

Resource Identifier 100249

Revision: 1.0



AEON Family User Guide



Commercial in Confidence

DTC – Solent
Fusion 2
1100 Parkway
Solent Business Park
Whiteley
Hampshire
PO15 7AB
United Kingdom

+44 (0)1489 566 750

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 you will be working with.

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

0.2 Who Should Read this Publication

This document is meant for anyone interested in how the system can best 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 Assumed Knowledge

Throughout this book it is assumed that the reader has a thorough knowledge of:

- Basic personal computer operations
- Basic radio frequency (RF) principles

0.4 Notice about Specifications

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 design-centre specifications and are included for customer guidance and to facilitate system installation. Actual operating performance may vary.

0.5 Notice about this Guide

The product described in this manual is subject to continuous development and improvement. All particulars of the product and its use (including the information and particulars in this guide) are given by DTC in good faith. However, it is acknowledged there may be errors or omissions in this guide.

0.6 Typographic Conventions

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

Typographic Convention	Example
TEXT in non-bold capitals represents a specific key press on the console keyboard or hardware panel.	ESC, F1, SHIFT
The + sign means “hold down the first key while pressing the second key”.	Press CTRL+C to abort
<Text> Serves as a placeholder for variable text that you will replace as appropriate to its context.	Use the filename <system_name>.sys for...
Text in bold emphasises a new word or term of significance.	We call this a protocol and its function is...
Text in italics can represent a link to place in the existing document (often these are hyperlinks) or a reference to another document.	Refer to <i>Section 0.6, Typographic Conventions</i> .
Successive menu selections are shown using arrows to indicate a sub-menu. In this example this would mean: Select the Insert menu, then select picture , then select from file .	Insert>picture>from file

0.7 Symbols

This document uses these symbols to highlight important information:

WARNING: A written notice given to a reader when a situation might result in personal injury or loss of life.

CAUTION: A written notice given when a situation might result in loss of data, damage to or destruction of equipment or systems.

Note: A written notice given to draw the reader’s attention to something or to supply additional information.

0.8 Trademarks

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

© 2018 Domo Tactical Communications (DTC) Limited

Domo Tactical Communications (DTC) Limited owns the copyright of this document which is supplied in confidence and must not be used for any purpose other than for which it is supplied and must not be reproduced without permission in writing from the owners.

0.9 Related Documents

You may also need to refer to:

Document	Source
Solo Concept Guide	DTC
IP Concept Guide	DTC
NETNode Phase 5 Software User Guide	DTC

0.10 Document History

This document was written and produced by the DTC Technical Publications Team.

This is a change controlled document. Each main page of this document displays a revision number at the bottom left corner of the page. The revision and date of issue are also indicated in the table below.

Changes to any page will raise the revision status of the whole document.

Revision	Date	Authors	Summary of Changes
1.0	06/02/2018	IR	First release

Contents

0. Preface.....	0-1
0.1 About this Document	0-1
0.2 Who Should Read this Publication	0-1
0.3 Assumed Knowledge	0-1
0.4 Notice about Specifications	0-1
0.5 Notice about this Guide	0-1
0.6 Typographic Conventions.....	0-2
0.7 Symbols	0-2
0.8 Trademarks.....	0-2
0.9 Related Documents.....	0-3
0.10 Document History.....	0-3
1. Product Overview	1-1
1.1 Product Family	1-1
1.2 AEON Transmitter	1-1
1.3 AEON Decoder	1-3
1.4 AEON Encoder	1-4
2. Product Package	2-5
2.1 Overview	2-5
2.2 AEON Transmitter Parts List	2-5
2.3 AEON Decoder Parts List	2-5
2.4 AEON Encoder Parts List	2-6
2.5 Accessory Options	2-6
2.6 AEON Transmitter Licensing Options	2-7
2.7 AEON Transmitter Variants	2-7
2.8 Labelling.....	2-8
3. Connections, Controls and Indicators	3-9
3.1 Introduction	3-9
3.2 AEON Transmitter	3-9
3.3 AEON Rack Decoder/Encoder.....	3-15
4. Getting Started	4-17
4.1 Power	4-17
4.2 Access the USB Stick	4-17
4.3 Using Node Finder.....	4-18
4.4 AEON Transmitter Web Browser Control.....	4-20
4.5 Web Browser Options	4-21
4.6 LCD/OLED Display Control.....	4-21
5. AEON Transmitter Web Browser Operation	5-22
5.1 Introduction	5-22
5.2 Unit Status>Overview Tab	5-22
5.3 Unit Status>Service>Status	5-23
5.4 Unit Status>SDI/SFP Tab.....	5-23
5.5 The Apply, Save and Refresh Buttons	5-24
5.6 Configuration>Global Tab	5-24
5.7 Configuration>Preset>Unit.....	5-28
5.8 Configuration>Preset>Encoder Tab	5-30
5.9 Configuration>Preset>Audio Tab.....	5-31

5.10	Configuration>Preset>Data Tab	5-31
5.11	Configuration>Preset>Streamer	5-32
5.12	Configuration>Preset>Modulator Tab	5-34
5.13	Engineering>Information Tab	5-36
5.14	Engineering>Calibration Tab	5-37
5.15	Engineering>Uploads	5-37
6.	AEON Transmitter – SDR Dual Encoder.....	6-38
6.1	Introduction	6-38
6.2	Unit Status>Service>Status Tab	6-39
6.3	Unit Status>Service>PTZ Tab	6-40
6.4	Configuration>Preset>Encoder Tab	6-41
6.5	Configuration>Preset>Audio Tab	6-46
6.6	Configuration>Preset>Data Tab	6-48
6.7	Configuration>Preset>Streamer Tab	6-50
7.	AEON-MESH Web Browser Operation.....	7-54
7.1	Introduction	7-54
7.2	AEON-MESH with AEON Encoder	7-55
7.3	AEON-MESH with SDR Dual Encoder	7-56
8.	AEON Transmitter LCD Display Operation	8-58
8.1	Overview	8-58
8.2	Icons and Controls	8-58
8.3	Navigating the Menu	8-59
9.	AEON Decoder/Encoder Operation.....	9-60
9.1	Introduction	9-60
9.2	OLED Display.....	9-60
9.3	Configurable Values	9-61
10.	Example Applications	10-62
10.1	Single AEON 4K HEVC Encoder	10-62
10.2	MESH Application.....	10-65
11.	Appendix A – Reference Material	11-68
11.1	How to Configure a PC IP Address.....	11-68
11.2	AEON Transmitter Pinouts.....	11-69
11.3	AEON Decoder/Encoder Pinouts.....	11-71
12.	Appendix B – Getting Technical Support	12-72
12.1	Documentation and Software.....	12-72
12.2	Repairs.....	12-72
12.3	Contact Technical Support.....	12-72
12.1	Using the DTC RMA Service.....	12-72
13.	Appendix C – Cautions and Approvals	13-74
13.1	Cautions and Warnings.....	13-74
13.2	EMC/Safety and Radio Approvals.....	13-75
13.3	CE Marking.....	13-75
14.	Appendix D – Care and Maintenance	14-76

14.1	Caring for your Equipment	14-76
14.2	Charging	14-76
14.3	Working with Lithium Batteries.....	14-76
14.4	Cleaning.....	14-77
14.5	Storage.....	14-77
15.	Appendix E – Glossary.....	15-78

1. Product Overview

1.1 Product Family

The subject equipment of this user guide is:

Product Code	Product Description
AEON-TX	AEON HEVC Transmitter
AEON-ENC	AEON 4K Encoder
AEON-DEC	AEON 4K Decoder

1.2 AEON Transmitter



Figure 1-1 AEON Transmitter

Description

A compact and feature-rich COFDM digital video transmitter, 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, as well as SFP+ expansion. Two true balanced audio inputs are included with phantom power. The transmitter has an integrated control panel with sunlight-readable LCD display covering all major functions and has 16 user-defined presets, as well as 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.

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 UMLV modulation for enhanced high frequency/high speed performance
- Controlled via IP or integrated sunlight-readable LCD display
- Designed for sports & events coverage, newsgathering and wireless studio camera applications
- Integrated return channels for bi-direction IP connectivity and low bandwidth telemetry
- Scalable return channel for talk-back to camera control to return video
- Low power consumption and active cooling for extended field performance

Basic Specifications

Dimensions	L 190mm (170mm excluding connectors) W 115mm, (105mm excluding connectors) D 55mm (without battery plates) or D 89mm (with V-Lock plates) or D 82mm (with Anton Bauer plates)
Weight	1600g
DC Input	9.2 to 17.8V reverse polarity protected
Power consumption	Typically 30.0W @ 100mW RF power and 4K video
Temperature range	-10°C to +50°
Humidity	Less than 85% non-condensing

Note: Detailed technical specifications are given in the product datasheet. Please see <http://www.domotactical.com/>.

1.3 AEON Decoder



Figure 1-2 AEON Decoder

Description

The AEON HEVC Rack Decoder provides low latency HEVC Ultra High Definition decoding from ASI/IP input. Ideal for adding decode support for the AEON Transmitter to existing receiver systems. Each decoder can support single 4K or up to two HD streams via quad 3G-SDI outputs, and has two stereo balanced audio outputs available. The decoder has an integrated control panel with sunlight-readable OLED display covering all major functions, as well as 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.

Features

- Ultra-low latency HEVC SD, HD and 4K decoding with Tri-level sync genlock
- Video formats up to 2160p60, 10-bit and 4:2:2 Chroma sampling, future HDR support
- Controlled via IP or integrated sunlight-readable OLED display
- Designed for sports & events coverage, newsgathering and wireless studio camera applications
- Scalable decoding platform supporting single 4K or two HD services
- Low power consumption and active cooling for extended field performance
- Compact 1/2 1RU rack form factor

Basic Specifications

Dimensions	180mm (L), 222mm (W), 43mm (H)
Weight	1155g
DC Input	12V to 17V
Power consumption	Typically 16.0W with 4K decoding
Temperature range	-10°C to +50°
Humidity	Less than 85% non-condensing

Note: Detailed technical specifications are given in the product datasheet. Please see <http://www.domotactical.com/>.

1.4 AEON Encoder



Figure 1-3 AEON Encoder

Description

The AEON HEVC Rack Encoder provides low latency HEVC Ultra High Definition encoding to ASI/IP output. Ideal for adding 4K, multi-channel, HEVC support to existing RF/IP systems. Each encoder can support single 4K or up to 4 HD streams via quad 3G-SDI inputs, and has two stereo balanced audio inputs available with phantom power. The encoder has an integrated control panel with sunlight-readable OLED display covering all major functions, as well as 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.

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
- Controlled via IP or integrated sunlight-readable OLED display
- Designed for sports & events coverage, newsgathering and wireless studio camera applications
- Scalable encoding platform supporting single 4K or four HD services
- Low power consumption and active cooling for extended field performance
- Compact 1/2 1RU rack form factor

Basic Specifications

Dimensions	L 180mm, W 222mm, H 43mm
Weight	1155g
DC Input	12V to 17V
Power consumption	Typically 16.0W with 4K encoding
Temperature range	-10°C to +50°
Humidity	Less than 85% non-condensing

Note: Detailed technical specifications are given in the product datasheet. Please see <http://www.domotactical.com/>.

2. Product Package

2.1 Overview

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

Note: If you don't have all the parts or you are not happy with the condition of your delivered product, please call DTC and we'll get this solved for you. See *Section 12*.

Retain the packing list and all the packing materials for storage. The codes mean:

- CA – Cable Assembly
- SA – Sub Assembly
- AP – Assembly Part

The codes are useful for identification and if you need to order a new part at some time.

2.2 AEON Transmitter Parts List

Part Number	Description
AEON-TX	AEON HEVC Transmitter
CA0579	XLR audio input cable
CA3348	AEON-TX UHD BNC to R/A HD-BNC 1855A 250mm cable
SA4075	AEON HEVC support USB stick consisting: Node Finder application AEON Family User Guide

Table 2-1 Parts in the AEON-TX Package

2.3 AEON Decoder Parts List

Part Number	Description
AEON-DEC	AEON HEVC Rack Decoder
CA0512	XLR audio output cable
CA0649	XLR 12V 6.67A 80W desktop PSU
SA4075	AEON HEVC support USB stick consisting: Node Finder application AEON Family User Guide

Table 2-2 Parts in the AEON-DEC Package

2.4 AEON Encoder Parts List

Part Number	Description
AEON-ENC	AEON HEVC Rack Encoder
CA0579	XLR audio input cable
CA0649	XLR 12V 6.67A 80W desktop PSU
SA4075	AEON HEVC support USB stick consisting: Node Finder application AEON Family User Guide

Table 2-3 Parts in the AEON-ENC Package

2.5 Accessory Options

If you have purchased these options, they will also be in the package.

Part Number	Description
PRORXD-1RU	Professional Receiver 1RU
PRORXD-2RU	Professional Receiver 2RU
SOL8KF-043	Three button key fob (433.05-434.79MHz)
CA0340	RS-232 data input cable
CA3421	0B Lemo 15V 6.0A 90W desktop PSU

Table 2-4 AEON Accessory Options

2.6 AEON Transmitter Licensing Options

The device licensing is viewable from the web browser software control application.

Part Number	Description
Silver (included)	DVB-T, Ultra Mobile Video Link (UMVL), Single HD Encoder
Gold	Silver plus DVB-T2 (future development)
Platinum	Gold plus Single 4K and Quad HD Encoder
AEON-TX-HDUP	Additional transmitter HD license
AES128TX	AES128 encryption
AES256TX	AES256 encryption

Table 2-5 AEON-TX Licensing Options

2.7 AEON Transmitter Variants

Product Code

This part number will be on the AEON-TX label. This will identify which variant has been delivered to you.

Part Number	Product Description
AEON-TX-AB-198750D-044	AEON-TX 1.98-2.70GHz, 6.40-7.50GHz, 410-480MHz telemetry, AB-Mount
AEON-TX-V-198750D-044	AEON-TX 1.98-2.70GHz, 6.40-7.50GHz, 410-480MHz telemetry, V-Mount
AEON-TX-AB-440500-043	AEON-TX 4.40-5.00GHz, 433.05-434.79MHz telemetry, AB-Mount
AEON-TX-V-440500-043	AEON-TX 4.40-5.00GHz, 433.05-434.79MHz telemetry, V-Mount

Table 2-6 AEON-TX Variants

Product Code Frequency

Although most of the product code is self-explanatory, it may be useful to explain the differences in the frequency variants.

Where the COFDM frequency is dual band, the primary frequency will transmit on ports **Tx/RX A** and **Tx/Rx B** and the secondary frequency band will transmit on **Tx C** only. For example:

198750 = 1.98-2.70GHz (Tx/RX A and Tx/Rx B) and 6.40-7.50GHz (Tx C only)

Note: This will be configured using the web browser control application, see *Section 5.12*.

2.8 Labelling

This topic contains information covering labels and markings on your device. The legend and location of each label or marking will be identified and explained for safety or maintenance significant information.

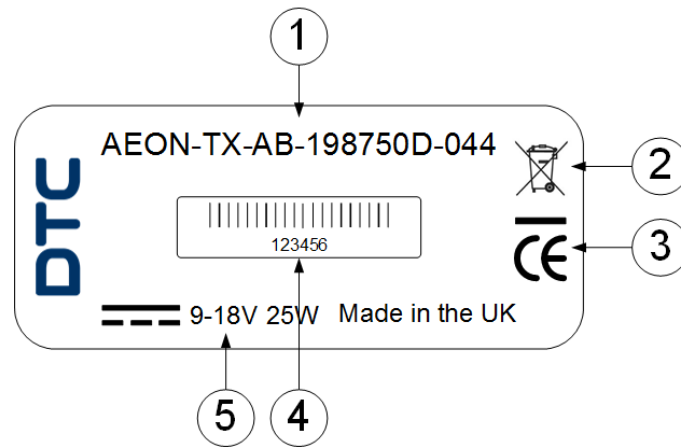


Figure 2-1 AEON Label

No	Description
1	Product code – this will include the product name, battery mount and variant.
2	Indicates that the unit should be disposed of in accordance with the WEEE Directive.
3	The CE marking certifies that a product has met EU consumer safety, health and environmental requirements.
4	Barcoded six digit serial number. This may be required during a support call.
5	Power requirements.

Table 2-7 AEON Label Key

3. Connections, Controls and Indicators

3.1 Introduction

This section will help you identify all the connections and interfaces to help you install and control the AEON Transmitter, Decoder or Encoder.

3.2 AEON Transmitter

The **AEON-TX** has several facets which have been given nominal titles; Top Panel, Bottom Panel, Left Panel (LCD), Right Panel, Camera Mount Plate and Battery Mount Plate.

Top Panel



Figure 3-1 AEON-TX Top Panel

No	Item	Purpose
1	LCD display control button	Button can be rotated and pushed up, down, left and right to navigate the LCD display menu. Left/right moves through the menu levels Up/down changes the menu selection Rotate to change a value Short push to enter a value. <hr/> Note: For full details of LCD display operation, refer to <i>Section 8</i> .
2	SMA socket	Telemetry antenna connector.
3	LED indicator	Power/RF Status: Red = unit has booted up, no RF power Green = RF output on (TX mode) or in link (Mesh mode)

No	Item	Purpose
4	N-type socket	COFDM TX only antenna C connector. Read note below. This port transmits in the secondary frequency band. See <i>Section 2.7</i> . When transmitting in this band, port C is the only TX output.
5	N-type socket	COFDM TX/RX antenna A connector. Read note below. This port transmits in the primary frequency band. See <i>Section 2.7</i> . When transmitting in this band and configured as a SOL-TX, this will be a selectable TX only port. When configured as a MESH, it can become a TX/RX port.
6	N-type socket	COFDM TX/RX antenna B connector. Read note below. This port transmits in the primary frequency band, 1.98–2.7GHz or 4.4–5GHz or 5.5–6GHz. When transmitting in this band and configured as a SOL-TX, this will be a selectable TX only port. When configured as a MESH, it can become a TX/RX port.

Table 3-1 AEON-TX Front Panel Key

Note: The transmit port selection is achieved by selecting the modulation frequency in the web browser control application, see *Section 5.12*.

Bottom Panel

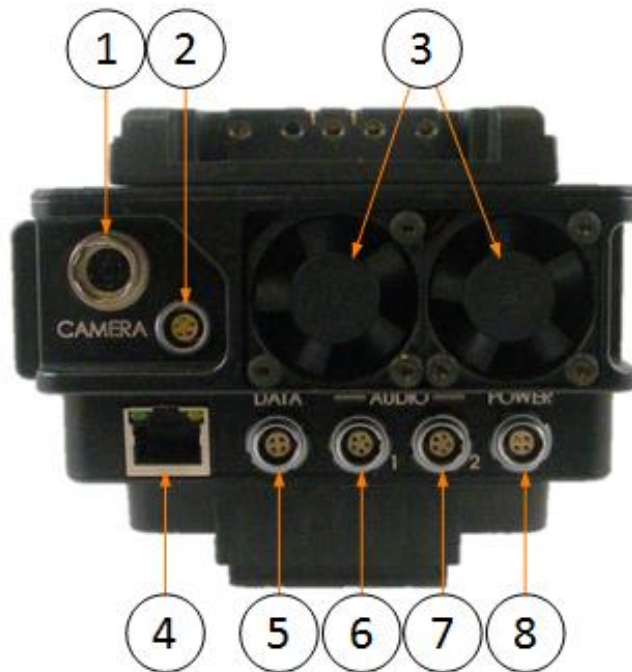


Figure 3-2 AEON-TX Bottom Panel

No	Item	Purpose
1	Hirose 10-way jack (pins)	Data and power to the camera. See <i>Section 11.2</i> for pinout.
2	Lemo 0B, single G key, 5-way jack (sockets)	Tally light control. See <i>Section 11.2</i> for pinout.
3	Fans	Provides cooling for internal components. Take care not to obstruct.
4	RJ45 jack	Ethernet connection for IP control and video streaming.
5	Lemo 0B, 4-way jack (sockets)	RS-232 data interface. See <i>Section 11.2</i> for pinout.
6	Lemo 0B, twin A key, 5-way jack (sockets)	Channel 1 balanced left and right audio input with switchable 48V phantom power. See <i>Section 11.2</i> for pinout.
7	Lemo 0B, twin A key, 5-way jack (sockets)	Channel 2 balanced left and right audio input with switchable 48V phantom power. See <i>Section 11.2</i> for pinout.
8	Lemo 0B, single G key, 4-way jack (sockets)	12V DC input (9.2V – 17.8V). See <i>Section 11.2</i> for pinout.

