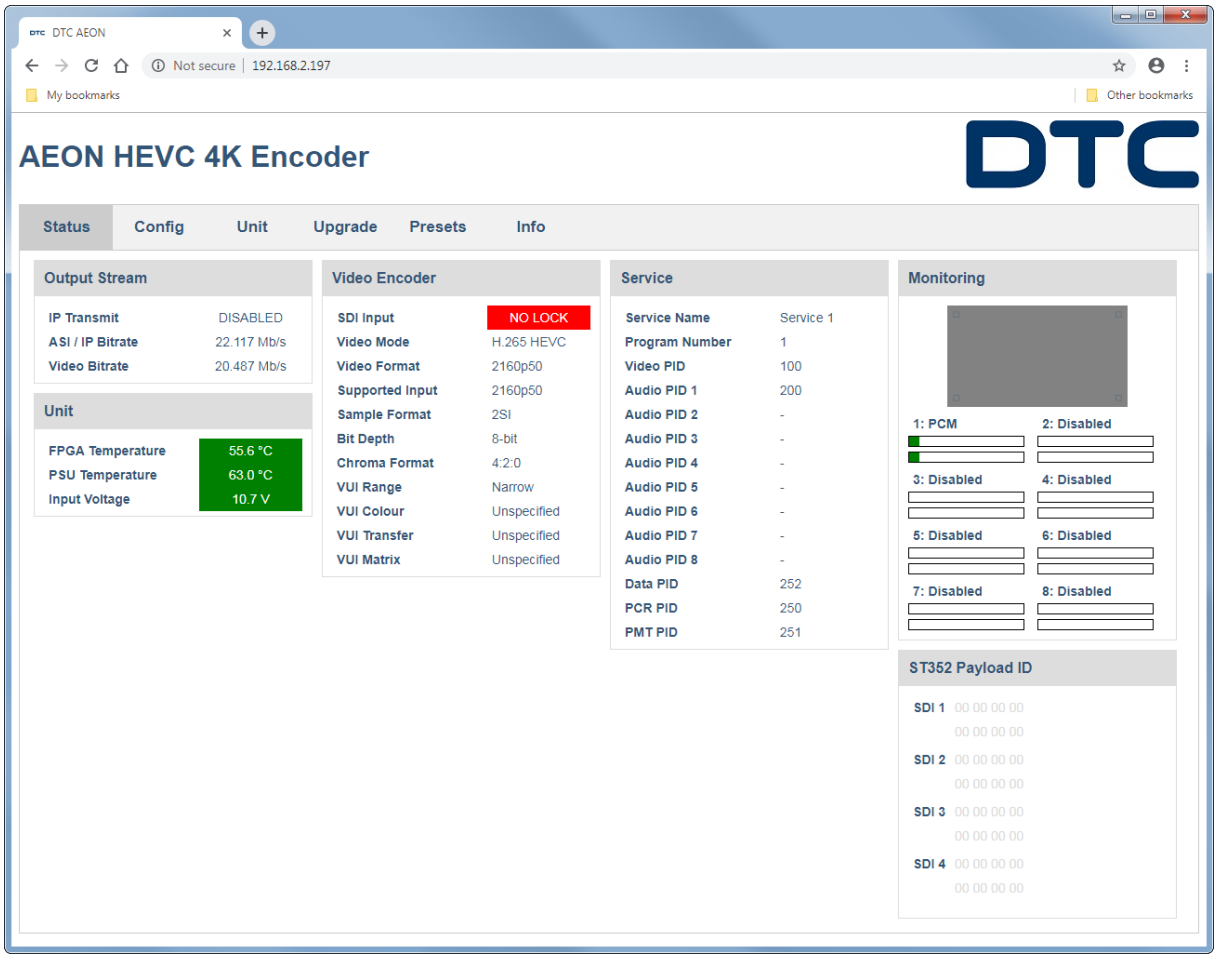


7. Encoder Web Browser Operation

7.1 Introduction

A web browser application can be used to monitor status, perform upgrades, and provide information on software and licensing of the AEON-CC encoder module.

It is not recommended to use the encoder web browser for configuration of the AEON-CC encoder, however, this chapter explains some useful features which may be of benefit to the user.