Table 3-2 AEON-TX Bottom Panel Key

Right Panel



Figure 3-3 AEON-TX Right Panel

No	Item	Purpose
1	High density BNC socket x 2	ASI video In and Out. Note: ASI IN can be set up as an SDI input when the AEON Transmitter is configured as an SDR Dual Encoder in the web browser application (see <i>Section 6</i>) as long as the ASI IN is not being used for Remux.
2	3.5mm jack socket x 2	Microphone and headphone audio for talkback.
3	High density BNC socket x 4	SDI video input 1. Supports 12G-SDI (single input), 6G-SDI (dual input) or 3G-SDI (quad input). The supplied CA3348 cables will adapt the HD-BNC connectors to BNC. SDI video input 2. Supports 3G-SDI (quad input). The supplied CA3348 cables will adapt the HD-BNC connectors to BNC. SDI video input 3. Supports 6G-SDI (dual input) or 3G-SDI (quad input). The supplied CA3348 cables will adapt the HD-BNC connectors to BNC. SDI video input 4. Supports 3G-SDI (quad input). The supplied CA3348 cables will adapt the HD-BNC connectors to BNC.
4	USB jack	USB host or peripheral device connection.
5	SFP+ jack	Can be used for a single 12G-SDI or dual 6G-SDI input. Note: This will override SDI input 1 when using 12G-SDI. One channel may be used in conjunction with SDI input 1 or 3 when using 6G-SDI as a dual input.
6	D-tap supply	This terminal can tap up to 50W of power from the battery for auxiliary use.

Table 3-3 AEON-TX Right Panel Key

Left Panel (LCD)

Note: For full details of LCD display operation, refer to *Section 8*.

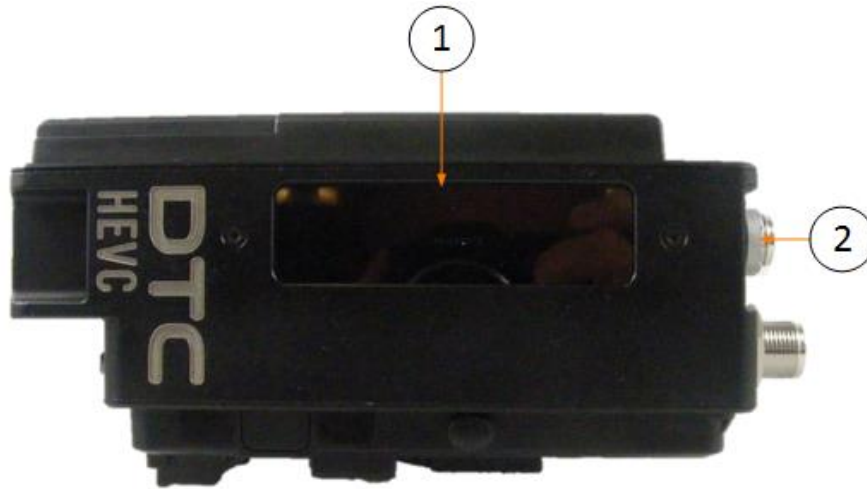


Figure 3-4 AEON-TX Left Panel

No	Item	Purpose
1	LCD display	A sunlight-readable LCD display covering all major functions.
2	LCD display control button	Use this button to navigate the LCD display menu.

Table 3-4 AEON-TX Left Panel Key

Camera Mount Plate

The AEON-TX camera mount plate will assemble the AEON-TX to the camera. The AEON-TX will have either an AB or V mount option.

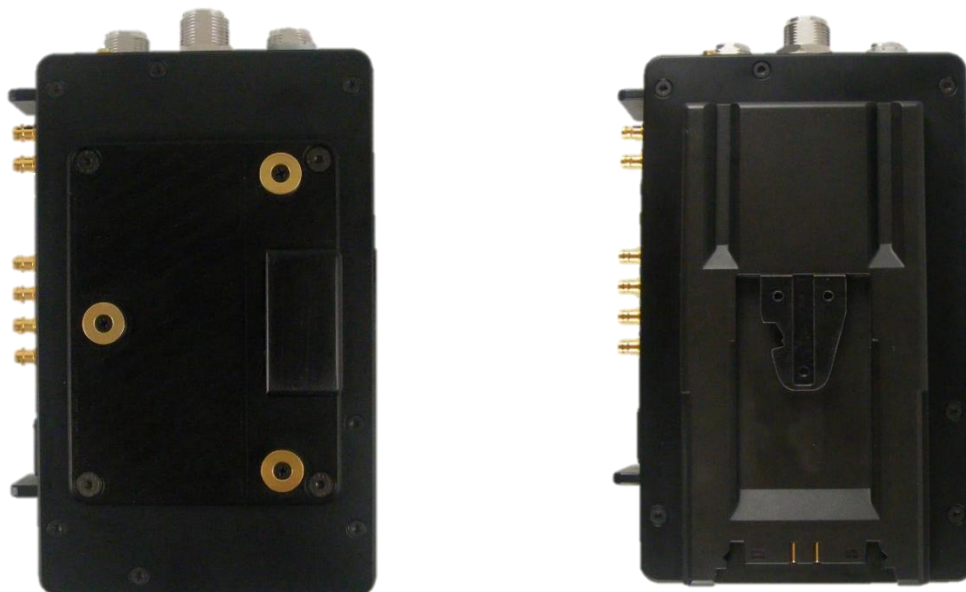


Figure 3-5 AB Camera Mount (left) and V Camera Mount (right)

Battery Mount Plate

The AEON-TX battery mount plate will assemble the battery to the AEON-TX. The AEON-TX will have either AB or V mount option.

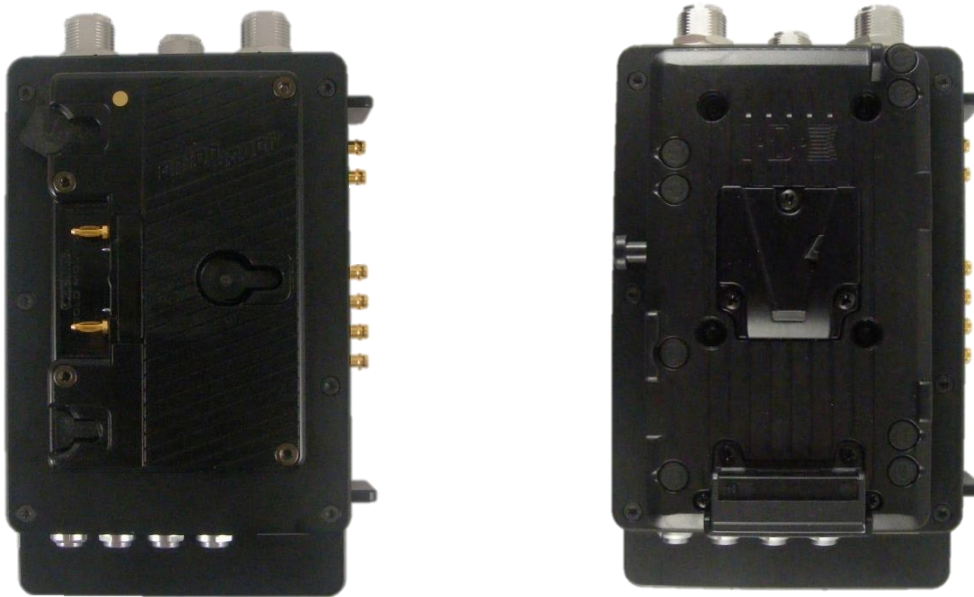


Figure 3-6 AB Battery Mount (left) and V Battery Mount (right)

3.3 AEON Rack Decoder/Encoder

Front Panel

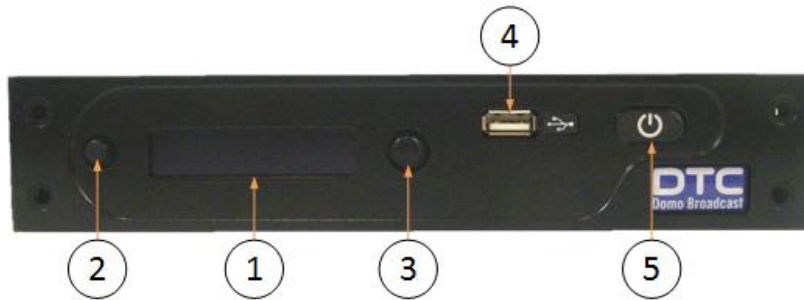


Figure 3-7 AEON Decoder/Encoder Front Panel

No	Item	Purpose
1	OLED display	A sunlight-readable OLED display covering all major functions.
2	Cancel button	Each time you push the button, the menu moves back a level.
3	Navigation button	Push the Navigation button to select menus or options. Move the button up and down to move between menus or change options. Move the button left and right to select numbers/letters when editing values.
4	USB jack	USB host or peripheral device connection.
5	Power button	Push to toggle the power on or off.

Table 3-5 AEON Decoder/Encoder Front Panel Key

Rear Panel

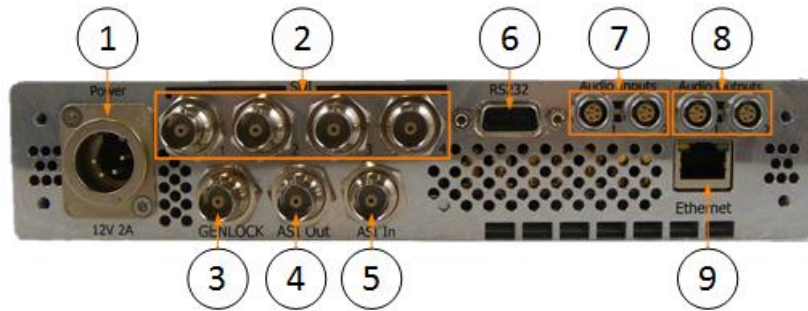


Figure 3-8 AEON Decoder/Encoder Rear Panel

No	Item	Purpose
1	XLR 4-way jack (pins)	Use the supplied CA0649 PSU to supply 12V DC input (9V – 18V) to the unit.
2	BNC jack (socket) x 4	3G-SDI video output/inputs. Outputs for the Decoder . Inputs for the Encoder . Note: The Decoder outputs currently only support 3G-SDI Level A signals.
3	BNC jack (socket)	Genlock input to keep the receiver synchronised with all the other equipment in your facility. Note: Future development on the Encoder.
4	BNC jack (socket)	ASI video output.
5	BNC jack (socket)	ASI video input. Note: Future development on the Encoder.
6	9-way D-type connector (sockets)	RS-232 data communications; Input – Encoder; Output – Decoder. See <i>Section 11.3</i> for pinout.
7	5-way Lemo jack (sockets) x 2	Encoder only – channel 1 and 2 balanced left and right audio input with switchable phantom power, use supplied CA0579 cable. See <i>Section 11.3</i> for pinout.
8	5-way Lemo jack (sockets) x 2	Decoder only – channel 1 and 2 balanced left and right audio output, use supplied CA0512 cable. See <i>Section 11.3</i> for pinout.
9	RJ45 jack	Ethernet connection for IP control.

Table 3-6 AEON Decoder/Encoder Front Panel Key

4. Getting Started

These instructions give the information required to power up and control an AEON device.

4.1 Power

AEON Transmitter

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

Power can be supplied to the AEON Transmitter in two ways:

- Via a battery – AB or V mount depending on the device battery mounting plate
- Via 9.2–17.8VDC input to the power connector on the bottom panel

AEON Decoder/Encoder

Power to the AEON Encoder or Decoder is supplied via the 12–17V DC input on the rear panel via the supplied **CA0649** 12V PSU. Power on/off is controlled by the front panel switch.

Push and release to switch on, the switch will latch. Push and release to switch off, the switch will unlatch.

4.2 Access the USB Stick

The USB support stick includes this user guide plus **Node Finder**, an application which you will need to establish the AEON Transmitter IP address.

1. Plug the USB stick into the USB port of your PC.
2. The USB stick device drivers will load the first time you plug it in to your PC. Wait for the drivers to load successfully, you should see the progress in the bottom right of your PC screen.
3. Once they have loaded, a USB drive will have been created. Open Windows Explorer and you will be able to view the USB stick contents.

4.3 Using Node Finder

Introduction

Our devices are shipped to you with the IP DHCP setting enabled. This means that if the AEON Transmitter is connected to a network which is administered by a DHCP server, the IP address will be automatically allocated to it.

Node Finder can be used to identify a device IP address, or disable DHCP if you are not connected through a DHCP server or using a standalone PC or laptop.

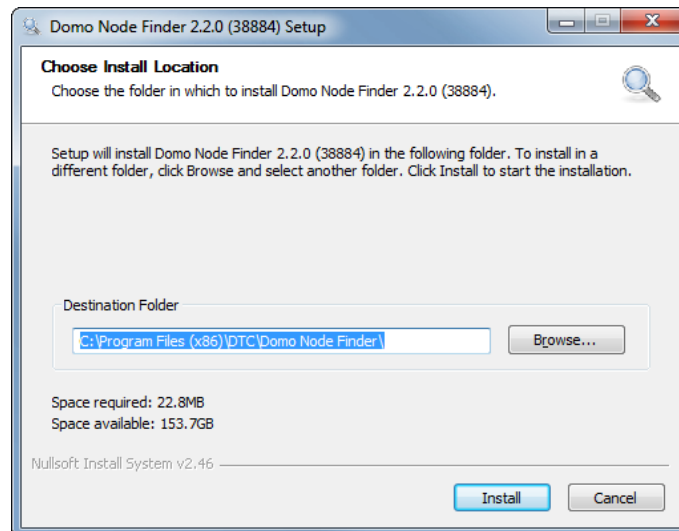
If you are unsure about your server settings, check with your Network Administrator.

Note: If you are using a standalone PC or laptop, you will also need to set the IP address of the PC. Refer to *Section 11.1* to find out how to do this.

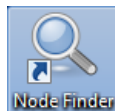
If the DTC device is connected to a network which does **not** have a DHCP server, contact your Network Administrator for an IP address you can use.

Install Node Finder on your PC

1. Double click the **NodeFinder.exe** file from the USB drive on your PC.
2. The **Node Finder Setup** window opens.



3. **Browse** to the location where you wish to install the software or leave the **Destination Folder** at default (recommended).
4. Click the **Install** button.
5. On completion **Close** the installer. A Node Finder icon will appear on your desktop.



Establish the AEON Transmitter's IP Address using Node Finder

1. Power up the AEON Transmitter using one of the methods explained above.
2. Double click the newly installed Node Finder icon from your PC desktop.
3. Find the AEON Transmitter IP address from the Node Finder list.

Note: If the device is not connected to a network with a DHCP server, the IP address may appear as 0.0.0.0.

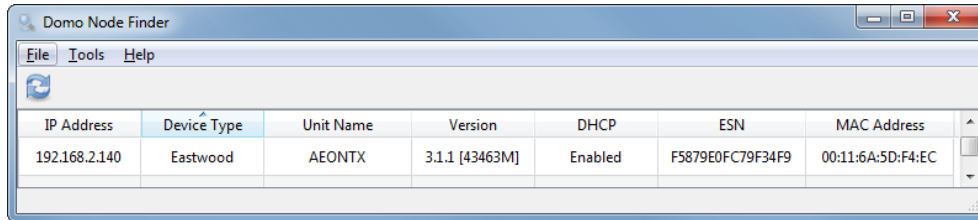


Figure 4-1 Node Finder Showing an AEON Transmitter

4. Right click on the IP address and select **Configure Network** to disable DHCP and set a fixed IP address, if required. The **IP Address** should be on the same address range as the network or standalone PC, the **Subnet Mask** should be left at 255.255.255.0 and the **Default Gateway** can be 0.0.0.0.

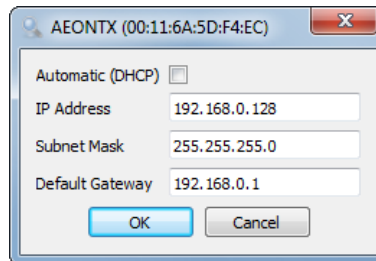


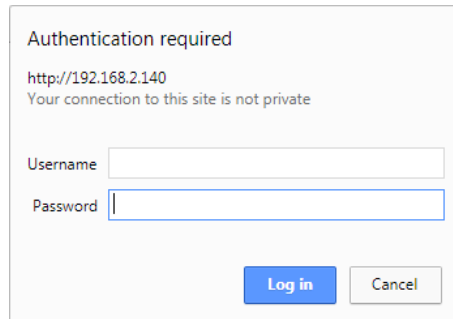
Figure 4-2 Node Finder IP Address Configuration

4.4 AEON Transmitter Web Browser Control

Now the IP address has been established, you can use a web browser to configure and monitor the AEON Transmitter.

Note: Although all web browsers may work with AEON devices, some operations cannot be guaranteed. DTC strongly recommend the use of Google Chrome.

1. Open a web browser and enter the IP address of the AEON device in the address bar.
2. An authentication required dialogue box will open.



Authentication required

http://192.168.2.140
Your connection to this site is not private

Username

Password

3. The Password is **aeonweb** which is case sensitive. The Username should be left blank
4. Click **Log in**, the web browser control application opens.

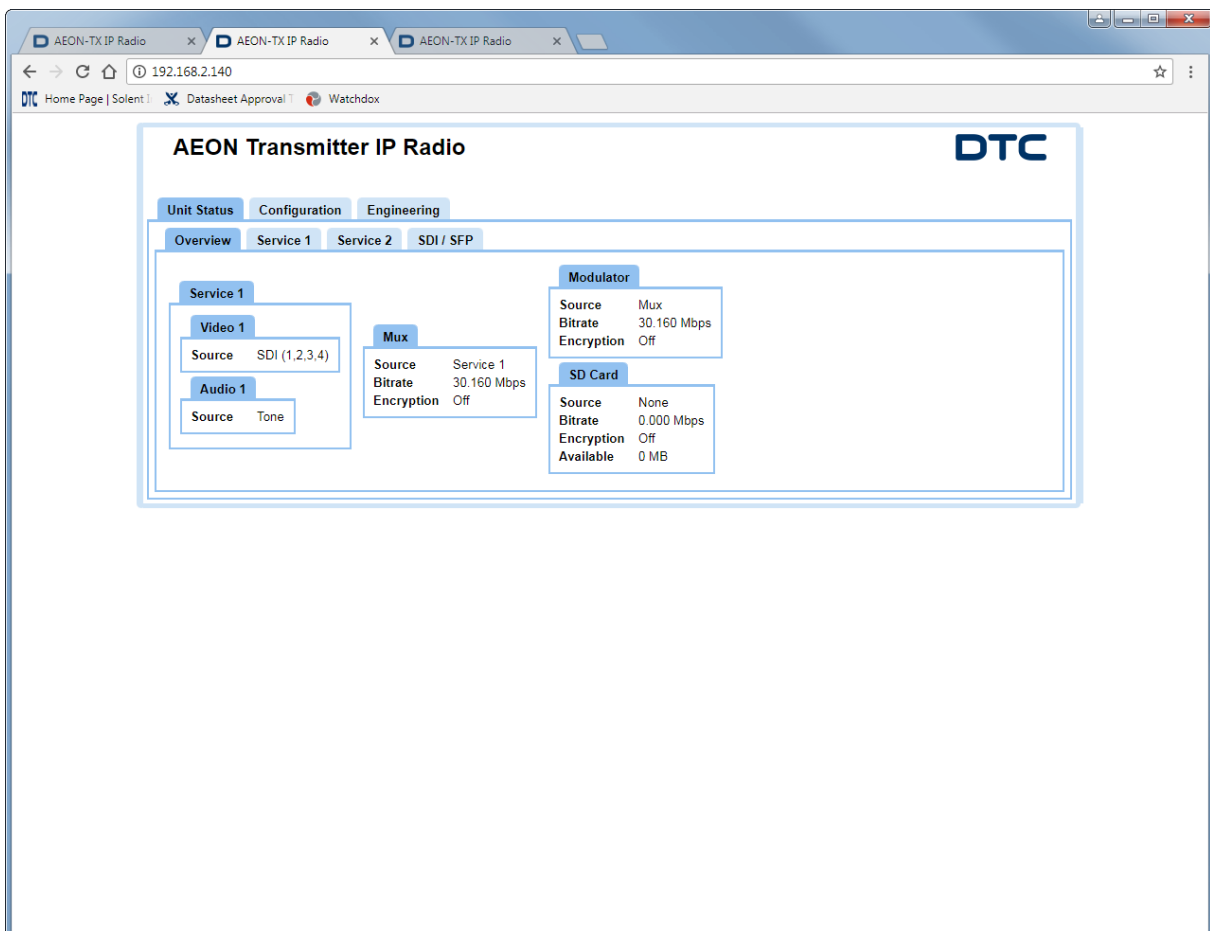


Figure 4-3 Web Browser Communications with an AEON Transmitter

4.5 Web Browser Options

The web browser display options will change depending on the modes that are set. The guides that follow will explain the differences where applicable:

- *AEON Transmitter Web Browser Operation*
- *AEON Transmitter – SDR Dual Encoder*
- *AEON-MESH Web Browser Operation*

4.6 LCD/OLED Display Control

The AEON Transmitter, Encoder and Decoder can be operated from an integral LCD/OLED display via control buttons.

For details on LCD display control for the Transmitter, refer to *Section 8* and for Decoder/Encoder OLED display, refer to *Section 9*.

5. AEON Transmitter Web Browser Operation

5.1 Introduction

AEON Transmitters can be controlled from a **web browser** application via an Ethernet to setup pre-deployment configurations.

Note: Although all web browsers may work with AEON Transmitter, some operations cannot be guaranteed. DTC strongly recommend the use of **Google Chrome**.

This section explains the web browser operation, explaining each parameter. It will help you understand how to operate the AEON Transmitter to optimise performance.

Note: There are some configurations that will change the selections sufficiently to warrant separate explanation. Please see *Section 6* when in Dual SDR mode and refer to *Section 7* when you configure the AEON Transmitter to MESH application.

5.2 Unit Status>Overview Tab

The Overview tab shows status information. The displayed information may depend on what functions have been enabled.

AEON Transmitter IP Radio
DTC

Unit Status
Configuration
Engineering

Overview
Service 1
Service 2
SDI / SFP

Service 1

Video 1

Source SDI (1,2,3,4)

Audio 1

Source Tone

Mux

Source Service 1

Bitrate 30.160 Mbps

Encryption Off

Modulator

Source Mux

Bitrate 30.160 Mbps

Encryption Off

SD Card

Source None

Bitrate 0.000 Mbps

Encryption Off

Available 0 MB

5.3 Unit Status>Service>Status

The Service tab shows video status information. The Service 1 and Service 2 tabs display the status of the respective services.

Property	Description
Status	Colour coded video and audio status. White – not configured; Red – not locked to source; Green – locked to source

5.4 Unit Status>SDI/SFP Tab

The SDI/SFP tab gives an overview of the ‘gearing’ of the video inputs to outputs.

5.5 The Apply, Save and Refresh Buttons

The **Global** and **Configuration** tabs have the **Apply**, **Save** and **Refresh** buttons. It is useful to know the differences and important to remember to click Apply or Save when any changes are made.

Apply Button

Click **Apply** in the bottom left of the screen to save the changes you have made. This will also make the preset active.

Save Button

Changes can be made to non-active presets by clicking **Save**. The green highlighted box will show which preset configuration is active.

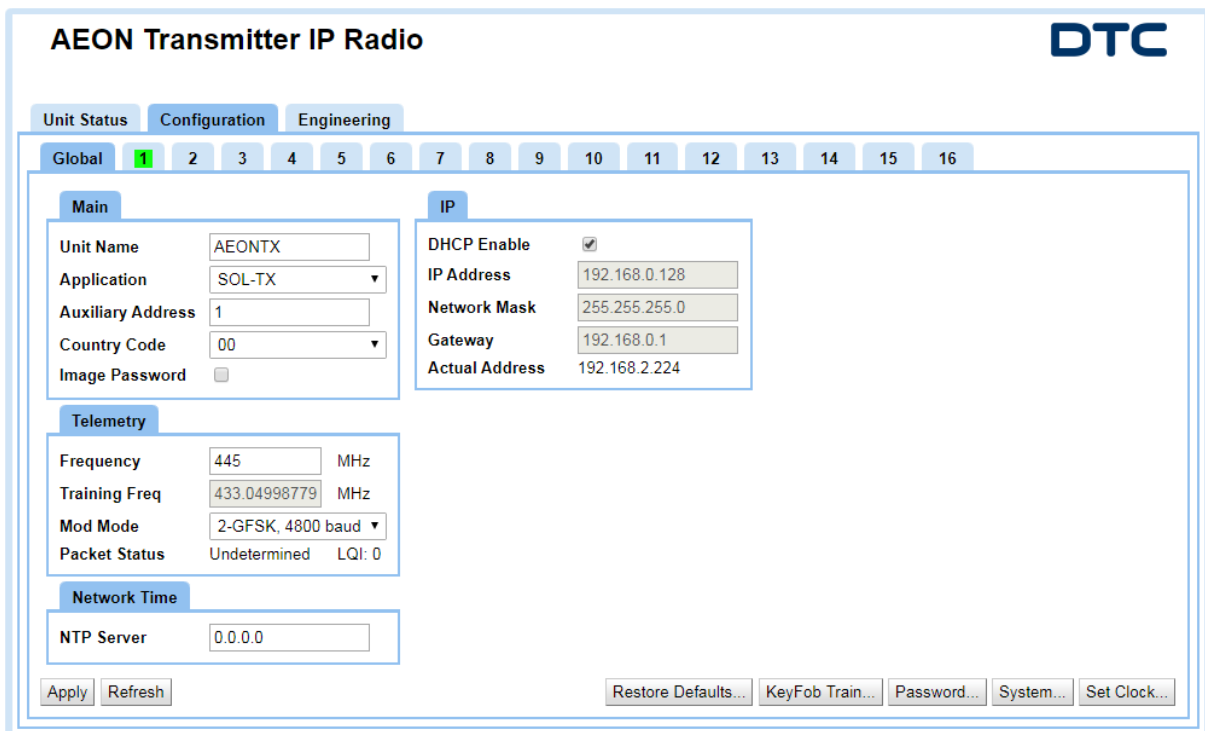
Refresh Button

If you make changes to parameters but do not click **Apply** or **Save**, you can click the **Refresh** button to return the screen to the current settings.

5.6 Configuration>Global Tab

The Global allows you to change parameters which do not affect the preset settings.

If a 4G dongle is inserted into the USB port, **Eth1 (modem)** parameters will appear in the tab.



Main Parameters

Property	Value	Description
Unit Name	Up to 40 alphanumeric characters	The unit name can be a friendly name to identify your AEON Transmitter.

Property	Value	Description
Application	MESH SOL-TX	<p>You can use this field to change the application of the AEON Transmitter if it has both license applications applied.</p> <p>When in SOL-TX mode, the unit RF ports are all TX only.</p> <p>When in MESH mode, the unit RF ports A and B become transceivers. The device can be combined in a fluid self-healing Mesh network containing up to 16 nodes.</p> <p>Note: For detailed MESH user instructions you will have to refer to <i>NETNode Phase 5 Software User Guide</i>.</p>
Auxiliary Address	Default 1	It is recommended that this is left at the default value.
Country Code	ISO 3166-1 Alpha-2 code	If you are using a Wi-Fi dongle, you will need to select the country code to assist with channel selection.
Image Password	Set or clear	If this is checked, it will ask for the AEON Transmitter password if an image is copied.

Telemetry Parameters

Property	Value	Description
Frequency	A frequency in the range of the telemetry receiver	The frequency range for the telemetry receiver is defined by the part number of the unit.
Training Freq	Auto set	The frequency for the key fob transmitter.
Mod Mode	2-GFSK, 4800 baud	Only one Mod Mode is currently available.
Packet Status	Information only	Displays the current Received Signal Strength Indication (RSSI) and Link Quality Indicator (LQI) of the telemetry signal.

Network Time

Enter a Network Time Protocol (NTP) server IP address for clock synchronization to UTC time.

The default address is 0.0.0.0, in this condition there is no clock synchronisation.

IP Parameters

Our devices are shipped to you with the DHCP setting enabled. This means that if the AEON Transmitter is connected to a network which is administered by a DHCP server, an IP address will be automatically allocated to it.

If you are unsure about your server settings, check with your Network Administrator.

Note: If you are using a standalone PC or laptop, you will need to disable DHCP and set the IP address of the PC. Refer to *Appendix A – Reference Material* to find out how to do this.

The following table details the IP parameters of the Global tab.

Parameter	Value	Description
DHCP Enable	Set or clear	If selected, a DHCP server on the network will allocate an IP address. If clear, the IP Address , Network Mask and Gateway parameters will need to be set manually.
IP Address	Example: 192.168.2.120	Type an IP address in the text box.
Network Mask	Example: 255.255.255.0	Type a Network Mask in the text box. The Network Mask lets a network administrator divide a network into smaller more efficient subnets to stop large numbers of IP packets being routed through the network.
Gateway	Example: 192.168.2.254	Type a Gateway address in the text box. A gateway is used by a host when an IP packet's destination address belongs outside the local subnet. The default gateway address is usually an interface belonging to the LAN's router.
Actual Address	Indication only	This is the actual IP address that is allocated to the AEON Transmitter by the DHCP server or if set manually.

4G LTE USB Dongle

When a 4G LTE USB Dongle is inserted in the USB port, an **Eth1 (modem)** tab will appear.

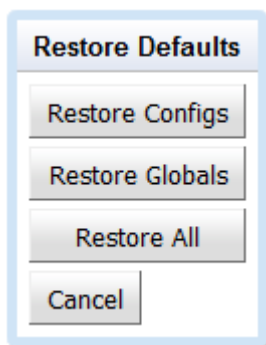
Parameter	Value	Description
Enable	Set or clear	When this is set, this will allow you to edit the IP settings.
Stream on Eth1	Set or clear	When this is set, this will allow you to stream over a 4G LTE network.
Local IP Address	192.168.8.2	This is the IP address of the 4G LTE dongle.
Local Network Mask	255.255.255.0	This is the network mask of the 4G LTE dongle.
Gateway	192.168.8.1	This is the gateway address for the 4G LTE dongle.

Note: When you stream using the 4G dongle you will need to configure the Streamer settings accordingly.

Restore Defaults Button

Restore Defaults...

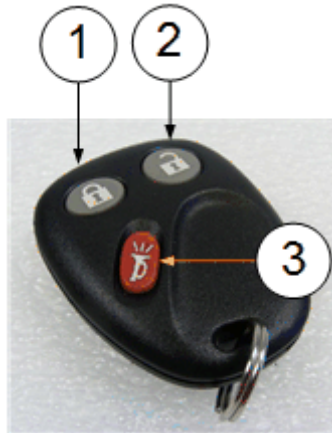
If you click on the **Restore Defaults** button a dialog box opens:



- **Restore Configs** – restores the sixteen configurations to factory default conditions
- **Restore Globals** – restores the Global settings to factory default conditions
- **Restore All** – restores Global settings and all configurations to factory default conditions

KeyFob Train Button

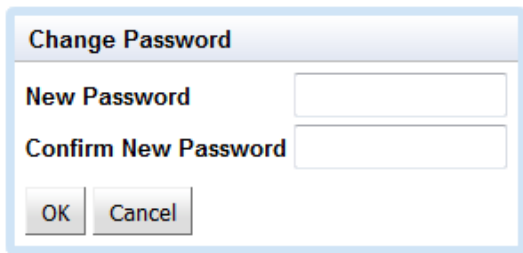
Key Fob Training lets you link a key fob to your transmitter so that they can operate together. Click this button to transfer the settings from the *Key Fob Pane* to the key fob.



1. Push button 2 and button 3 at the same time.
2. The key fob gives three buzzes.
3. Some seconds pass and the key fob gives two buzzes to indicate pairing is successful.

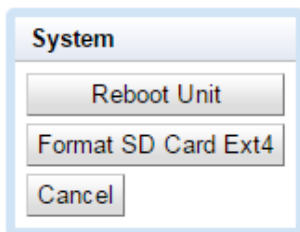
Password Button

Password... The Password button allows you to change the password for the AEON Transmitter. If you click on it, the Change Password dialogue box opens:



System Button

System... The AEON Transmitter has an SD card which allows the user to store recordings. If you click on the System button, a dialogue box opens:



- **Reboot Unit** – will force a reboot of the AEON Transmitter
- **Format SD Card Ext4** – will format your SD card in the file system used by Linux.

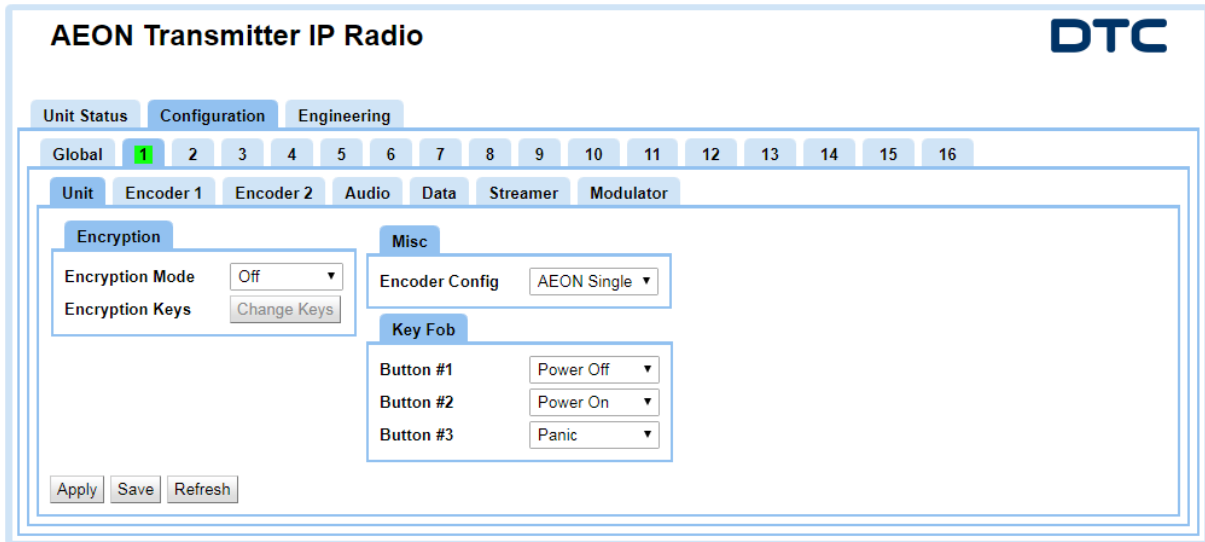
CAUTION: When you format an SD card it will delete all contents.

Set Clock Button

Set Clock... Click on the Set Clock button to set the date and time to UTC time.

5.7 Configuration > Preset > Unit

There are up to sixteen different preset **Configurations** that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.



Encryption Pane

It may be very important to scramble video and audio before they are passed across networks.

Note: Encryption modes except ABS are licensed. If there is an encryption mode you want but does not appear in the list, contact your DTC representative.

Property	Value	Description
Encryption Mode	Off, ABS AES128, AES256 CCrypt, CCrypt256	Click on the box and select your encryption mode from the dropdown list. The options will be license dependent. Note: CCrypt encryption are included with the AES encryption license.
Encryption Keys	<input type="button" value="Change Keys"/>	If you click on this button the Scrambling Key dialogue box will open. Enter the encryption key for your system. When you click OK remember you will still need to click Apply to activate the encryption.

Misc Pane

Property	Value	Description
Encoder Config	SDR Dual AEON Single AEON Quad	When configured in AEON mode, the transmitter is capable of encoding HEVC (H.265) video. When configured as SDR Dual , the transmitter is switched to a dual H.264 encoder with compatible operation to a DTC SOL8SDR device. The web browser selections will change significantly, see <i>Section 6</i> for alternate configurations.

Key Fob Pane

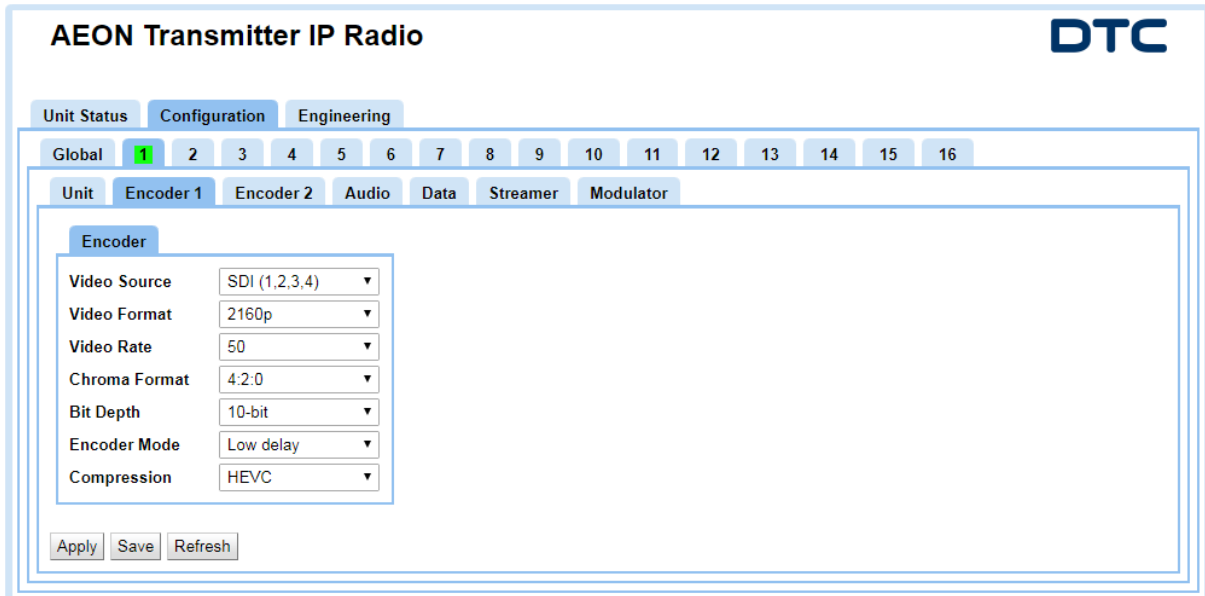
Property	Value	Description
Button #1 Button #2 Button #3	No Operation Power Off Power On Mod Off Mod On Panic	The AEON Transmitter can be remotely controlled with a key fob. Each button can be configured for a different function, see <i>Figure 5-1</i> . The Key Fob settings can be transferred to the key fob by clicking the <i>KeyFob Train</i> Button.



Figure 5-1 Key Fob Buttons

5.8 Configuration > Preset > Encoder Tab

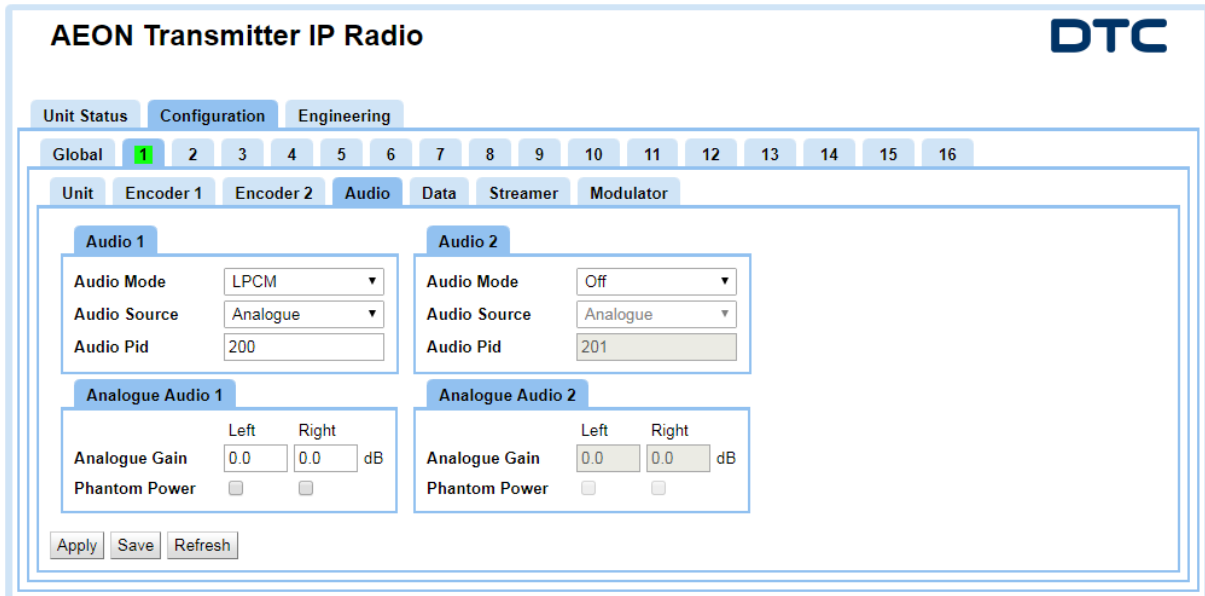
There are up to sixteen different preset **Configurations** that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.



Property	Value	Description
Video Source	SDI (1,2,3,4)	Select the video input source
Video Format	480i, 576i, 480p, 576p, 720p, 1080i, 1080p, 1080psf, 2160p	Select the video format.
Video Rate	23.976, 24, 25, 29.97, 30, 50, 59.94, 60	Select the video frame rate.
Chroma Format	4:2:0 4:2:2	Select the level of chroma sampling required.
Bit Depth	8-bit 10-bit	Select the number of bits per pixel.
Encoder Mode	Standard delay Low delay	Select the level of delay. Standard delay provides higher picture quality at the expense of delay. Low Delay provides very low delay at the expense of picture quality.
Compression	HEVC AVC MPEG2	When the AEON Transmitter encoder config is set to AEON Single , the encoding mode will always be HEVC.

5.9 Configuration > Preset > Audio Tab

There are up to sixteen different preset **Configurations** that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.



Audio

Property	Value	Description
Audio Mode	Off LPCM AAC MP2	Select the audio format.
Audio Source	Analogue Embedded Tone	Select the audio source. A test tone can be selected which is generated internally by the AEON Transmitter.
Audio Pid	Default 200	This sets the PID for the audio content in the Service. The Audio PID is listed in the PMT (see <i>Section 5.11</i>).