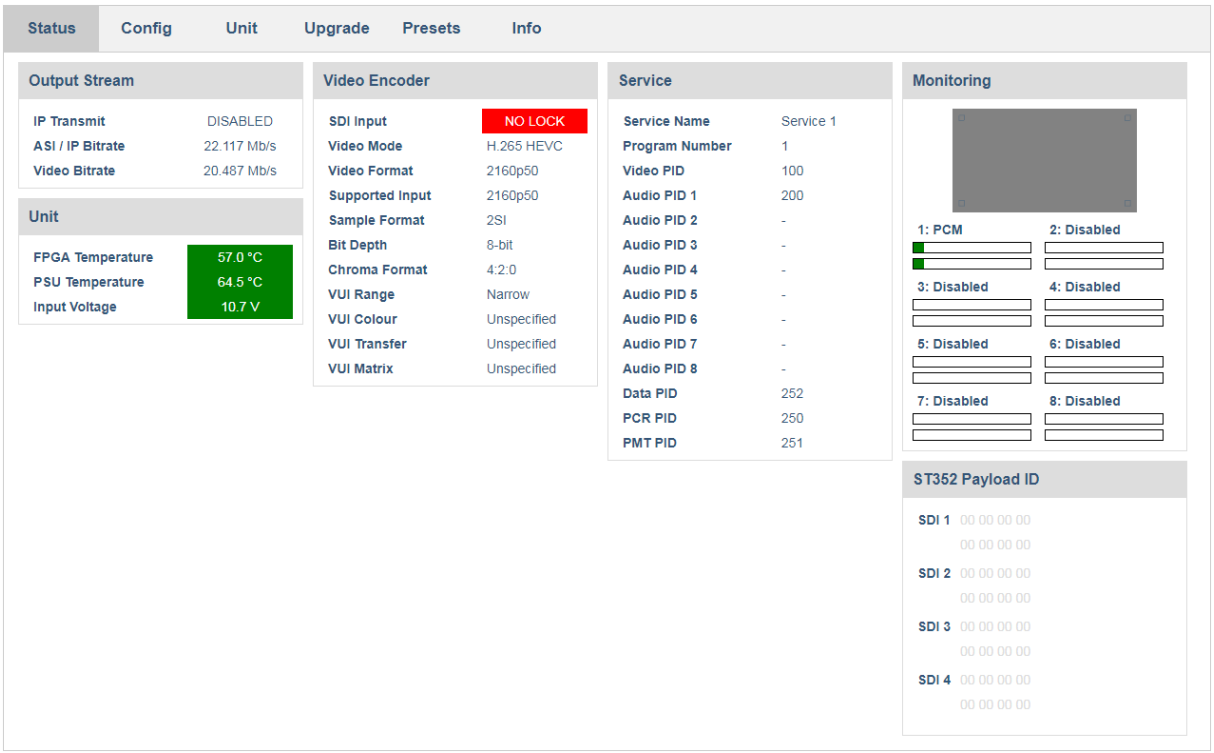


7.2 Status Page

When the web browser application is opened, the Status page is the opening screen.

The Status page displays current RF COFDM, encoder and unit information. The Monitoring panel displays a slow refreshing video preview and audio level indicators.

CAUTION: If the temperature status turns red, switch off the AEON-CC immediately and allow to cool. Failure to do so may result in damage to internal components.