Analogue Audio

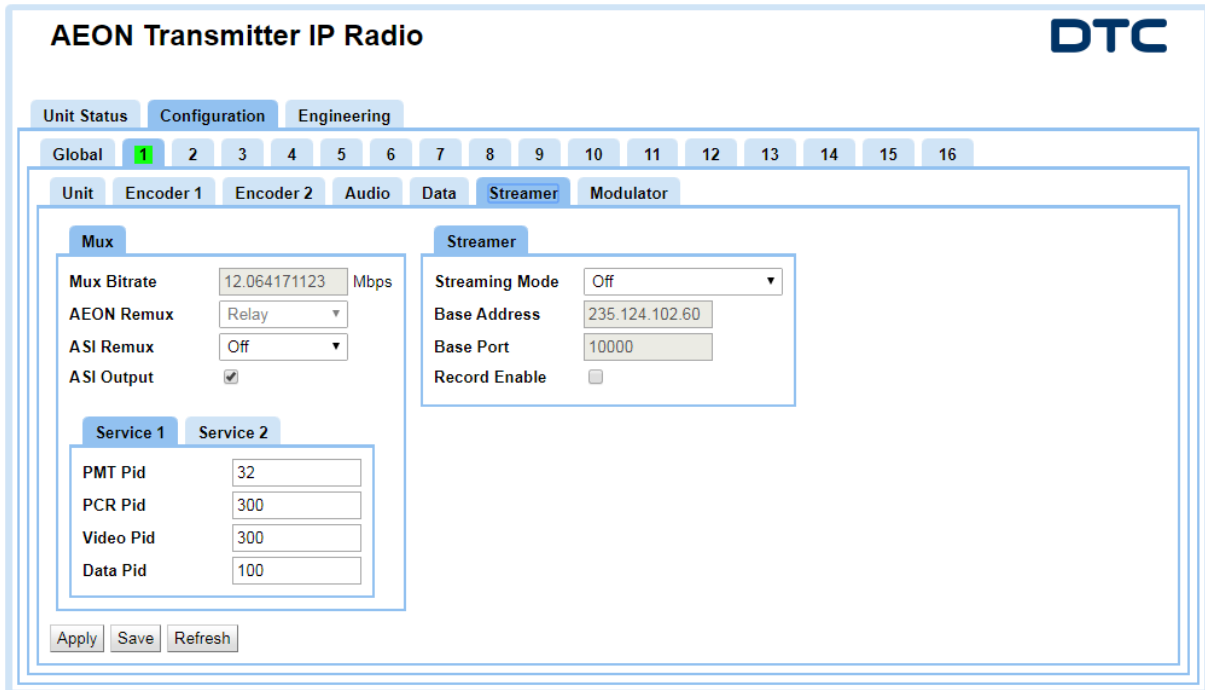
Property	Value	Description
Analogue Gain	Up to 40dB	Gain can be applied at the left and right inputs if the source is at low level.
Phantom Power	Set or clear	When set, this will apply 48V phantom power to the microphone, if required.

5.10 Configuration > Preset > Data Tab

Not currently available when the encoder is configured in **AEON Single** mode.

5.11 Configuration>Preset>Streamer

There are up to sixteen different preset **Configurations** that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.



Mux Pane

The Mux Pane has settings relating to the Mux and Program properties.

Property	Value	Description
Mux Bitrate	Up to 50Mbps/s	The multiplexer bitrate for the service. If the Modulation is set to Off, this can be set manually.
AEON Remux	Relay	Set by default to Relay mode. This means that only services encoded by the AON Transmitter can be streamed.
ASI Remux	Off	ASI Remux cannot be set.
ASI Output	Set or clear	When set, the ASI output will contain the same content sent over the modulator.
PMT Pid	32 to 8190	This sets the packet id for the Program Map Table. For each Program, there is one PMT. These can be edited but should be left to default unless an advanced user.
PCR Pid	32 to 8190	This sets the packet id for the Program Clock Reference which is used to sync the audio and video. The PCR PID is listed in the PMT. These can be edited but should be left to default unless an advanced user.

Property	Value	Description
Video Pid	32 to 8190	This sets the packet id for the video content in the Program. The Video PID is listed in the PMT. These can be edited but should be left to default unless an advanced user.
Data Pid	32 to 8190	This sets the packet id for the data content in the Program. The Data PID is listed in the PMT. These can be edited but should be left to default unless an advanced user.

Note 1: The mux bitrate must be equal to or greater than the total bit rate of services and inputs. If the total bit rate exceeds the mux bitrate the output stream won't work.

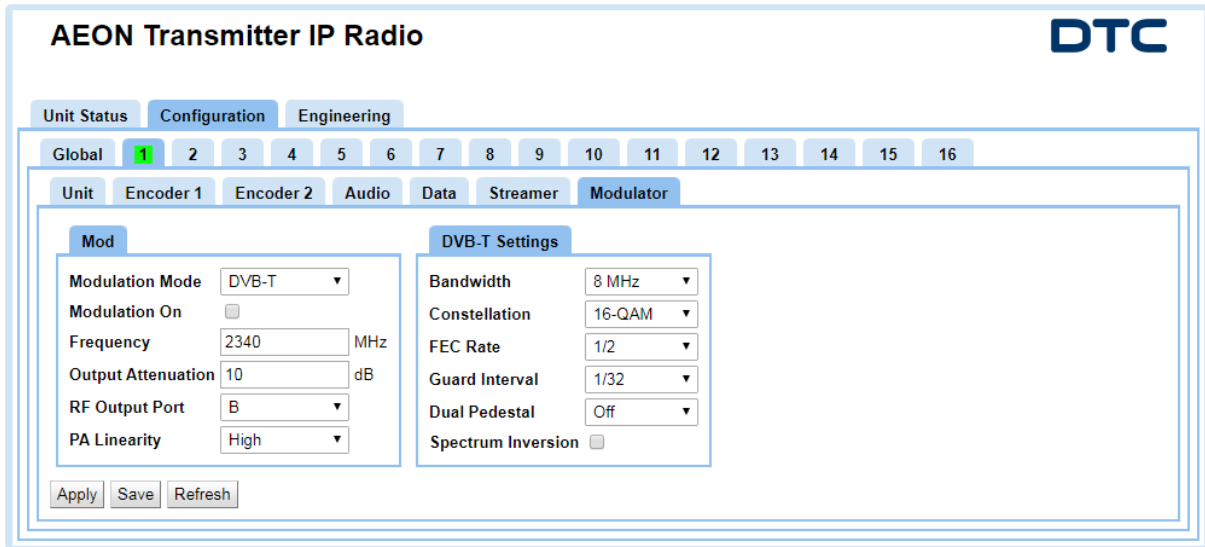
Note 2: If you set ASI Remux to Relay it disables the video source for that channel. You must switch ASI Remux Off when you want to reselect a video source.

Streamer Pane

Property	Value	Description
Streaming Mode	Off UDP RTSP Unicast RTSP Multicast RTP RTP-Z	Select the streaming mode you wish to operate with. Streams can be played back using VLC or Domo Video Player (requires a license). Note: RTP-Z is DTC's compressed RTP. You will need Domo Video Player to run streams using this protocol.
Base Address	For example: 237.103.227.228	This enables you to change the address used by the unit for streaming. The default value is random to make sure different transmitters have different multicast addresses.
Base Port	10000 or above	UDP uses port numbers in the header to direct traffic around the network. A good rule is to use numbers above 10000 to avoid conflict with existing services. When you set up a port number on several computers on a network they will all listen for packets directed to that port.
Record Enable	Set or clear	When you select this box, the video will be recorded to the built in SD card.

5.12 Configuration>Preset>Modulator Tab

There are up to sixteen different preset **Configurations** that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.



Mod Pane

Property	Value	Description
Modulation Mode	None DVB-T NB/UMVL	Set the Modulation Mode for your system. When you set this, the Settings pane will change accordingly to DVB-T or NB/UMVL Settings .
Modulation On	Set or clear	Sets the RF output On or Off.
Frequency	Determined by unit variant.	Type in the frequency you wish to use for the system. This must be the same on the receiver. When you use a frequency in the primary COFDM band, RF ports A and B are active. When you use a frequency in the secondary frequency band, RF port C becomes active. Note: The primary and secondary frequency bands are defined by the transmitter variant. See <i>Section 2.7</i> .
Output Attenuation	0 to 32	Attenuation can be applied to the output of the transmitter.
RF Output Port	A B A+B C	The transmitter has three COFDM antennas, A , B and C . When transmitting in the primary COFDM band, B is selected as the output antenna by default but you can select A or A+B if required. When transmitting in the secondary COFDM band, C will be selected automatically and greyed out.

Property	Value	Description
PA Linearity	High Low	High linearity, improves COFDM shoulder performance at the expense of power consumption. Usually used when working with power amplifiers which must have excellent shoulder performance, or for improved adjacent channel performance.

DVB-T or NB/UMVL Settings Pane


Note: The properties of this pane will change depending on the **Modulation Mode** selected. Some of the options may not be available for the selected Mode.

Property	Value	Description
Bandwidth	625kHz 1.25MHz 2.5MHz 6MHz 7MHz 8MHz	DVB-T modes give excellent data throughput but shorter range than Narrowband modes. Narrowband modes give excellent range and best use of available channel bandwidth. Ultra Mobile Video Link modes give higher data throughput than Narrowband by using the same bandwidths as DVB-T. UMVL will give an advantage over DVB-T at C/X-band in short range mobile environments.
Constellation	QPSK 16-QAM 64-QAM BPSK 8-PSK	The COFDM constellation in use. QPSK, BPSK and 8-PSK - less user data, more robust, more range. 16QAM - more user data, less robust, less range (link performance reduced by 5db). 64QAM - max user data, least robust, least range.
FEC Rate	1/2 1/3 2/3 3/4 5/6 7/8	The forward error correction (FEC) rate. 1/2 means 1 bit out of 2 bits is data and thus 1 bit is used for error correction. 7/8 means 7 bits out of 8 bits are data and thus 1 bit is used for error correction. More user data means better picture quality, but less error correction means less robust signal and thus less range.
Guard Interval	1/32 1/16 1/8 1/4	The guard interval is an extension of the RF symbol period to give immunity to reflections. 1/32 deals with fast reflections, more data, less range. 1/4 deals with slower reflections, less data, more range.

Property	Value	Description
Dual Pedestal	Off Single Port Dual Port	<p>Only available in DVB-T. Dual Pedestal mode will double the bitrate by using two adjacent COFDM channels with 1MHz separation. i.e. DVB-T 8MHz in dual pedestal mode will give a total bandwidth of 17MHz.</p> <p>Single Port (A or B OR A+B) – 100mW output for both channels on a single port.</p> <p>Dual Port (A+B) – 100mW output for each channel on both ports (200mW total).</p> <p>Note: Dual port (A+B) will give the best adjacent channel performance at higher power but will produce more heat. Ensure sufficient cooling is provided.</p>
Spectrum Inversion	Set or clear	You would only set this if you needed to invert the COFDM spectrum.

5.13 Engineering>Information Tab

The **Information** tab provides software and licensing information that may be useful during a service call. It also gives voltage and temperature measurements of the internal PCBs for monitoring.

AEON Transmitter IP Radio


Unit Status
Configuration
Engineering

Information
Calibration
Uploads

Board Type D750

SW Version 4.0.1

SW Branch /SDR/candidates/v4.0.1

SVN Revision 43995

Serial Number 90DC4DFA648A4C16

MAC Address 00:11:6A:7F:63:EE

Licensed Codes ABCEFST6789045

Supply Voltage 13.5 V

Battery Voltage 0.1 V

FPGA Temperature 47.0 °C

HEVC Board Type B110

HEVC SW Version 1.1

HEVC Serial Number 1B7BAB8C

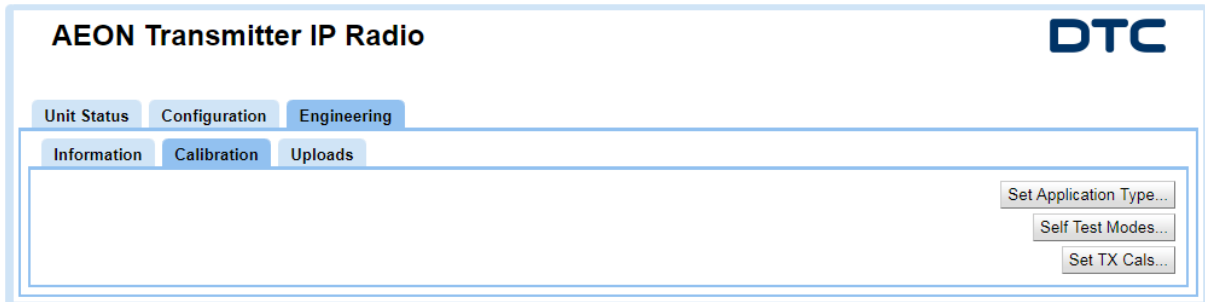
HEVC Temperature 56.0 °C 60.0 °C

Licensable Features

- [A] SOLO 2.5MHz Modulation
- [B] SOLO 1.25MHz Modulation
- [C] SOLO 625kHz Modulation
- [E] UML Modulation
- [F] DVB-T Modulation
- [H] License Exempt Band Only
- [6] 3G-SDI Route 1
- [7] 3G-SDI Route 2
- [8] 3G-SDI Route 3
- [9] 3G-SDI Route 4
- [J] SD H.264 Encoder
- [K] HD H.264 Encoder
- [M] AES128 Scrambling
- [N] AES256 Scrambling
- [R] Recording
- [S] Streaming
- [T] Telemetry
- [0] Multi-Mesh
- [1] DES Mesh Scrambling
- [2] AES128 Mesh Scrambling
- [3] AES256 Mesh Scrambling
- [4] SIMO Mesh
- [5] MIMO Mesh
- [U] SOLO 2.5MHz Demodulation
- [V] SOLO 1.25MHz Demodulation
- [W] SOLO 625kHz Demodulation
- [X] UML Demodulation
- [Y] DVB-T Demodulation

5.14 Engineering>Calibration Tab

These buttons can be used to set the calibration values of the AEON Transmitter. They are password controlled and are used at DTC to configure the AEON Transmitter for optimum RF performance prior to shipment.



5.15 Engineering>Uploads

The Uploads tab enables you to send software upgrade files or upload a license file to enable new features.



When upgrading software, a **Please Wait - Unit Upgrading** message will be displayed for a while before the browser times out.

CAUTION: It is essential that the AEON Transmitter is **not** powered down at this stage, the upgrade will be complete when the unit reboots.

Note: The upgrade involves uploading the code to the on-board SD card which then writes the code to the flash. During the writing cycle, the unit will lose web browser control for several minutes depending on how many parts of the code need to be upgraded.

A useful way to observe this cycle is to open a command prompt (enter **cmd** in the Windows Start Menu search box) and enter a permanent ping command, the syntax for this is:

```
ping -t <AEON-TX_ip_address>    e.g. ping -t 192.168.2.133
```

The pings will reply for a while then time out (the write cycle). When the pings reply again, the AEON Transmitter will have rebooted and the upgrade is complete.

When the upgrade is complete, the web browser can be recovered. Refresh the web browser to view the new software version in the **Information** tab.

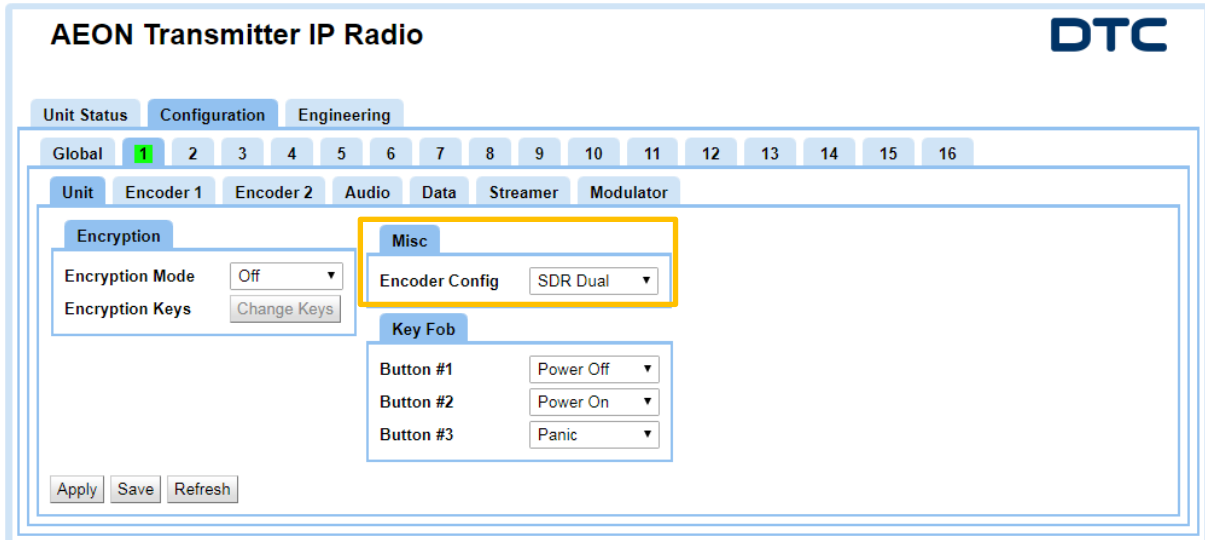
6. AEON Transmitter – SDR Dual Encoder

6.1 Introduction

SDR Dual is a configuration which will set the AEON Transmitter as a dual H.264 encoder compatible with existing DTC H.264 receiver products.

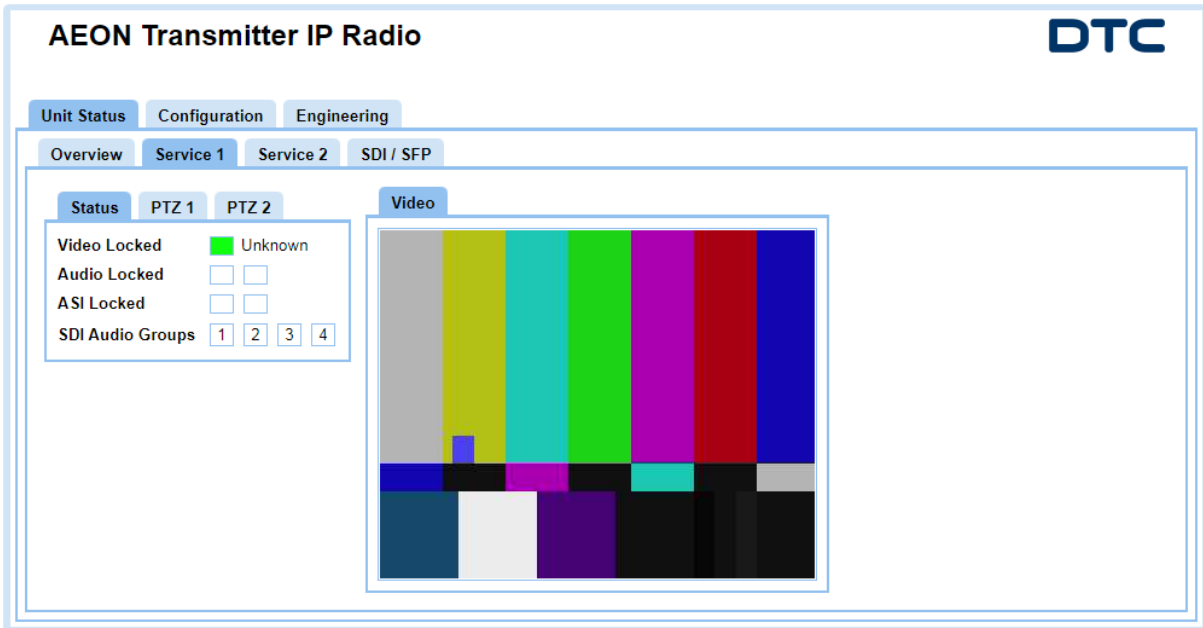
When SDR Dual is selected as the Encoder Config in the **Configuration>Preset>Unit** tab, some of the views and selections will change accordingly.

This section will show only the tabs which have changed as a result of this configuration.