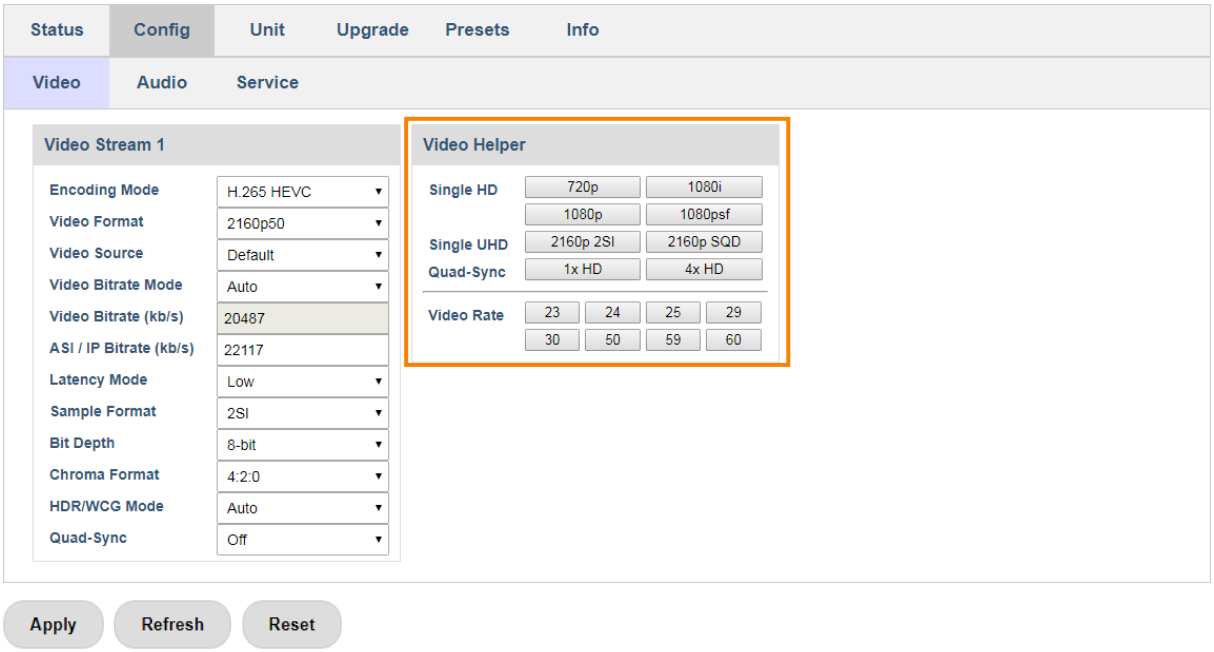


7.3 Config>Video Page

The **Video Helper** tool provides quick setup of video format and quad-sync options using the auto configure buttons.

When a button is clicked, the video stream settings will auto configure according to the selection.

Click **Apply** to save the settings and make them active. Click **Refresh** to return to the saved settings.