6.2 Unit Status>Service>Status Tab

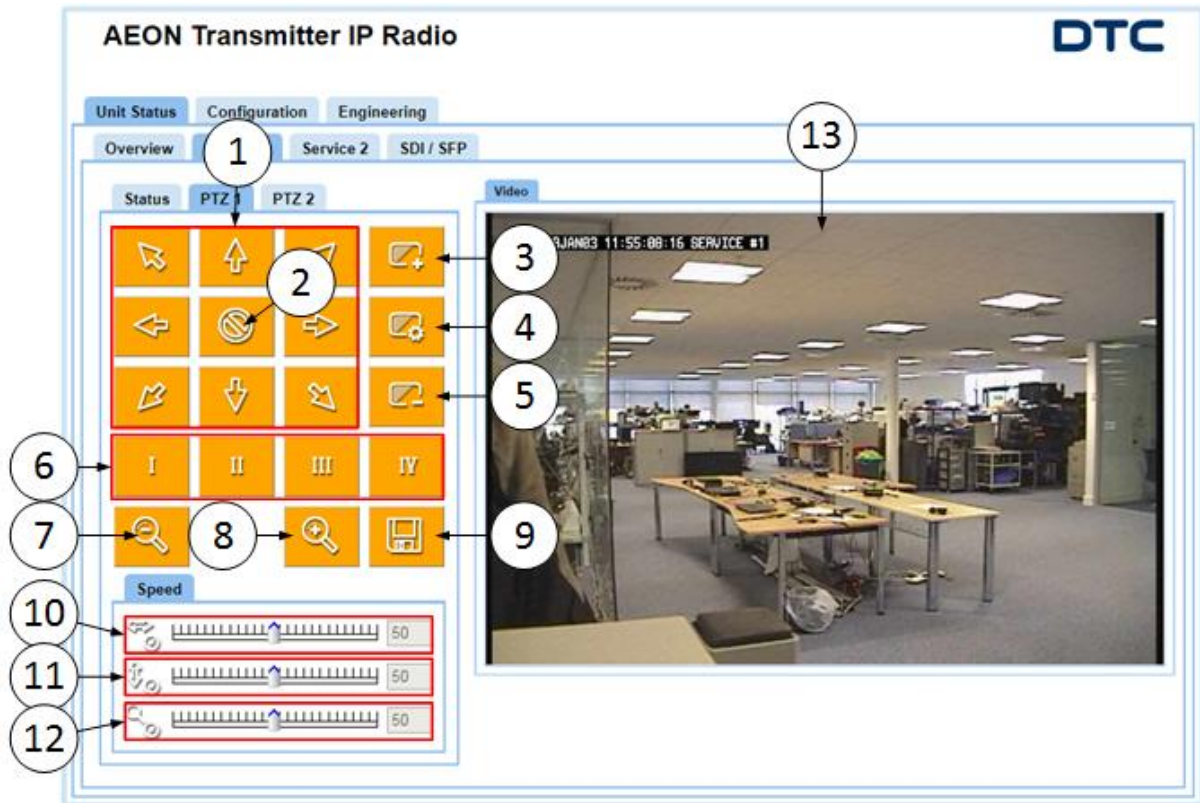
The Status tab displays video and audio status information. The **Service 1** and **Service 2** tabs display the status of the respective Services.



Property	Description
Status	Colour coded video and audio status. White – not configured; Red – not locked to source; Green – locked to source
Video	This is an MJPEG display of the video for the Service .

6.3 Unit Status>Service>PTZ Tab

The PTZ tab, allows you to control the pan-tilt-zoom and focus functions of an attached camera. Settings can be saved to presets.



No	Property	Description
1	Pan/Tilt	Click to move the PTZ camera in the direction of the arrow.
2	Force Stop	Click to stop the PTZ movement immediately.
3	Focus Far	Click to move focus to objects far away.
4	Focus Stop	Click to stop focus movement.
5	Focus Near	Click to move focus to objects nearby.
6	Presets	Up to four PTZ configurations can be saved as presets in conjunction with the Save button. Click Save icon first, then select the Preset .
7	Zoom Out	Click to zoom out.
8	Zoom In	Click to zoom in.
9	Save	To be used in conjunction with the Preset button. Click the Save button, it will turn from orange to green, this indicates that the PTZ configurations can now be saved to a preset. When you select the Preset , the Save icon will return to orange.

No	Property	Description
10	Pan Speed	Drag and drop the slider or click on the scale to set the rate of left/right movement.
11	Tilt Speed	Drag and drop the slider or click on the scale to set the rate of up/down movement.
12	Zoom Speed	Drag and drop the slider or click on the scale to set the rate of zoom in/out movement.
13	Video	An MJPEG video display for camera PTZ feedback.

6.4 Configuration > Preset > Encoder Tab

There are up to sixteen different preset configurations that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.

The screenshot displays the 'AEON Transmitter IP Radio' configuration interface. At the top right is the 'DTC' logo. Below the title bar are navigation tabs: 'Unit Status', 'Configuration', and 'Engineering'. Under 'Configuration', there are 16 preset buttons numbered 1 through 16; button 1 is highlighted with a green background. Below the preset buttons are sub-tabs: 'Unit', 'Encoder 1', 'Encoder 2', 'Audio', 'Data', 'Streamer', and 'Modulator'. The 'Encoder 1' tab is active, showing several configuration sections:

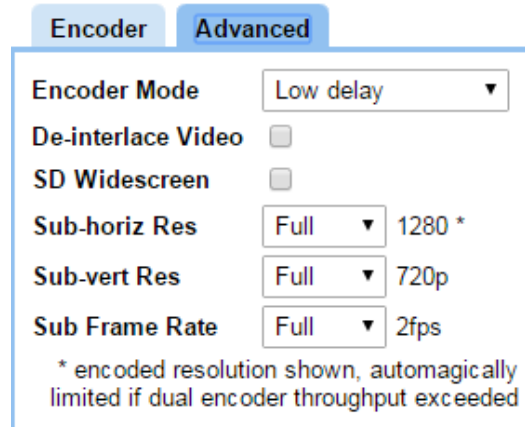
- Encoder:** Video Source (SDI (ASI OUT)), Video Format (Automatic), OSD Position (Off), OSD Type (Date Time), Bitrate Ratio (100%), Advanced Mode (unchecked), Frame Rate (slider), Resolution (ULoD 720x576i 25fps).
- Motion Triggers:** Event Mode (Vectors), Event Action (None), Event Duration (0 seconds), Event Threshold (slider for size of motion vector).
- Motion JPEG:** Sub Sampling (1/2), Picture Quality (45%), Frame Period (100 ms), Event Overlay (checked).
- Test Pattern:** Generator Control (Force on), Pattern Mode (Moving pattern).

At the bottom of the configuration area are 'Apply', 'Save', and 'Refresh' buttons. An 'Event Mask' section with a grid and 'Set All'/'Clear All' buttons is also visible.

Encoder Pane

Property	Value	Description
Video Source	Off SDI (ASI IN) MJPEG 1 (USB)	Select the video input source. The physical port on the AEON Transmitter is indicated in brackets. Note: SDI input will only work when ASI IN is not being used for Remux. See <i>Section 0</i> .
Video Format	Automatic 576i50 (PAL), 480i59 (NTSC) 720p50, 720p59, 720p60 1080i50, 1080i59, 1080i60 1080p23, 1080p24, 1080p25, 1080p29, 1080p30 1080psf23, 1080psf24, 1080psf25, 1080psf29, 1080psf30	Select the Video Format that aligns with the camera you are operating. The Automatic setting lets the AEON Transmitter establish the signal automatically. Power-up standard in Automatic mode defaults to PAL. This can be changed by setting the input to NTSC for example and then back to Automatic. If video lock is lost for any reason, Automatic will need to be re-applied.
OSD Position	Off Top Left Top Centre Top Right Centred Bottom Left Bottom Centre Bottom Right	Sets the position of the On Screen Display (OSD) which will appear on your screen when you play video.
OSD Type	Date Time Service Name Date Time Name	Will let you select what details appear on the OSD.
Bitrate Ratio	0 to 100%	Allocates more bitrate to one channel than the other. For example you can have a high resolution image on the high bit rate channel and a low resolution wide shot on the low bit rate channel.
Advanced Mode	Set or clear	When this is clear, use the slider to auto set video encoder settings. When this is ticked, see below for Advanced settings.
Frame Rate/Resolution Slider	Auto set	The video settings will be automatically selected for optimum performance by using this slider.

Advanced Encoder Settings



Property	Value	Description
Encoder Mode	Standard Low Delay Ultra Low Delay	Select the quantity of delay you can accept. Standard delay provides higher picture quality at the expense of delay. Ultra Low Delay provides very low delay at the expense of picture quality.
De-Interlace Video	Checkbox – set or clear	If selected, this converts interlaced fields to a progressive frame. This improves picture quality on PC monitor type devices. Having a progressive type of image is also easier to encode so you save bit rate too. Use it when you wish to show video on a computer monitor and save bit rate. Don't use it when you wish to keep vertical resolution or interlaced field rate.
SD Wide Screen	Checkbox – set or clear	If selected, this will change the display aspect ratio to wide screen.
Sub-horiz Res	Full 3/4 2/3 1/2 1/4	This is the fraction of the horizontal resolution for whatever format you have selected. Let's say you chose an HD 1080 format. This is actually 1920 x 1080 where 1920 is the horizontal resolution. If you select Full then you'll see all 1920 pixels, if you select 1/2 you'll see a down-sampled picture which requires much less bit-rate to encode.

Property	Value	Description
Sub-vert Res	Full 1/2 1/4	<p>This is the fraction of the vertical resolution for whatever format you have selected.</p> <p>Let's say you chose an HD 1080 format. This is actually 1920 x 1080 where 1080 is the vertical resolution.</p> <p>If you select Full then you'll see all 1080 lines, if you select 1/2 you'll see a down-sampled picture which requires much less bit-rate to encode.</p> <p>Note: Depending on the type of video content, when using a sub-vertical resolution you may wish to enable the de-interlace option too.</p>
Sub Frame Rate	Full 1/2 1/4 1/8 1/24	<p>If full frame rate is giving unsatisfactory quality, you can step this down until you get a satisfactory picture.</p> <p>Note: Using a sub-frame rate will set the Encoder Mode to Standard Delay.</p>

Motion JPEG Pane

Property	Value	Description
Sub Sampling	Full 1/2 1/4 1/8	<p>If full frame rate is giving unsatisfactory quality, you can step this down until you get a satisfactory picture.</p> <p>Note: Using a sub sampling rate will set the Encoding Mode to Standard.</p>
Picture Quality	0 to 100%	<p>You can set a value to increase or reduce picture quality.</p> <p>When you increase picture quality and the bitrate available is limited, the Frame Rate could be reduced to keep the stream running.</p>
Frame Period	100ms	The frame refresh period for the streaming video used for monitoring in milliseconds.
Event Overlay	Checkbox – set or clear	If set, this produces a momentary pink overlay on the MJPEG display when an event occurs.

Test Pattern Pane

Property	Value	Description
Generator Control	Disabled Force On Auto Video/Audio Auto Video Auto Audio AV Sync	<p>The video output will default to this when there is no video input.</p> <p>If Force on is selected, this will override the video input and will make the test pattern the video output.</p>

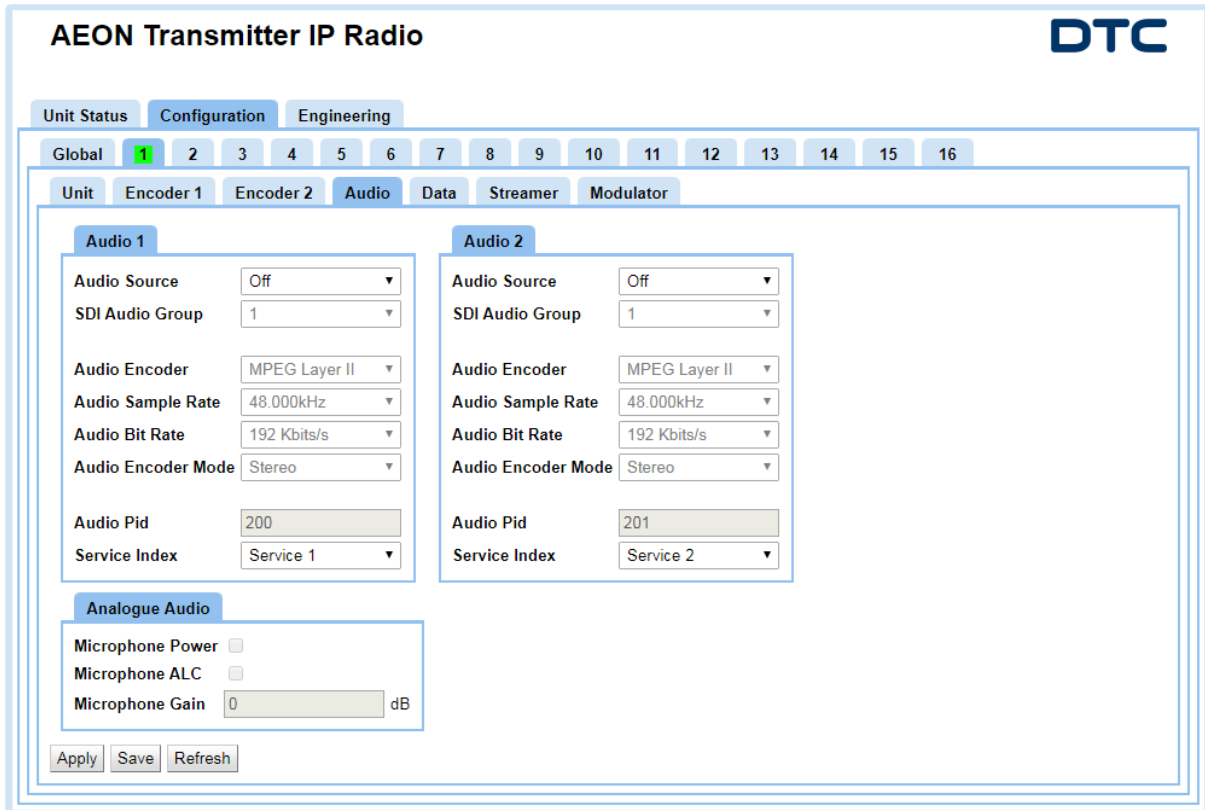
Property	Value	Description
Pattern Mode	Black screen Blue screen Green screen Cyan screen Red screen Magenta screen Yellow screen White screen Static pattern Moving pattern	This is what will appear on the screen in the event of no video input or if Generator Control is set to Force On.

Motion Triggers

Property	Value	Description
Event Mode	Off Brightness Vectors Vectors-Median Hybrid	This sets the mode which will cause a trigger to occur. Vectors-Median has improved noise filtering and Hybrid is a combination of both motion vectors and brightness. When you select an Event Mode, The Event Mask will become active.
Event Action	None Record	This will set the action to be taken when the trigger occurs.
Event Duration	Up to 59999 seconds	The length in seconds that the Event Action will occur when an Event is triggered.
Event Threshold	Slider	Drag the slider to set. This will control the sensitivity of the encoder to an event. Extreme left is the least sensitive to the trigger event.
Event Mask	Video Overlay	This becomes active when you select an Event Mode . Use the slider tool to increase or decrease the pixel size. When you click on a pixel it becomes red. This will deselect this part of the video from a trigger event. Use the Set All or Clear All buttons to select or deselect all the pixels.

6.5 Configuration > Preset > Audio Tab

There are up to sixteen different preset Configurations that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.



Audio Pane

Property	Value	Description
Audio Source	Off Analogue Embedded 1 Embedded 2	When Analogue is selected, the audio input cable can be used for mono left, mono right or stereo pair. When Embedded is selected, the audio is embedded in the SDI video signal.
SDI Audio Group	1, 2, 3, 4	SDI provides 16 channels of embedded audio in eight pairs. This should be left at default unless an advanced user.
Audio Encoder	MPEG Layer I MPEG Layer II MPEG Layer III (mp3)	You can select one of three modes to suit operating and bandwidth requirements. The higher the audio quality used the less the video bandwidth available.
Audio Sample Rate	16.000kHz 22.050kHz 24.000kHz 32.000kHz 44.100kHz 48.000kHz	This is the MPEG audio encoding sample rate. Usually the higher the number the better the audio quality.

Property	Value	Description
Audio Bit Rate	Available rates depend on current audio encoder. MPEG Layer I: 32-448kbits/s MPEG Layer II: 32-384kbits/s MPEG Layer III: 32-320kbits/s	This is the MPEG audio encoding bit rate. Usually the higher the number the better the quality.
Audio Encoder Mode	Stereo Left Mono Right Mono Dual Mono	Select the audio mode you wish to use. Dual Mono allows for different gain values on the left and right channel. Stereo uses only one.
Audio Pid	32 to 8190	This sets the PID for the audio content in the Program. The Audio PID is listed in the PMT (<i>Section 0</i>). These can be edited but should be left to default unless an advanced user.
Service Index	Service 1 Service 2	This links the audio channel to the Streamer service.

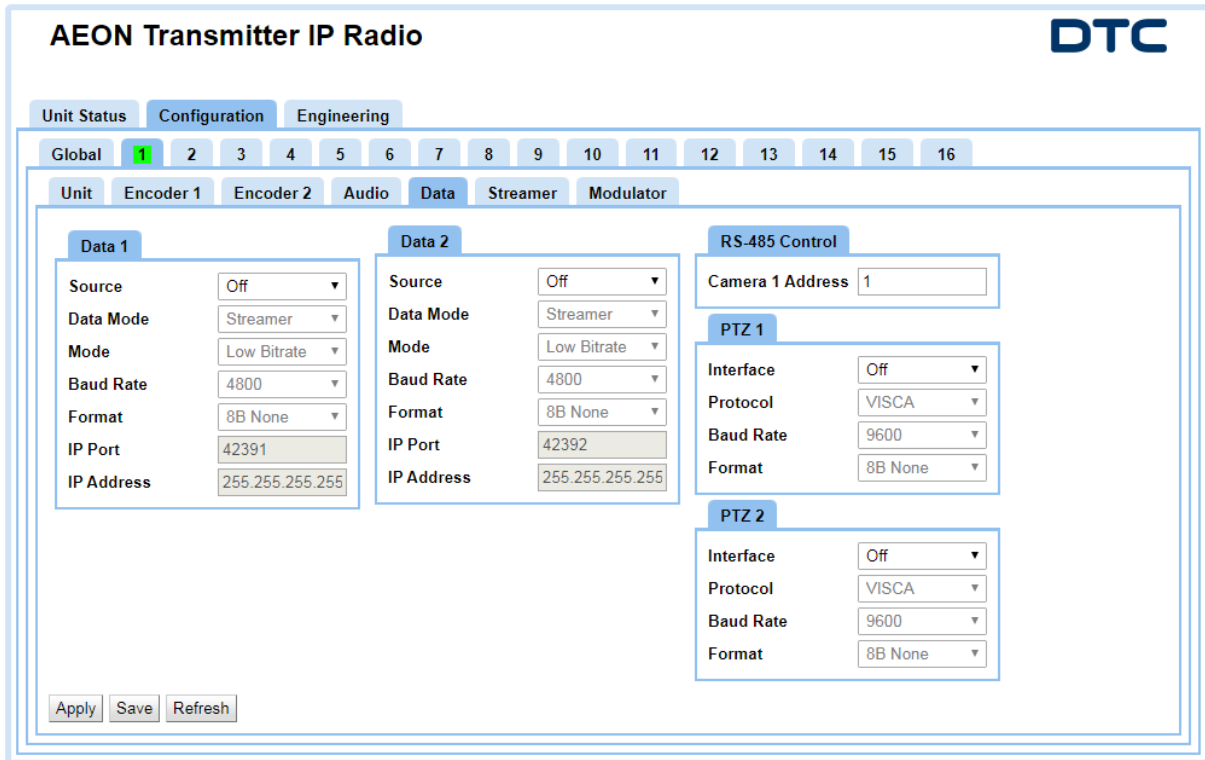
Analog Audio Pane

If the **Audio Source** is set to **Analogue**, these settings will apply.

Property	Value	Description
Microphone Power	Checkbox - set or clear	If set, this will enable power to the microphone input at approximately 3V (applicable for Electret microphones).
Microphone ALC	Checkbox - set or clear	Automatic Level Control controls power to the speaker, preventing overload. If set, this will enable the microphone ALC on.
Microphone Gain	0 to 60	Used to set the audio gain applied to the audio input signal. 0dB is no gain which is the default setting. If you have low level audio sources you can wish to apply more gain.

6.6 Configuration > Preset > Data Tab

There are up to sixteen different preset configurations that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.



Data Pane

A remote data link may be setup and data packets added to the Service.

There are two sets of data parameters, Data 1 and Data 2. These are the data packets for Streamer Service 1 and 2.

Property	Value	Description
Source	Off RS-485	This selects the serial interface for the transfer of data between AEON Transmitter and a remote unit.
Data Mode	Streamer UDP TCP Server TCP Client	<p>Streamer – When in Streamer mode, serial data will embedded in the IP stream.</p> <p>UDP - User Datagram Protocol is used to move data about the network. The packets are sent out and the system does not expect a reply. There is no way that the sending device can tell if the data arrived at the destination.</p> <p>TCP - Transmission Control Protocol is used to move data about the network. The packets are sent out and the system will expect a reply. Each message is acknowledged by the destination device.</p> <p>TCP Server/Client allows applications such as telnet to connect to the port.</p> <p>Setting one AEON Transmitter to TCP Server and one to TCP Client allows data pipes to be formed.</p>

Property	Value	Description
Mode	Low bitrate Low latency	Select Low latency to minimise delay at the expense of bitrate.
Baud rate	1200 to 115200	The baud rate of the output.
Format	8B None, 8B Even, 8B Odd, 7B None, 7B Even, 7B Odd	The data and parity bit.
IP Port	42391	These set an IP Port to and from which the data will be transferred. The user can connect to the data port through Telnet by setting the mode to TCP and the port number to 23. The user can connect two data ports on different units by setting UDP mode and using the aligning port numbers.
IP Address	255.255.255.255	The IP address of the destination computer which wishes to connect or all 255's for any host. These set an IP address to and from which the data will be transferred.

RS-485 Control Pane

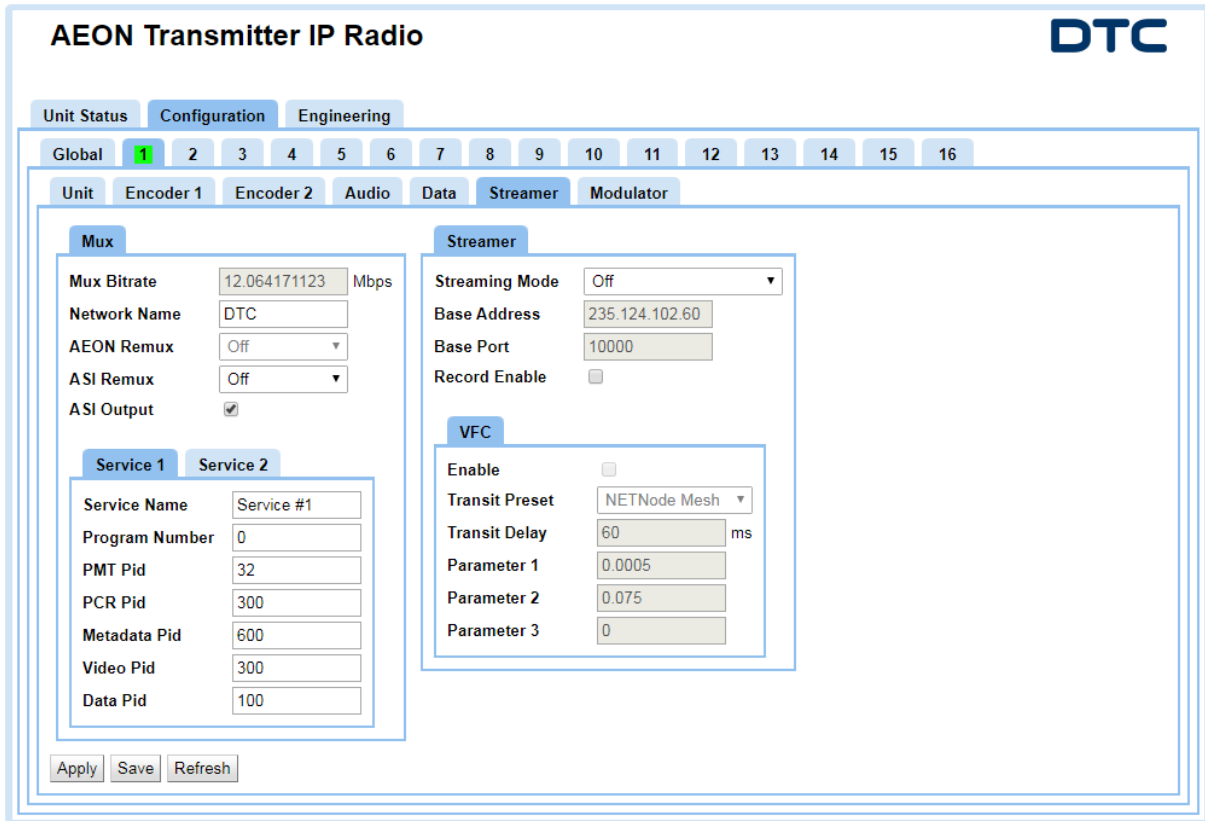
Property	Value	Description
Camera 1 Address	0 to 255	The attached camera must be given a unique address which the AEON Transmitter must match.

PTZ Pane

Property	Value	Description
Interface	Off RS-485	The serial interface for the transfer of data between your camera and the AEON Transmitter unit. This will change where the PTZ commands go to on the Camera Control connector.
Protocol	VISCA, Pelco-D	Control protocols for PTZ devices.
Baud rate	1200 to 115200	The baud rate of the output.
Data format	8B None, 8B Even, 8B Odd, 7B None, 7B Even, 7B Odd	The data and parity bit.

6.7 Configuration > Preset > Streamer Tab

There are up to sixteen different preset configurations that can be setup. In this example we are viewing preset 1 which is highlighted with a green background to denote that it is active.



Mux Pane

Property	Value	Description
Mux Bitrate	Up to 50Mbps/s	The multiplexer bitrate for the service. If the Modulation is set to off, this can be set manually.
Network Name	Up to 40 alphanumeric characters	A name to identify the Mux. It will appear as the Publisher in VLC.
AEON Remux	Off	This cannot be set when in SDR Dual encoder mode.
ASI Remux	Off On Relay	Off – No ASI. On – Enables the re-multiplexing of an ASI input. Relay – disables local services and only passes ASI. See Notes at the bottom of the Table.
ASI Output	Set or clear	When set, the ASI output will contain the same content sent over the modulator.

Property	Value	Description
Service Name	Service #1 or characters you choose	This is an identifier for the service in the Transport Stream (TS). The TS can have many services. The receiver must align with this name for the service to be decoded.
Program Number	1, 2, etc.	A number to identify the Program. Transport Streams have Programs, each Program is described by a PMT .
PMT Pid	32 to 8190	Each table or elementary stream in a transport stream is identified by packet ID (PID). The Program Map Table (PMT) contains information about the Program. For each Program, there is one PMT. These can be edited but should be left to default unless an advanced user.
PCR Pid	32 to 8190	Each table or elementary stream in a transport stream is identified by packet ID (PID). The Program Clock Reference (PCR) is used to sync the audio and video. The PCR PID is listed in the PMT. These can be edited but should be left to default unless an advanced user.
Metadata Pid	32 to 8190	Each table or elementary stream in a transport stream is identified by packet ID (PID). This sets the PID for the metadata associated with the Program. The Metadata PID is listed in the PMT. These can be edited but should be left to default unless an advanced user.
Video Pid	32 to 8190	Each table or elementary stream in a transport stream is identified by packet ID (PID). This sets the PID for the video content in the Program. The Video PID is listed in the PMT. These can be edited but should be left to default unless an advanced user.
Data Pid	32 to 8190	The packet identifier for the data. The Data PID is listed in the PMT. These can be edited but should be left to default unless an advanced user.

Note 1: The mux bitrate must be equal to or greater than the total bit rate of services and inputs. If the total bit rate exceeds the mux bitrate the output stream won't work.

Note 2: If you set ASI Remux to Relay it disables the video source for that channel. You must switch ASI Remux Off when you want to reselect a video source.

Streamer Pane

Property	Value	Description
Streaming Mode	Off UDP RTSP Unicast RTSP Multicast RTP RTP-Z	Select the streaming mode you wish to operate with. Streams can be played back using VLC or Domo Video Player (requires a license).
		Note: RTP-Z is DTC's compressed RTP. You will need Domo Video Player to run streams using this protocol. If you select RTP-Z, VFC Options will become available.
Base Address	For example: 237.103.227.228	This enables you to change the address used by the unit for streaming. The default value is random to make sure different AEON Transmitter have different multicast addresses.
Base Port	10000 or above	UDP uses port numbers in the header to direct traffic around the network. A good rule is to use numbers above 10000 to avoid conflict with existing services. When you set up a port number on several computers on a network they will all listen for packets directed to that port.
Record Enable	Set or clear	When you select this box, the video will be recorded to the built in SD card.
VFC Enable	Set or clear	If set, this enables Video Flow Control (VFC) when streaming in RTP-Z . VFC allows the video bitrate to be varied depending on the bandwidth available. This prevents corruption of the video when bandwidth drops and allows the picture quality to adapt accordingly.
		Note: VFC is a PID Controller. VFC Parameters 1, 2 and 3 correspond with the Proportional, Integral and Derivative terms of the control loop.
VFC Transit Preset	Custom NETNode Mesh	If you choose Custom, you can manually select values for Transit Delay and Parameters. Choose one of the Presets to autofill the remaining settings.
VFC Transit Delay	Up to 2000ms	Too low a value will drop the bitrate, too high a value will increase latency and corrupt the video. In most cases the default value will operate well. The VFC operates by monitoring the latency from the video encoder to the endpoint. The system tries to maintain the round trip of the Transit Delay.
VFC Param1	0 to 1	Can be up to six decimal places. This corresponds with the VFC Proportional term.

Property	Value	Description
VFC Param2	0 to 1	Can be up to six decimal places. This corresponds with the VFC Integral term.
VFC Param3	0 to 1	Can be up to six decimal places This corresponds with the VFC Derivative term.

7. AEON-MESH Web Browser Operation

7.1 Introduction

This section will **only** show the configurations which require explanation as a result of this configuration and **are not** detailed in the *NETNode Phase 5 Software Guide* or in previous sections of this document.

For full details of Mesh operation, refer to DTC document *NETNode Phase 5 Software Guide* which has instructions which are compatible with the AEON-MESH.

When MESH is selected as the Encoder Config in the **Configuration>Global** tab, some of the views and selections will change accordingly.

The screenshot displays the 'AEON Mesh IP Radio' web interface. At the top, it shows '0 - 0 - AEONTX' and the 'DTC' logo. Below this are navigation tabs for 'Unit Status', 'Configuration', and 'Engineering'. Under 'Configuration', there are sub-tabs numbered 1 through 16, with '1 Global' selected. The main content area is divided into several sections:

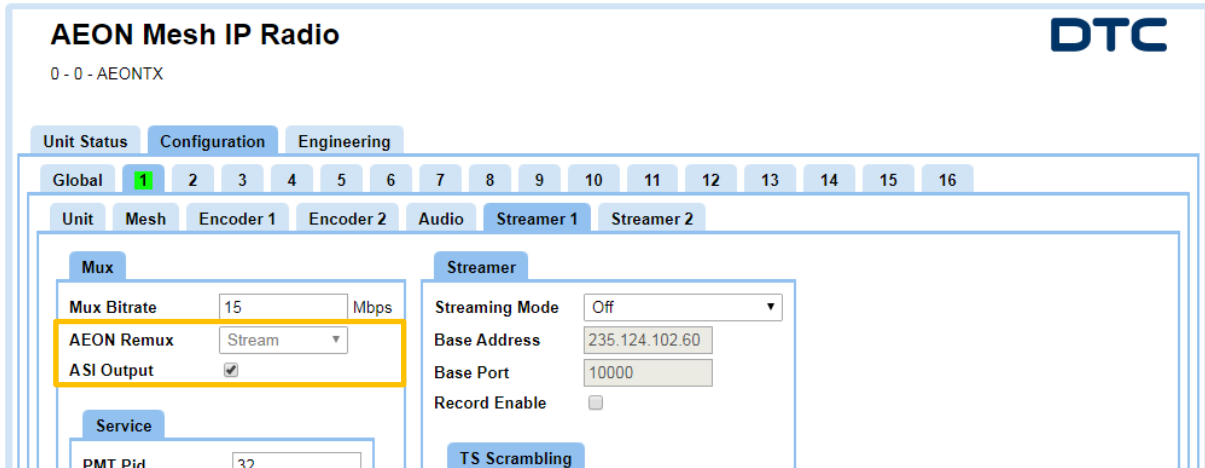
- Main:** Contains fields for 'Advanced Mode' (checkbox), 'Unit Name' (text: AEONTX), 'Application' (dropdown: MESH), 'Auxiliary Address' (text: 6), 'Country Code' (dropdown: 00), 'Speed Units' (dropdown: Knots), 'Image Password' (checkbox), 'Logging Enable' (checkbox), and 'Update All Nodes*' (checkbox).
- IP:** Contains fields for 'DHCP Enable' (checkbox), 'IP Address' (text: 192.168.0.128), 'Network Mask' (text: 255.255.255.0), 'Gateway' (text: 192.168.0.1), 'RIP v2 Enable' (checkbox), 'STP Enable' (checkbox), 'IGMPv2 Compatible Mode' (checkbox), 'Streamer VLAN Tag' (text: 0), 'Tunnel Port' (text: 37682), and 'Actual Address' (text: 192.168.2.185).
- Network Time:** Contains 'Sync Local Time' (dropdown: Off/NTP) and 'NTP Server' (text: 0.0.0.0).
- Telemetry:** Contains 'Frequency' (text: 445 MHz), 'Training Freq' (text: 433.04998779 MHz), 'Mod Mode' (dropdown: 2-GFSK, 4800 baud), and 'Packet Status' (text: Undetermined LQI: 0).

At the bottom of the interface, there are buttons for 'Apply', 'Refresh', 'Restore Defaults...', 'KeyFob Train...', 'Password...', 'System...', and 'Set Clock...'.

7.2 AEON-MESH with AEON Encoder

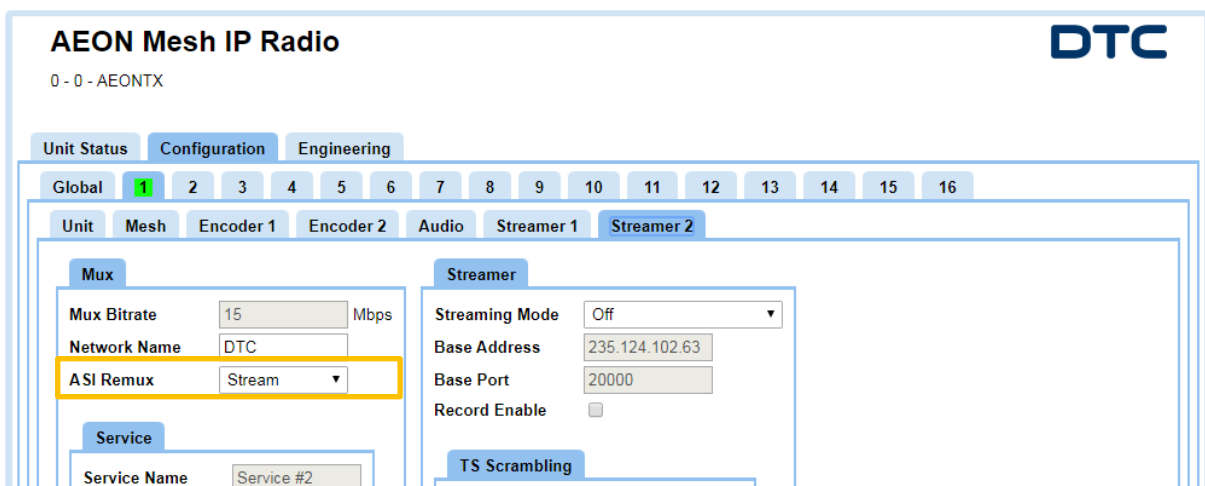
When AEON-MESH is configured as an **AEON encoder** in the **Configuration>Preset>Unit** tab, the following settings for the **Streamer 1** and **Streamer 2** tabs needs to be explained.

Streamer 1



Property	Value	Description
AEON Remux	Stream	Set to Stream by default. This means that what is being encoded by the AEON will appear on the Streamer 1 output.
ASI Output	Set or clear	When set, the ASI output will contain the same content sent over Streamer 1.

Streamer 2

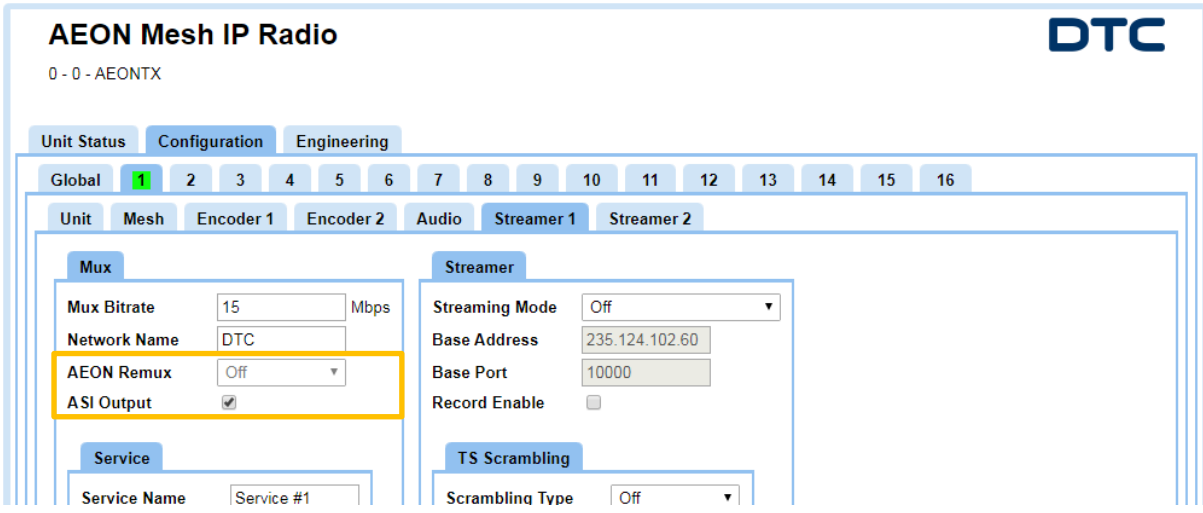


Property	Value	Description
ASI Remux	Off Stream	Set to Stream by default. This means that the remuxed ASI input will appear on the Streamer 2 output.

7.3 AEON-MESH with SDR Dual Encoder

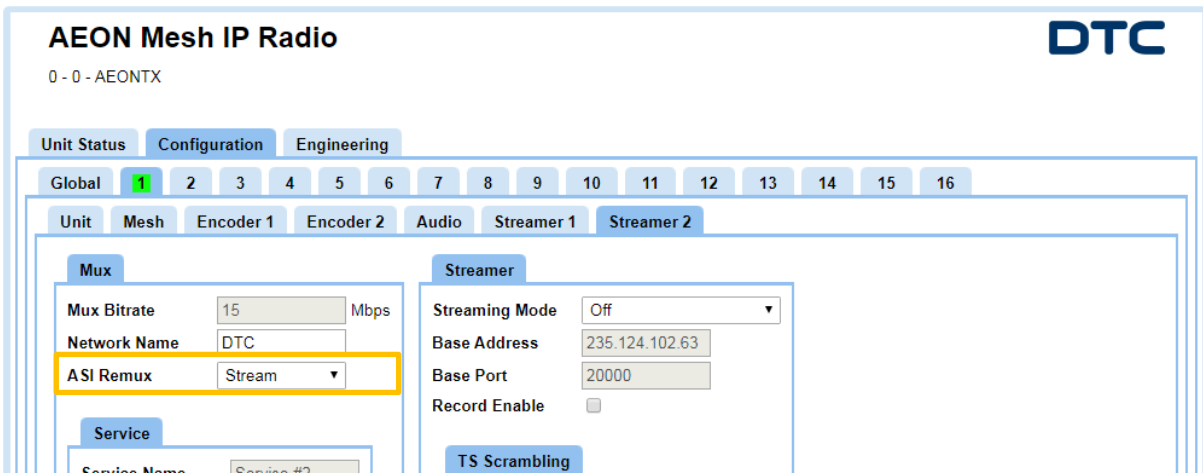
When AEON-MESH is configured as an **SDR Dual encoder** in the **Configuration>Preset>Unit** tab, the following settings for the **Streamer 1**, **Streamer 2** and Encoder tabs needs to be explained.

Streamer 1



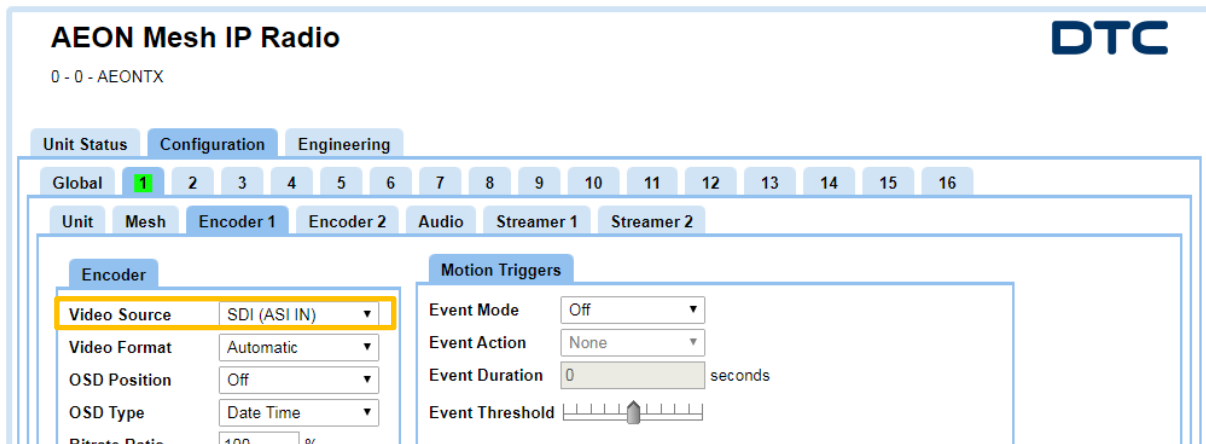
Property	Value	Description
AEON Remux	Off	Set to Off by default.
ASI Output	Set or clear	When set, the ASI output will contain the same content sent over Streamer 1.