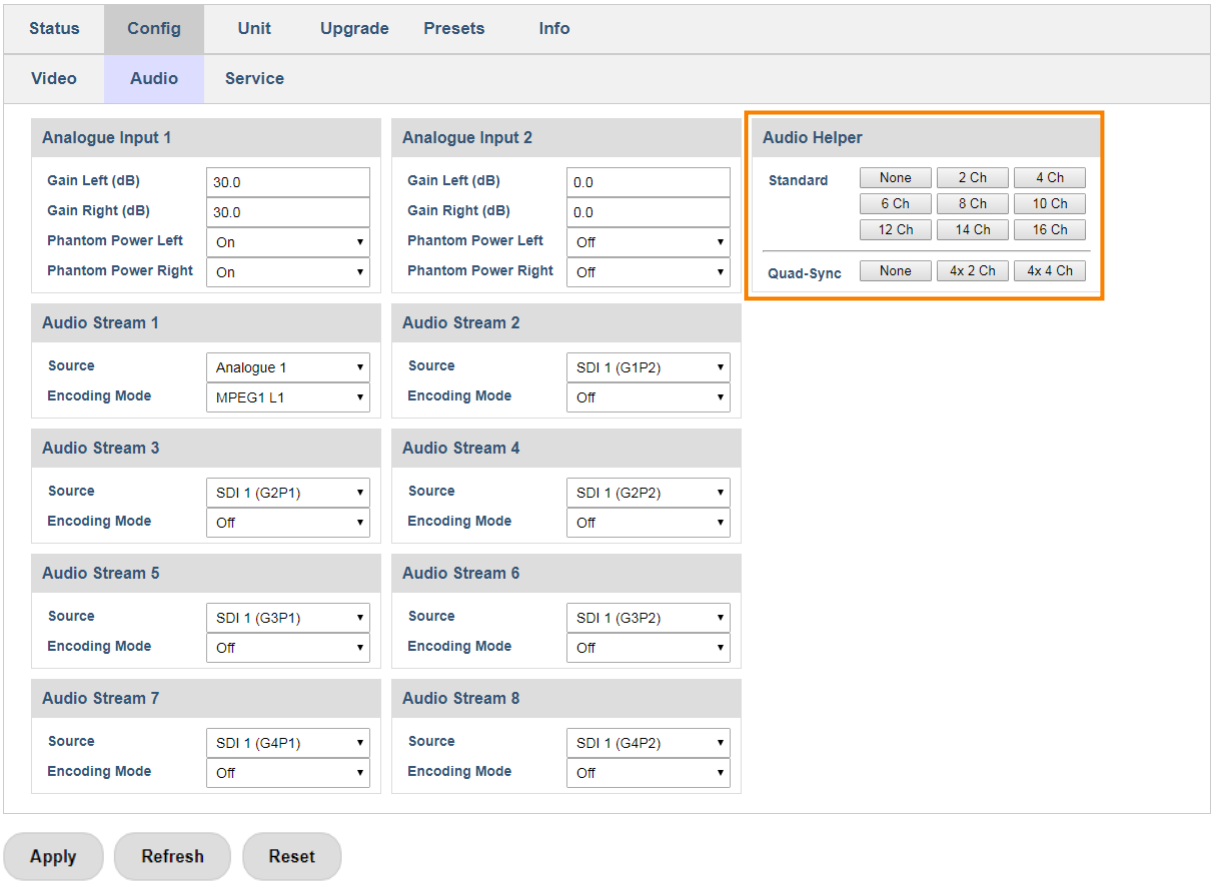


7.4 Config>Audio Page

The **Audio Helper** tool will configure embedded audio for standard or quad-sync operation and enable the required number of channels using the auto configure buttons.

When a button is clicked, the audio stream settings will auto configure according to the selection.

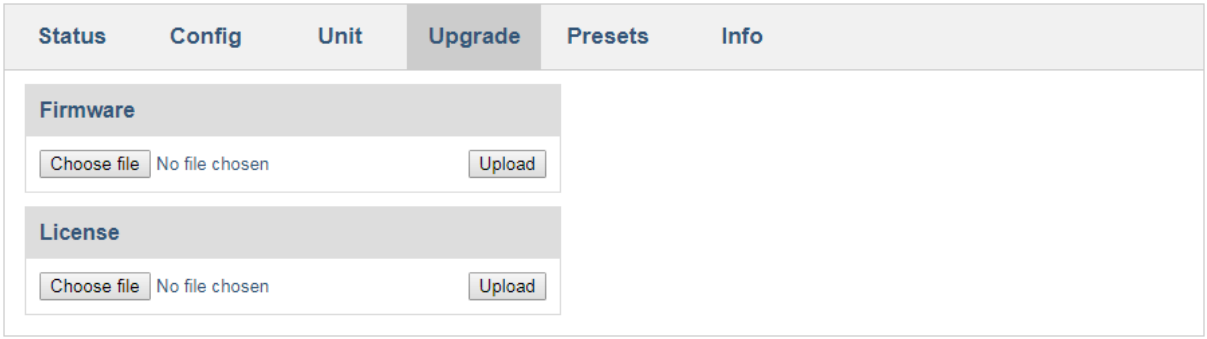
Click **Apply** to save the settings and make them active. Click **Refresh** to return to the saved settings.



7.5 Upgrade Page

Firmware upgrades for the AEON-CC encoder are loaded via the Ethernet connection on the bottom panel. If there is a firmware upgrade available, DTC will provide an upgrade file or it can be downloaded from DTC's WatchDox facility, see *section 9.1*.

In the unlikely event that a new license will need to be uploaded, the license file will be provided by DTC and follow the same process as the firmware upgrade.



When **Choose File** is selected, a standard windows browsing window will open. Browse to the saved upgrade file, select **Open** and click **Upload** on the web browser.

The web browser page will change from downloading code to an updating page. The power to the AEON-CC **must not** be removed at any stage during the update.