Streamer 2



Property	Value	Description
ASI Remux	Off Stream	When set to Stream, this means that the remuxed ASI input will appear on the stream 2 output.

Encoder



Property	Value	Description
Video Source	Off SDI (ASI IN) MJPEG 1 (USB)	Select the video input source. The physical port on the AEON Transmitter is indicated in brackets. Note: SDI input will only work when ASI IN is not being used for Remux. See above.

8. AEON Transmitter LCD Display Operation

8.1 Overview

When in deployment, the AEON Transmitter may be controlled and monitored via the LCD display.

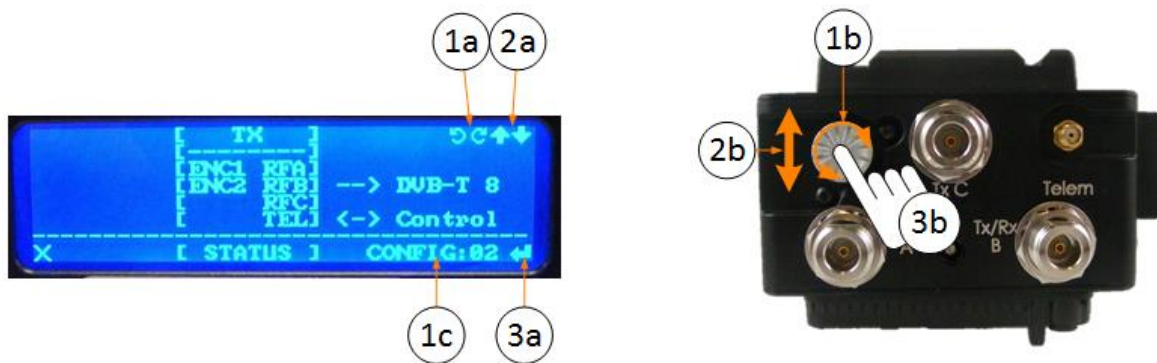
The LCD display will go into sleep mode after approximately one minute, to wake the LCD simply press or move the control button in any direction.

When the LCD wakes up, the status view will be displayed.



8.2 Icons and Controls

The LCD display is controlled by the navigation button on the top panel. The LCD display has some icons that let you know which button movements are active.

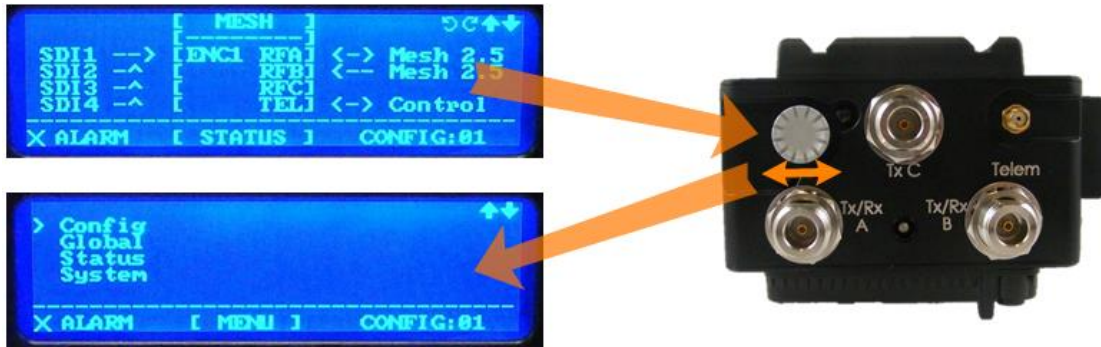


Item	Description
1a/1b	The rotation icons (1a) indicate that the button rotation (1b) is active. When in the status view, rotation will change the config selection (1c).
2a/2b	The arrow icons (2a) indicate that the button up/down movement (2b) is active. When in the status view, button up/down will change the status pages.

Item	Description
3a/3b	The enter icon (3a) indicates that the button press (3b) is active. When in the status view, press the button to enter the config selection.

8.3 Navigating the Menu

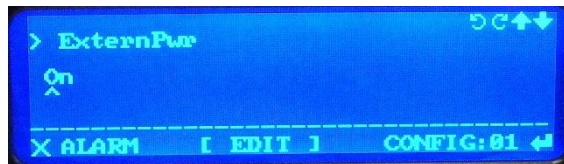
From the status page, move the navigation button **left** or **right**, to view the menu list, see below.



From this page, the menu structure can be navigated to a higher or lower level by moving the button **left** or **right**.

Note: Always pay attention to the icons that are displayed to inform you of what button actions are available.

When you navigate to a parameter that you wish to edit, you will find that button **up/down** and **rotation** will both change the selection. When the desired selection has been made, use the button **press** to save the value.



9. AEON Decoder/Encoder Operation

9.1 Introduction

AEON Decoders and Encoders are controlled from the front panel OLED display.

This section explains operation to enable the user to customise the device for specific requirements.

See *Section 3.3* for hardware connectivity.

9.2 OLED Display

Boot Up

The OLED display shows status information and allows the user to make some necessary configurations.

After initialisation on boot up, the status page will be displayed. The status page displays current settings and video input information.



The Left Button

Push the left button to enter the display menu.

From the top menu level the left button is inactive, but from lower menu levels the left button operates as an escape to the previous display.



The Right Button

The right button will navigate the menu list up and down and push to select.

When a parameter has been selected for edit, the right button can be used again to change the value by moving up/down, or left/right to change the location of the cursor when editing a string value.

Press to save the setting.



9.3 Configurable Values

The AEON Encoder/Decoder is currently able to configure these values:

Property	Value	Description
Video Format	480i59, 480p59 576i50, 576p50 720p50, 720p59, 720p60 1080i50, 1080i59, 1080i60 1080p23, 1080p24, 1080p25, 1080p29, 1080p30 1080psf23, 1080psf24, 1080psf25, 1080psf29, 1080psf30 1080p50, 1080p59, 1080p60 2160p23, 2160p24, 2160p25, 2160p29, 2160p30, 2160p50, 2160p59, 2160p60	Select the video format for the system.
Sample Format	SQD 2SI	<p>Square Division – each 3G-SDI link contains one quarter of the original image.</p> <p>2 Sample Interleave (2SI) – each 3G-SDI link contains a full image at 1/4 resolution.</p> <hr/> <p>Note: The Decoder outputs currently only support 3G-SDI Level A signals.</p>
Video PID Audio PID PCR PID PMT PID SIT PID	Variable	These values must match the PIDs being sent by the AEON transmitter.
IP Address	User defined or DHCP	Change the IP address if DHCP has been disabled.
DHCP Mode	On Off	<p>Our devices are shipped to you with the DHCP setting enabled. This means that if the AEON decoder is connected to a network which is administered by a DHCP server, an IP address will be automatically allocated to it.</p> <p>If you are unsure about your server settings, check with your Network Administrator.</p>

10. Example Applications

10.1 Single AEON 4K HEVC Encoder

Setup

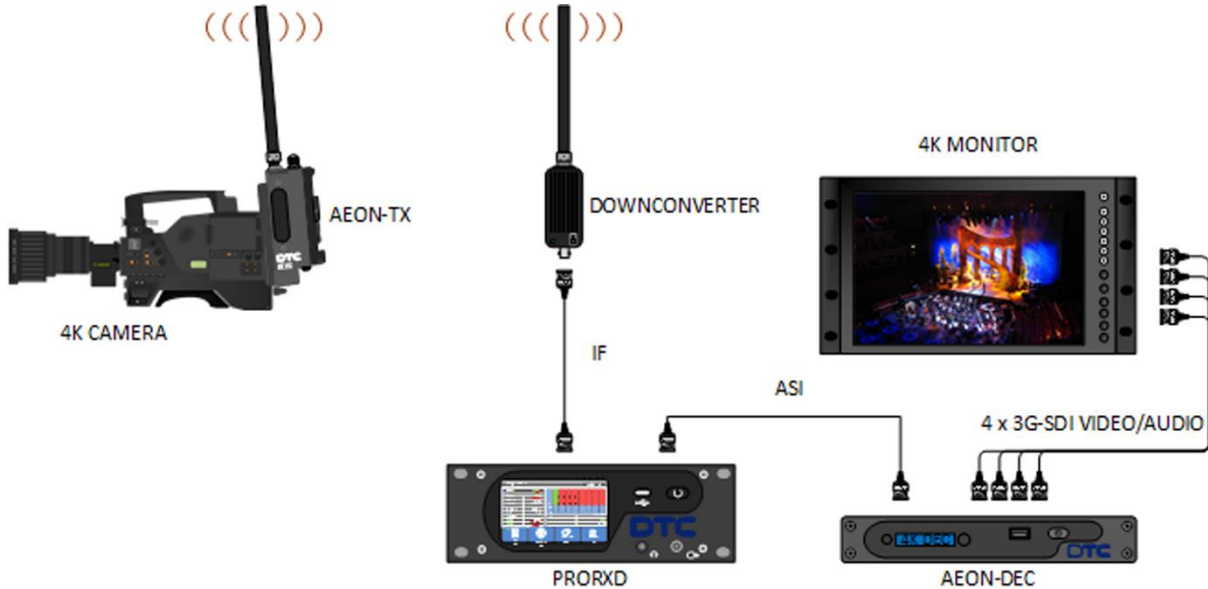


Figure 10-1 4K HEVC Video

Figure 10-1 is an example setup for an AEON Transmitter fitted to a 4K video camera. The COFDM transmission is received by a PRORXD and the ASI output is passed to the AEON Decoder. The decoded 4K video is output as 4 x 3G-SDI video to a monitor for viewing.

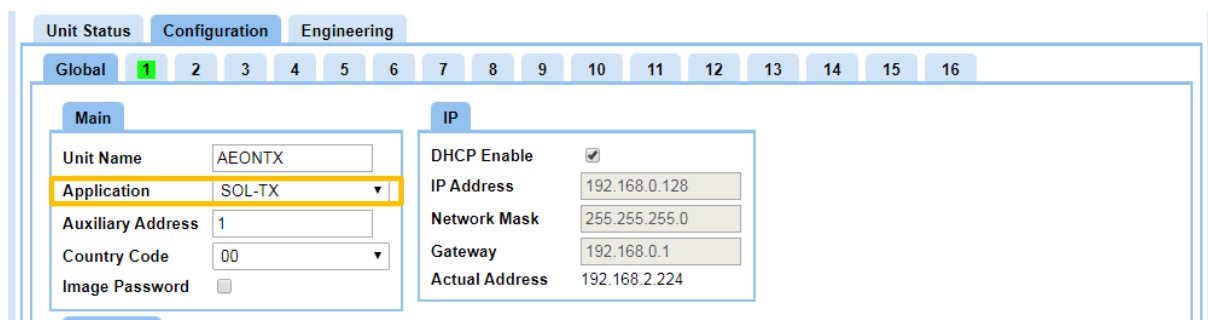
The PRORXD will need to be setup in accordance with the *PRORXD Broadcast Receiver User Guide*.

AEON-TX Configuration

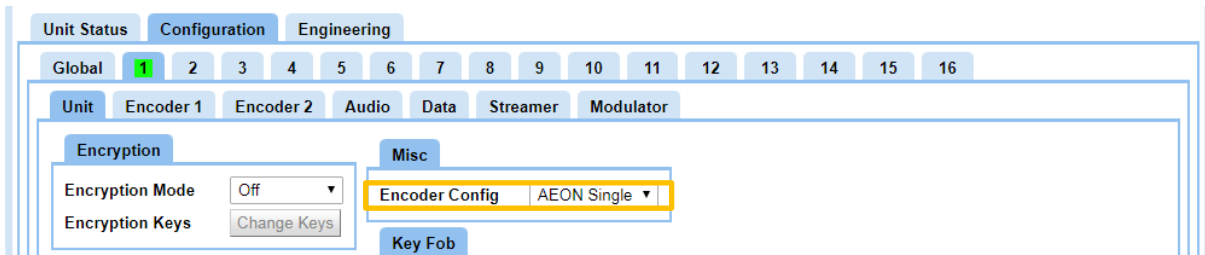
There are some basic configurations that will have to be made to ensure a successful transmission.

Note: If changes are needed, ensure that the **Apply** button is clicked to save the changes.

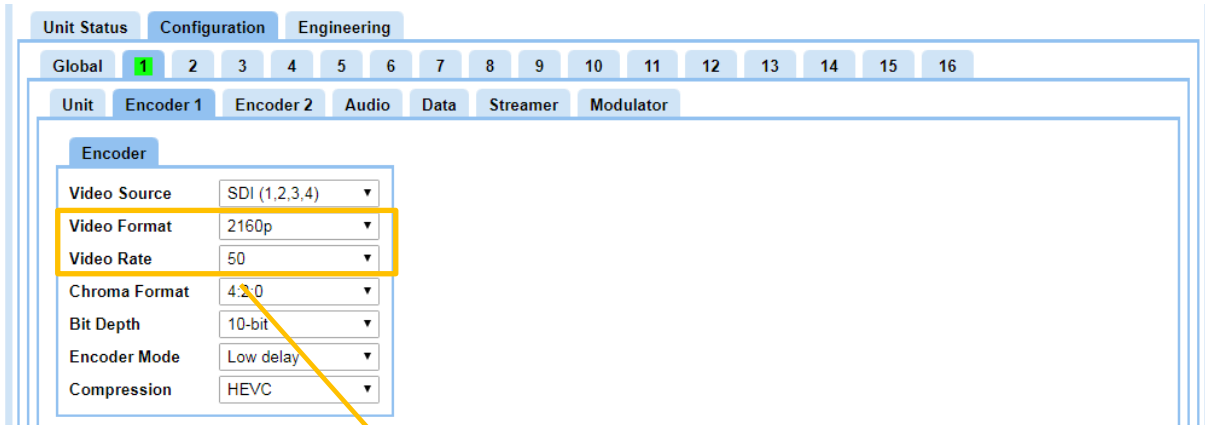
On the **Global** tab ensure that the Application is set to **SOL-TX**.



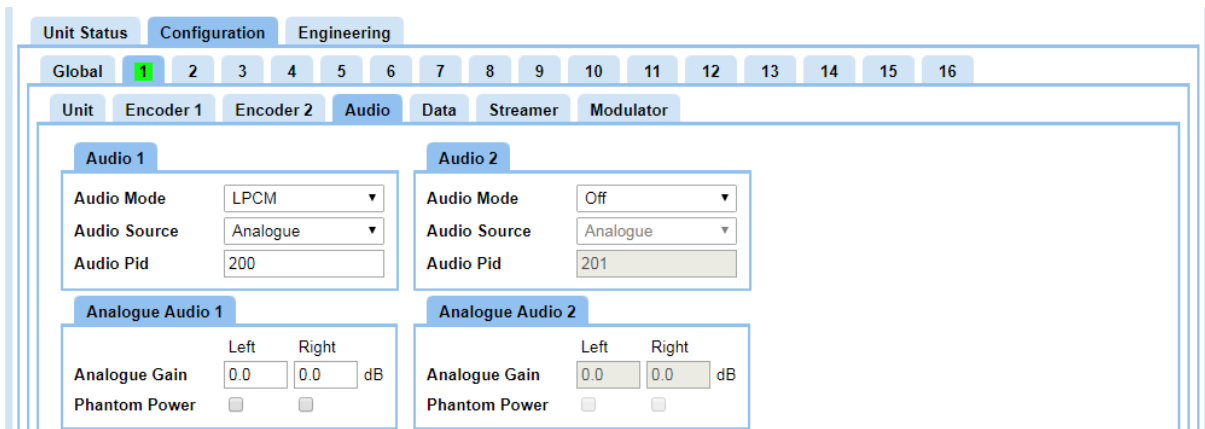
On the **Unit** tab ensure the Encoder Config is set to **AEON Single**.



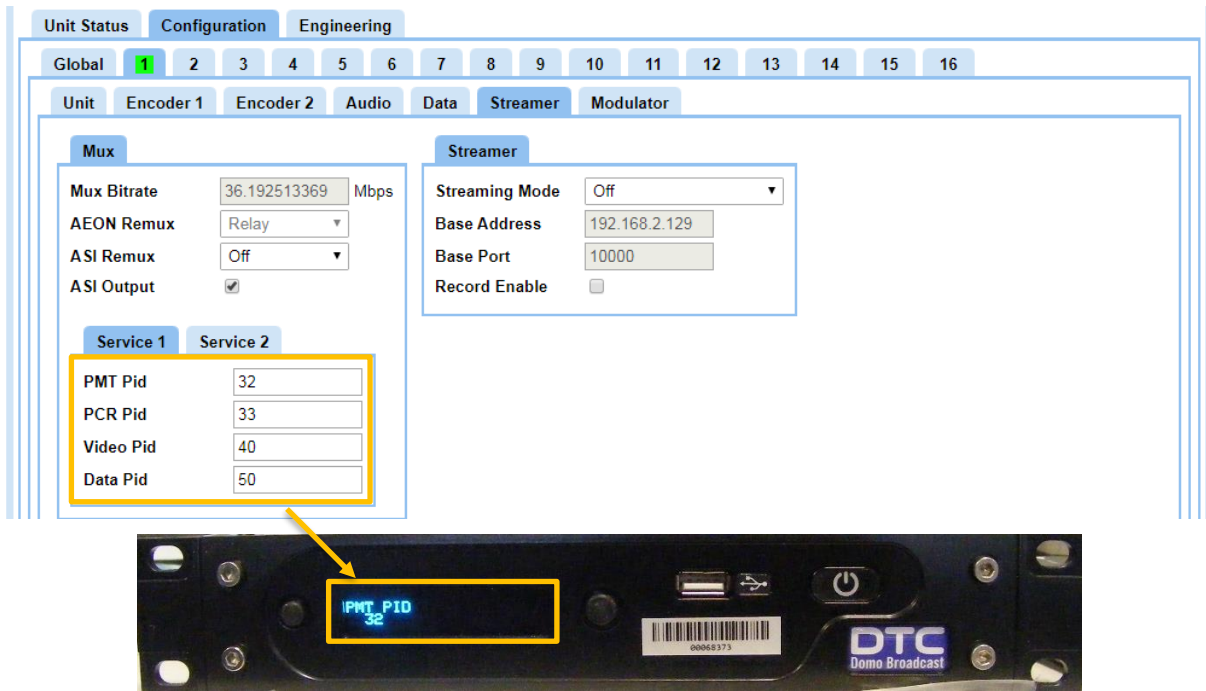
On the **Encoder** tab set the video input encoding configurations. The Video Format and Video Rate **must** be matched by the **AEON Decoder**.



On the **Audio** tab set up the audio input configurations, if applicable.

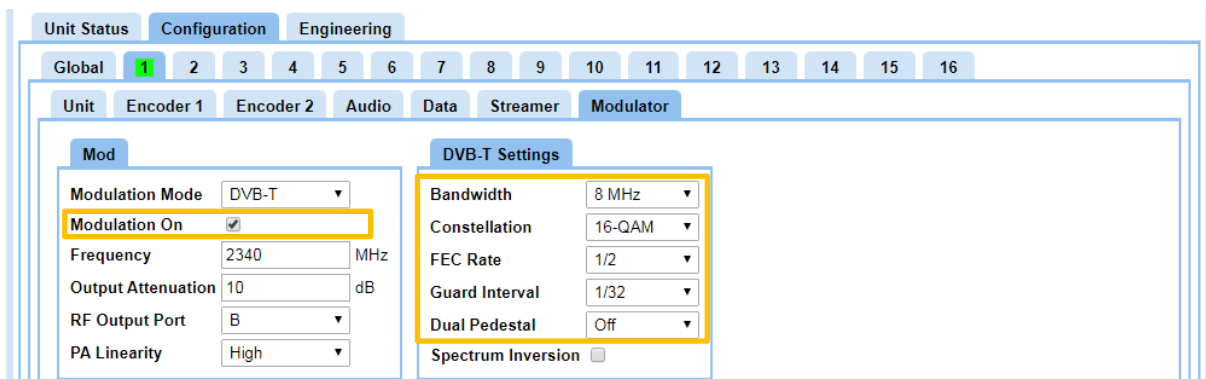


Ensure the **AEON Decoder** PIDs match the settings in the **Streamer** tab.



On the **Modulator** tab set up the modulation parameters, ensuring the correct **Modulation Mode**, **Frequency** and **Bandwidth** requirements for the system. These settings must be matched at the PRORXD receiver.

Set the **Modulation On** checkbox to turn the RF power on.