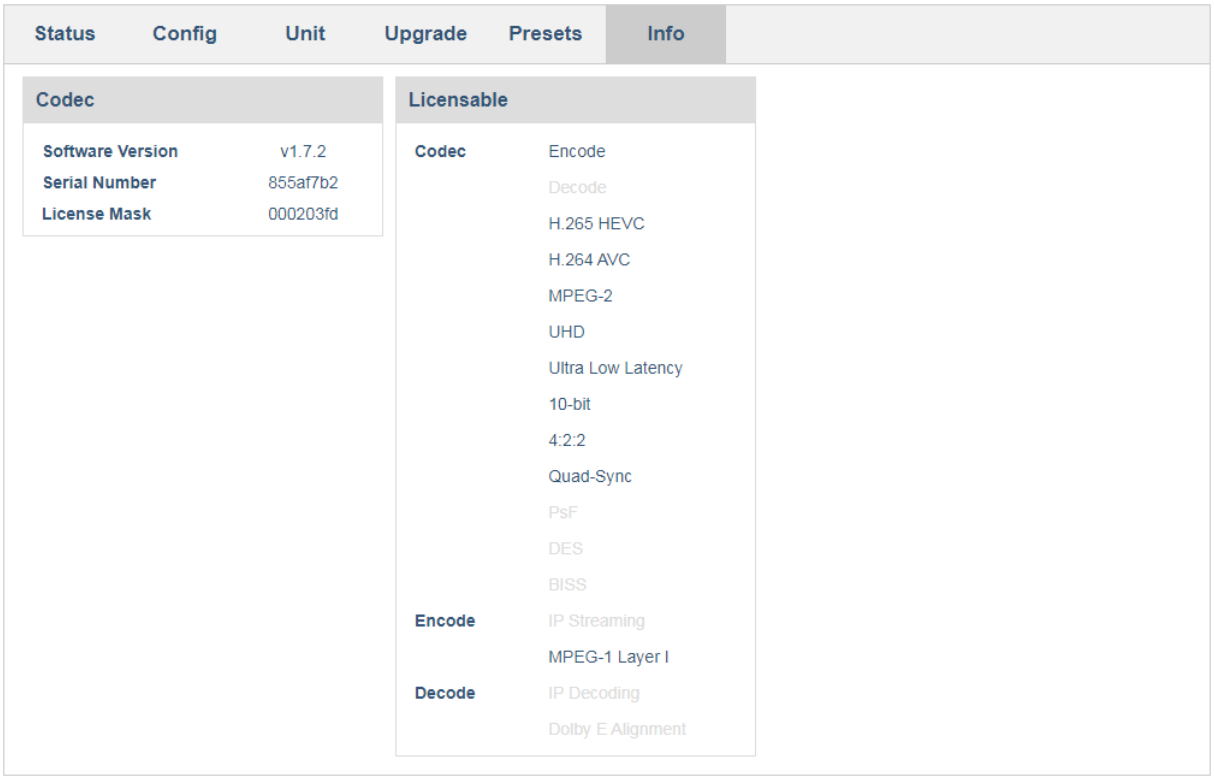
Please wait approximately 10 minutes for the upgrade to complete and reboot the unit.

If the upgrade has been successful, the **Codec Software Version** on the Info page will be upissued.

7.6 Info Page

The **Info** page provides information which may be useful in service calls to DTC.

The **Codec** information relates to the internal HEVC encoder module. The **Licensable** information shows the currently enabled licenses in bold.



8. Appendix A – Reference Material

8.1 How to Configure a PC IP Address

The following guide details how to configure a PC or laptop IP address so that it matches the IP address range of the unit you are connected to. This is important because if they don't match, you will not be able to communicate with your device.

The IP address range given in this example is a good one to use if you are unsure.

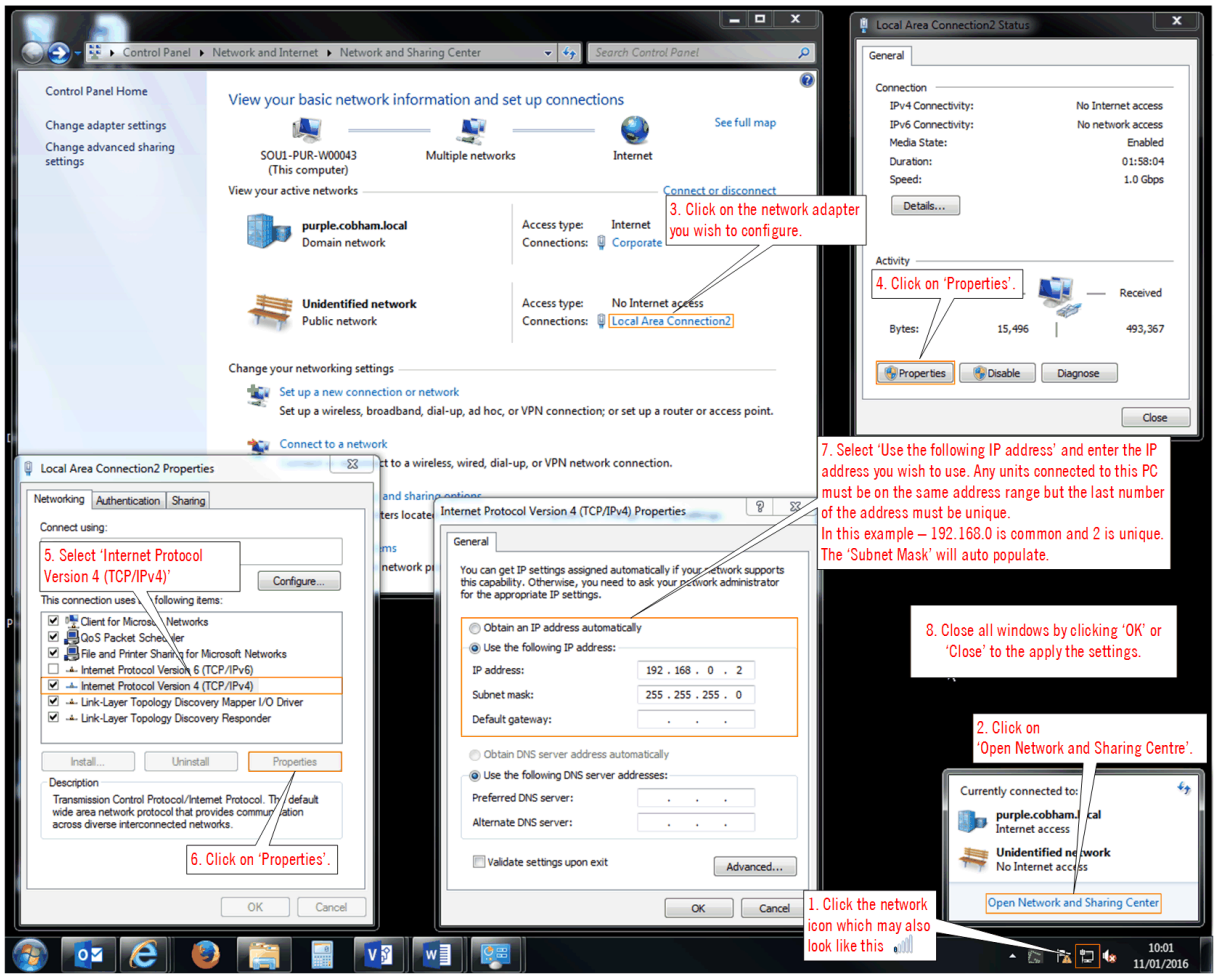


Figure 8-1 How to configure a PC IP address

9. Appendix B – After-Sales Support

9.1 Documentation and Software

It is DTC's practise to make the majority of our latest user guides and software available to customers online, by using our WatchDox facility. To access this site, please contact your Account Manager or send a request to solent.support@domotactical.com.

You will be sent a link where you can log in and create your own password followed by a confirmation email. Once you have done this, you can then log in to your account.

9.2 Contact Technical Support

The Technical Support team can be accessed by one of the following:

- **Post**: DTC – Solent, Fusion 2, 110 Parkway, Solent Business Park, Whiteley, Hampshire, PO15 7AB, England
- **Phone**: +44 1489 884 550. Office hours: 0900-1700 UK time excluding holidays
- **Email**: solent.support@domotactical.com (no restricted content)

9.3 Using the DTC RMA Service

If there is a problem, the Return Material Authorisation (RMA) service may be requested.

9.3.1 Contact DTC

In the first instance, please call Technical Support. If this has been done and the issue cannot be resolved, email solent.customerhub@domotactical.com to request an RMA form.

9.3.2 Complete and Return the RMA Form

Complete the RMA form with the following information and return to the customer hub:

- Name
- Address
- Unit serial number
- Date of purchase or the original invoice number
- Date of failure
- A detailed description of the problems that have been encountered
- A list of the hardware/software configuration if applicable

Once the hub receive the complete form, we will then send an RMA number and shipping instructions.

9.3.3 Pack the Device

Note: Before packing, remove all personal non-DTC kit or media from the device.

Use the original shipping container and packing materials, if possible.

If the original packing materials are not available, wrap the equipment with soft material (e.g. PU/PE form) then put the wrapped equipment into a hard cardboard shipping box.

9.3.4 Put the RMA Number on the Box

Clearly mark the outside of the shipping box with the RMA number. If an RMA number is not present on the shipping box, receiving will be unable to identify it and it might be returned.

9.3.5 Send the Box to DTC

Send the box to DTC using normal shipping process.

10. Appendix C – Safety and Maintenance

Note: The following guidelines may or may not be applicable to your product. However, we would ask that you read them to assess their relevance.

10.1 Cautions and Warnings

Area	Note
Aircraft safety	Use of this equipment on board aircraft is strictly forbidden without the required testing and qualification for aircraft type. Use of radio transmitter equipment in an aircraft can endanger navigation and other systems without appropriate testing, or carry-on certification by a competent certified body.
Cables	Connecting cables should not be positioned where they are likely to become damaged or where they may present a trip hazard.
Electro static discharge	ESD guidelines must be followed for this electrostatic sensitive device.
Enclosures	Do not remove any factory installed screws or fastenings. Damage to the units may result and void any warranties. Only authorised, trained personnel should open the product. There are no functions that require the user to gain access to the interior of the product. There are no user serviceable parts inside.
Environment	The equipment should not be used in hazardous or corrosive atmospheres. Users are reminded of the necessity of complying with restrictions regarding the use of radio devices in fuel depots, chemical plants and locations where explosives are stored and/or used.
Lightning strike	There is a risk of lightning strike to antennas. The equipment should not be assembled in an area at the time of lightning activity. Antennas should be adequately protected from lightning strikes.
Power supply	Ensure that the power supply arrangements are adequate to meet the stated requirements of each product. Observe all electrical safety precautions.
Risk of eye injury	Care should be taken to avoid eye contact with the antennas.
RF emissions	When using this device please ensure a distance of 20cm is maintained between your device and your body while the device is transmitting.
Thermal control system	Any powered device will always produce heat as a by-product of its operation. If you operate this device in an enclosed space you must ensure it has adequate airflow to keep it cool. If worn close to the body, care must be taken to protect the operator from excessive temperatures.
Working at height	Observe caution when locating the device at height, for example on a mast. Ensure the unit is well secured to prevent it falling and injuring personnel.

10.2 Repairs and Alterations

Attempted repairs, alterations, improper installations or connections may invalidate the warranty.

Please contact Technical Support if you suspect a faulty or defective component. See *section 9.2*.

10.3 Caring for the Equipment

- Do not subject the unit to physical abuse, excessive shock or vibration
- Do not drop, jar or throw the unit
- Do not carry the unit by the antenna
- Avoid exposure to excessive moisture or liquids
- Do not submerse the unit unless it is designed to be submersible
- Do not expose the unit to corrosives, solvents, cleaners or mineral spirits
- Avoid exposure to excessive cold and heat
- Avoid prolonged exposure to direct sunlight
- Do not place or leave units on surfaces that are unstable
- Only use accessories intended for the specific make and model of your unit, especially batteries, chargers and power adapters.

10.4 Charging

- Use approved batteries, chargers and adapters designed specifically for your make and model unit
- Do not attempt to charge a wet unit or battery pack
- Do not charge the unit or battery pack near anything flammable
- Stabilize the battery pack to room temperature (22°C) before charging
- Do not charge units and/or battery packs on wet or unstable surfaces
- Do not leave units and/or batteries in chargers for excessive periods

10.5 Working with Lithium Batteries

- Charge only with the approved charging cable
- Batteries are to be used only for the specified purpose. Incorrect use will invalidate the warranty and may make the battery become dangerous.
- Charge in a clean, dry environment ideally at 10°C (0 to 45°C is permissible).
- Do not store or operate in direct sunlight for extended periods. Battery can be damaged by over-heating, for example if placed on the rear parcel shelf of a motor vehicle.
- Store in a cool dry environment. Storage at elevated temperatures can cause permanent loss of capacity.
- For short term storage (less than six months), store in a fully charged state.
- For extended periods of storage (more than one year), charge before storage and recharge every six to nine months.
- Always fully recharge the battery after any storage period greater than one month before use.

- Do not store the battery with the charge depleted as this can cause failure of the battery and invalidate warranty.
- Do not short circuit
- Do not immerse in water
- Do not incinerate. Cells are likely to explode if placed in a fire.
- Dispose of batteries in accordance with the regulations in place for the country of use. Batteries are normally considered separate waste and should not be allowed to enter the normal waste stream. Either return to the seller, or deliver to an approved re-cycling facility.

10.6 Cleaning

- Turn off the unit and remove batteries (if applicable) before maintenance
- Use a clean, soft, damp cloth to clean the unit. A microfiber cloth is recommended.
- Do not use alcohol or cleaning solutions to clean the unit
- Do not immerse the unit in water to clean it
- If the unit becomes wet, immediately dry it with a microfiber or other lint-free cloth

10.7 Storage

- Turn off the unit and remove batteries before storage
- Store units and battery packs in a cool, dry area at room temperature (22°C)
- Do not store units and/or batteries in active chargers

11. Appendix D – Glossary

A	Definition
AES	Advanced Encryption Standard. Originally published as Rijndael, this specification has been adopted by the U.S. government. Each AES cipher has a 128-bit block size, with key sizes of 128 and 256 bits, respectively.
ASI	Asynchronous Serial Interface is a streaming data interface that often carries an MPEG Transport Stream. An ASI signal can carry one or multiple SD, HD or audio programs that are already compressed, not like an uncompressed SD-SDI (270Mbs) or HD-SDI (1.45Gbs). An ASI signal can carry varying amounts of data but is always padded to run at a fixed line rate of 270 Mb/s.
Antenna Gain	Antenna gain is a measure of how well an antenna converts power into radio waves or radio waves into power, depending on whether it is fitted to a transmitter or receiver device. Antenna gain is expressed in dB (decibels).

B	Definition
Bandwidth	RF – the width of a band of frequencies used for a particular purpose. Computing – the rate of data transfer measured in bit/s.

C	Definition
COFDM	Coded Orthogonal Frequency Division Multiplexing is a frequency-division multiplexing (FDM) scheme utilized as a digital multi-carrier modulation method. A large number of closely spaced orthogonal sub-carriers are used to carry data.

D	Definition
Decibel (dB)	The standard unit used to express transmission gain or loss and relative power levels.
Decoder	A processor in a receiver that converts compressed digital video or audio data to a format suitable for monitoring.
Demodulate	To recover the information originally impressed on the radio wave.
Downconverter	A device that converts microwave frequencies to UHF frequencies for use in DTC receivers.

E	Definition
Elementary Stream	These streams contain only one MPEG video or audio channel. Elementary streams are required if you intend to use Milestone VMS or any player that cannot operate with transport streams.
Encoder	A processor in a transmitter that converts video or audio to compressed digital signals.

F	Definition
FEC	Forward Error Correction is a system of error control for data transmission, whereby the sender adds redundant data to its messages. This allows the receiver to detect and correct errors without the need to ask the sender for additional data.
FPGA	A Field-Programmable Gate Array is an integrated circuit that can be programmed to perform complex logic functions.

G	Definition
Gain	An increase in signal strength, typically by an amplifier.
GUI	A Graphical User Interface allows users to interact with an electronic device.

I	Definition
IP address	An Internet Protocol address is a unique numeric ID for a device within a network.

L	Definition
LOS	Line-of-sight propagation refers to RF transmissions that travel in a direct path from transmitter to receiver.

M	Definition
MPEG	Moving Pictures Experts Group is an organisation that sets the standards for audio and video compression and transmission.
Modulation	To change the output of a transmitter in amplitude, phase or frequency in accordance with the information to be transmitted. Data is superimposed on a carrier current or wave by means of a process called modulation.
Multicast	Multicasting is sending data from a sender to multiple receivers where each receiver signals that they want to receive the data.

N	Definition
NLOS	Non-line-of-sight propagation refers to RF transmissions that travel in a path obstructed by physical objects.
NTSC	National Television Systems Committee is the analogue television system used mainly, but not exclusively, in the Americas.
Noise	Unwanted disturbance in an electrical signal.

O	Definition
Omnidirectional antenna	An antenna whose radiation pattern shows equal radiation in all horizontal directions.

P	Definition
PAL	Phase Alternate Line is the analogue television system used mainly, but not exclusively, throughout the world (see NTSC).
PTZ	Pan-tilt-zoom is a common way of referring to controllable cameras.

Q	Definition
QAM	Quadrature Amplitude Modulation. DTC products commonly use either the 16 state (16-QAM) or 64 state (64-QAM) modulation schemes
QPSK	Quadrature Phase Shift Keying digital modulation scheme.

R	Definition
RTSP	Real Time Streaming Protocol is a network control protocol designed for the transfer of real-time media data The protocol is used for establishing and controlling media sessions between end points.

S	Definition
SDI	Serial Digital Interface is a standard used for the transmission of uncompressed digital video signals, often including embedded audio.
SNR	Signal to Noise Ratio is an electrical engineering measurement defined as the ratio of wanted signal power to the corrupting noise power. The higher the ratio, the less obtrusive the background noise is.
Streaming	Streaming is the transmission of digital media over an IP network.

T	Definition
Transport Stream	A standard digital container format for transmission and storage of audio, video, and Program and System Information Protocol (PSIP) data. Channels are multiplexed together, allowing the receiver to choose which to play back.

U	Definition
UDP	User Datagram Protocol is a core of the Internet Protocol suite. UDP does not employ reliability mechanisms, therefore, if the receiver does not get a packet, the sender will never know. However, UDP is very efficient when there is little chance of errors.
USB	Universal Serial Bus defines the cables, connectors and protocols used in electronic bus connections.
Unicast	Unicast is simply sending packets from one source to one destination.

V	Definition
Viterbi Decoder	A Viterbi decoder uses the Viterbi algorithm for decoding a bit stream that has been encoded using forward error correction based on a convolutional code.

W	Definition
Waveguide	A specially formed hollow metal tube, usually rectangular in cross section, used to connect a high power amplifier to the antenna.