Recommended **DVB-T Settings** for optimum video:

- **HD 1080p50/59** – 16-QAM, FEC 1/2
- **HD 1080p50/59 with LPCM audio** – 16-QAM, FEC 2/3
- **Ultra HD 2160p50/59** – 16-QAM, FEC 1/2 or 2/3, Dual Pedestal enabled

The PRORXD Receiver should lock to the transmission and the demodulated ASI output passed to the AEON Decoder. The Decoder OLED display should show **ASI: Lock** and the 4 x 3G-SDI output is available at the Decoder for onward process.

10.2 MESH Application

Setup

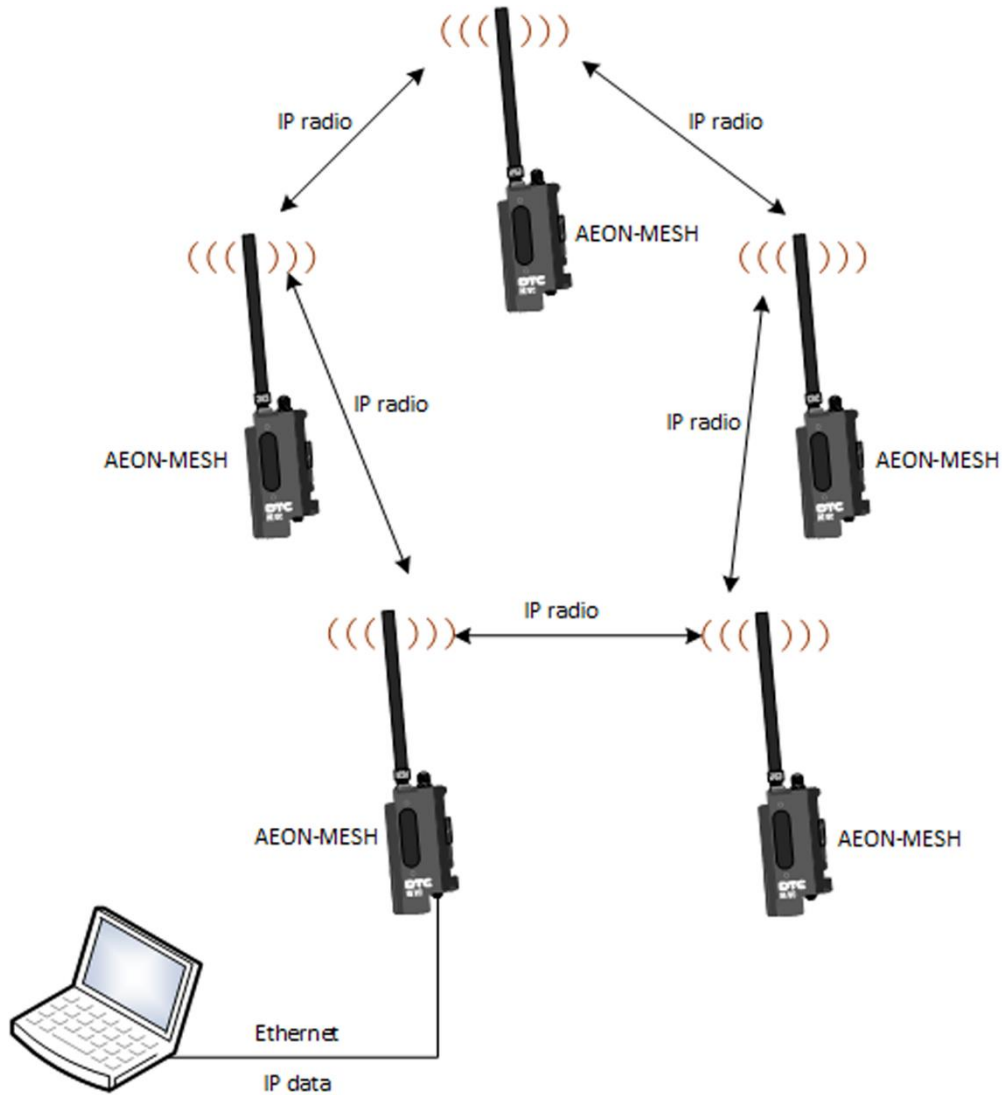


Figure 10-2 IP Mesh Radio

Figure 10-2 is an example setup of AEON Transmitters configured in an IP Mesh network. The network is a fluid, self-healing Mesh of up to 16 nodes on a single transmit frequency. The IP data can be passed onwards to a LAN or monitored on a laptop or PC.

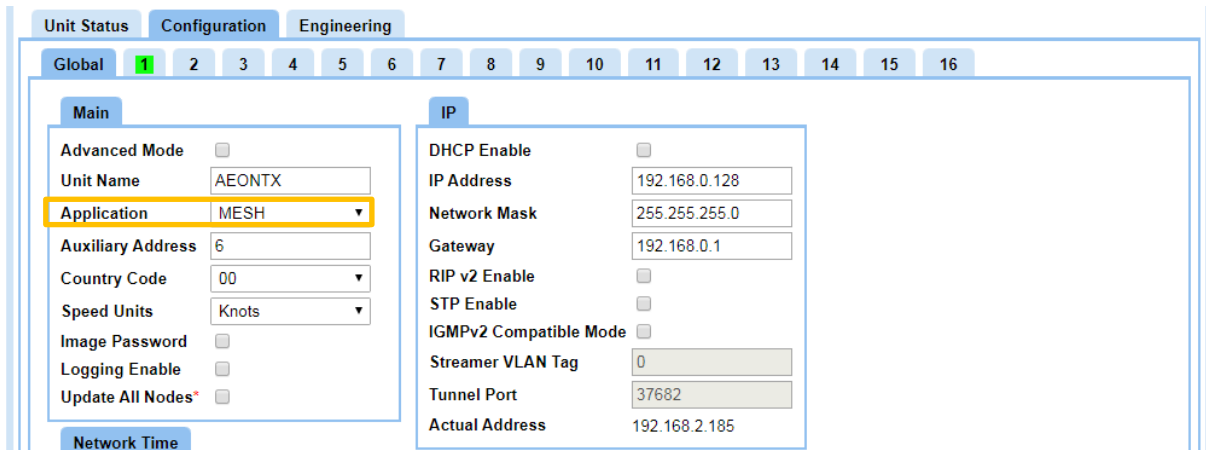
For full details of Mesh operation, refer to DTC document *NETNode Phase 5 Software Guide* which has instructions which are compatible with the AEON-MESH.

AEON-MESH Configuration

There are some basic configurations that will have to be checked and set as appropriate to ensure a successful transmission.

Note: If changes are needed, ensure that the **Apply** button is clicked to save the changes.

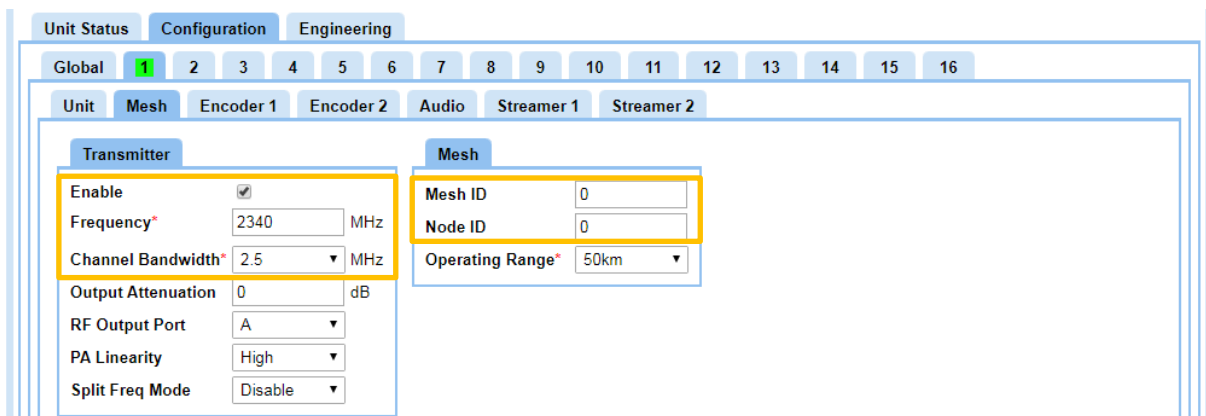
On the **Global** tab ensure that the Application is set to **MESH** and configure the **IP settings** for the network.



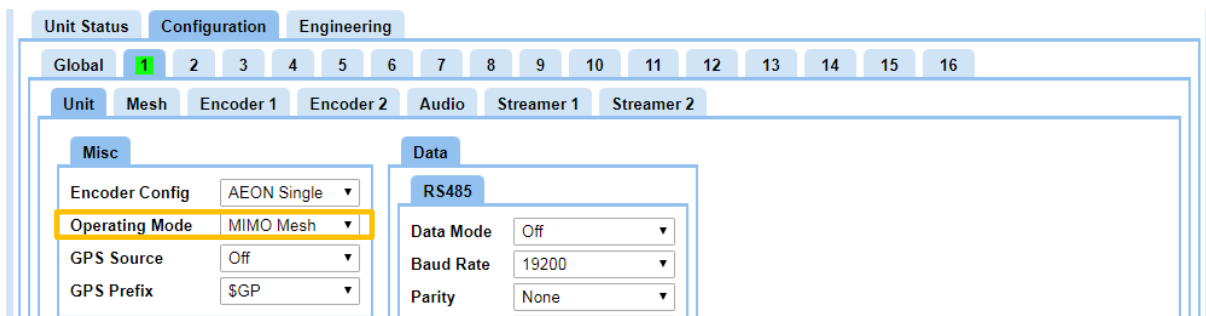
On the **Mesh** tab set up the modulation parameters, ensuring the correct **Frequency** and **Channel Bandwidth** requirements for the system.

The **Mesh ID** should match for all Nodes in a Mesh network but the **Node ID** must be unique from 0 to 16.

Set the Transmitter **Enable** checkbox to turn the RF power on.




Some consideration will need to be made to the **Unit** tab Operating Mode settings when transmitting 4K quality video as it will be necessary to put the unit into **MIMO Mesh** mode in order achieve the data requirements.



The AEON Mesh can be viewed in the **Unit Status>Mesh>Overview** page.

AEON Mesh IP Radio

41 - 2 - Hamet_2



Unit Status
Configuration
Engineering

Mesh 1
Overview
Streamer 1
Streamer 2
SDI / SFP

Overview
Spectra
Maps

Node ID	0	1	2	7	8	9	10	11	12	13	14
Unit Name	Hamet_1	Hamet_3	Hamet_2	HH_3	Loose	HH_6	HH_2	HH_1	HH_5	HH_4	SMOKEY
IP Address	192.168.2.139	192.168.2.249	192.168.2.194	192.168.2.212	192.168.2.237	192.168.2.229	192.168.2.240	192.168.2.189	192.168.2.157	192.168.2.242	192.168.2.1
Battery Voltage	12.5 V	12.5 V	12.5 V	12.0 V	13.2 V	12.8 V	12.0 V	11.9 V	12.0 V	12.0 V	12.2 V
FPGA Temp	51.0 °C	54.0 °C	50.0 °C	38.0 °C	70.0 °C	45.0 °C	39.0 °C	38.0 °C	41.0 °C	39.0 °C	46.0 °C
Occupancy											
Node TX Retries	-	-	-	-	-	-	-	-	-	-	-

Show Details

Signal Quality

	0	1	2	7	8	9	10	11	12	13	14
0											
1											
2											
7											
8											
9											
10											
11											
12											
13											
14											

	SNR	Level A	Level B	Token Retries	IP Rx Errs
Rx\Tx					
0		26.9	26.3	24.0	20.8
1	26.8		25.4	23.0	20.6
2	28.4	27.5		24.6	22.4
7	25.2	24.3	23.9		21.4
8	24.6	24.6	24.7	24.3	
9	23.1	25.1	24.8	25.0	21.2
10	24.4	23.5	23.6	22.9	22.1
11	21.6	21.7	22.8	23.3	22.3
12	25.4	20.2	24.0	15.4	22.6
13	24.9	24.6	23.9	22.4	22.0
14	25.3	24.1	23.9	25.5	22.8

100249
Revision: 1.0

Commercial in Confidence

Page 10-67

11. Appendix A – Reference Material

11.1 How to Configure a PC IP Address

The following guide will tell you how to configure your 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.

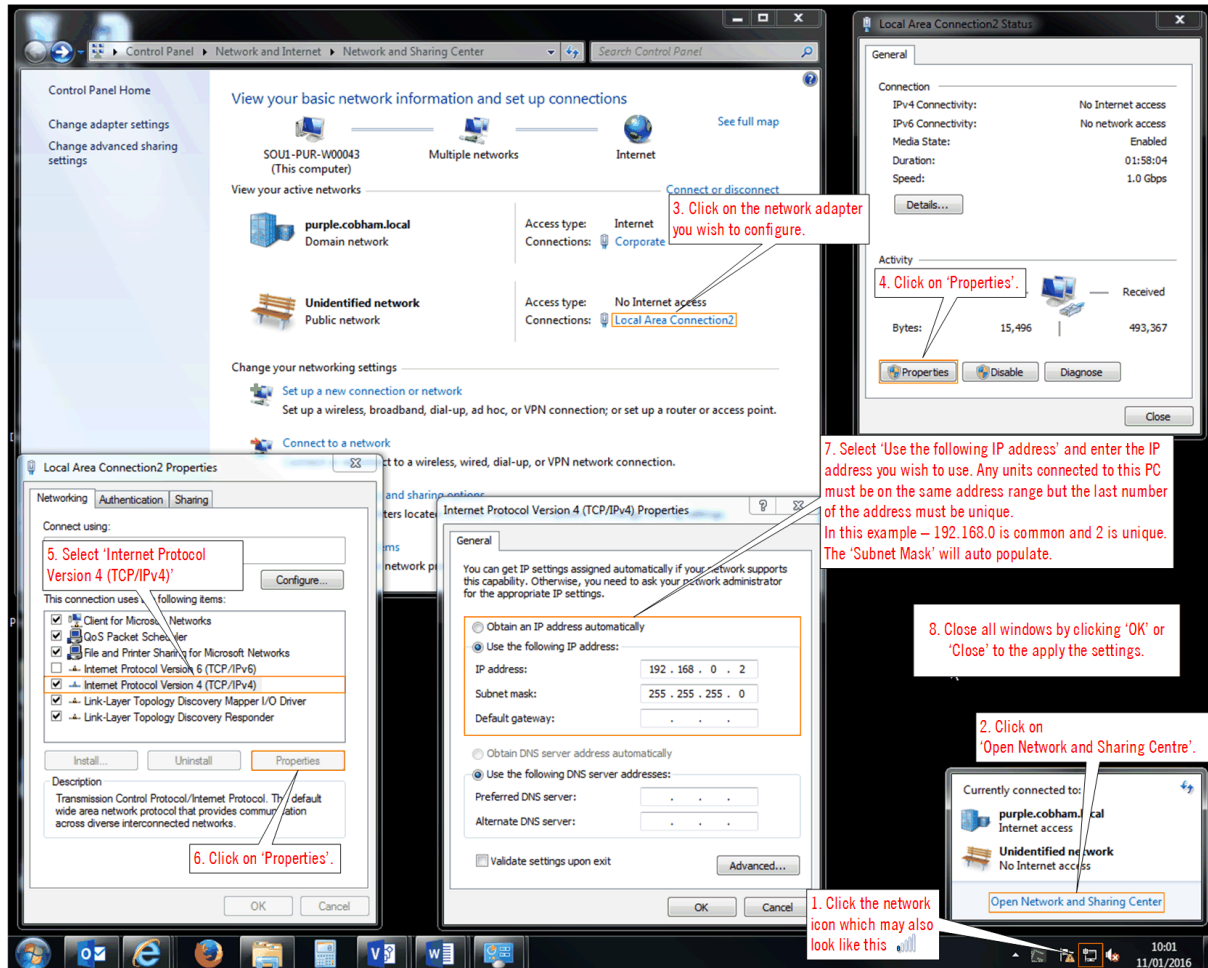


Figure 11-1 How to configure a PC IP address

11.2 AEON Transmitter Pinouts

CAMERA

Circular Hirose 10-way – HR10A-10R-10P (73)

Pin	Function
1	RS422 TX (H)
2	RS422 TX (C)
3	RS422 RX (H)
4	RS422 RX (C)
5	GND
6	RS232 TX
7	RS232 RX
8	N/C
9	N/C
10	GND

Tally

OB Lemo 5-way – EGG.OB.305.CLL

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

DATA

OB Lemo 4-way – EEA.OB.304.CLL

Pin	Function
1	DATA_TX_RS232
2	DATA_RX_RS232
3	PA_TDD
4	GND

Audio 1 and 2

OB Lemo 5-way – EEA.OB.305.CLL

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

Power

OB Lemo 4-way – EEG.OB.304.CLL

Pin	Function
1	VIN
2	VIN
3	GND
4	GND

11.3 AEON Decoder/Encoder Pinouts

RS-232

Pin	Function
1	N/C
2	RS232 TX
3	RS232 RX
4	N/C
5	GND
6	N/C
7	N/C
8	N/C
9	N/C

Audio Inputs

OB Lemo 5-way – EEA.0B.305.CLL

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

Audio Outputs

OB Lemo 5-way – EEA.0B.305.CLL

Pin	Function
1	AUD_OUT_L+
2	AUD_OUT_L-
3	GND
4	AUD_OUT_R+
5	AUD_OUT_R-

12. Appendix B – Getting Technical Support

12.1 Documentation and Software

It is DTC's practice 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 login and create your own password followed by a confirmation email. Once you have done this you will then be able log into your account.

12.2 Repairs

Do not attempt any repair, contact DTC Technical Support.

12.3 Contact Technical Support

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

- Post: DTC – Solent, Fusion 2, 1100 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)

We undertake to get a first response to you in less than one working day and a progress update at least every two weeks.

12.1 Using the DTC RMA Service

If there is a problem and all troubleshooting steps have been unsuccessful, you may need to contact DTC for Return Material Authorisation (RMA) service.

Step 1: Email DTC

To return something to Solent please Email solent.customerhub@domotactical.com. We will then send you an RMA request form to complete and return. We'll then send you an RMA number and shipping instructions.

Step 2: Save your Personal Kit

Remove all personal kit or media from the device.

Step 3: Pack the Unit

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.

Step 4: Prepare an Information Sheet

Include a sheet with the following information.

Note: Please keep a copy of this sheet for your records.

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

Step 5: 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.

Step 6: Send the Box to DTC

Send the box using your normal shipping process.

13. Appendix C – Cautions and Approvals

13.1 Cautions and Warnings

These cautions and warnings may or may not apply to your installation. However, we would ask that you read them to assess their relevance.

Area	Note
Enclosures	<p>Do not remove any factory installed screws or fastenings. Damage to the units may result and void any warranties.</p> <p>Only authorised, trained personnel should open the product. There are no functions that required the user to gain access to the interior of the product. There are no user serviceable parts inside.</p>
Environment	<p>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.</p>
Power supply	<p>Ensure that the power supply arrangements are adequate to meet the stated requirements of each product. Observe all electrical safety precautions.</p>
Electro static discharge (ESD) precautions	<p>ESD guidelines must be followed when necessary.</p>
Lightning strike	<p>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.</p>
Working at height	<p>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.</p>
Cables	<p>Connecting cables should not be positioned where they are likely to become damaged or where they may present a trip hazard.</p>
Thermal control system	<p>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.</p>
RF emissions	<p>When using this device please ensure a distance of 20cm is maintained between your device and your body while the device is transmitting.</p>
Aircraft safety	<p>Use of this equipment on board aircraft is strictly forbidden. Use of radio transmitter equipment in an aircraft can endanger navigation and other systems.</p>

13.2 EMC/Safety and Radio Approvals

The equipment has been designed to meet and has been tested against harmonized EMC and safety standards.

13.3 CE Marking

The CE mark is affixed to all DTC products, the CE Declaration of Conformity as well as the technical file is available on request.

14. Appendix D – Care and Maintenance

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

14.1 Caring for your 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 submerge 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.

14.2 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

14.3 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.

14.4 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

14.5 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

15. Appendix E – 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 which 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 (270Mbps) 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.
Amplification	The process of increasing the strength (current, voltage or power) of a signal.
Analogue	Analogue transmission is a method of conveying voice, data, image, signal or video information using a continuous signal which varies in amplitude, phase, or some other property in proportion to that of a variable.
Antenna	An antenna is a transducer designed to radiate or receive electromagnetic energy (generally RF).
Antenna Bandwidth	The frequency range over which a given antenna will accept signals.
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	The width of a band of frequencies used for a particular purpose.
BNC	A very common type of RF connector used for terminating coaxial cable.

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 which converts compressed digital video or audio data to a format suitable for monitoring.

D	Definition
Demodulate	To recover the information originally impressed on the radio wave.
Downconverter	A device which converts microwave frequencies to UHF frequencies for use in DTC receivers.

E	Definition
Elementary Stream (ES)	These streams contain only one MPEG video or audio channel. Elementary streams are required if you intend to use Milestone or any player that cannot operate with transport streams.
Encoder	A processor in a transmitter which 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.
Firmware	Software which is installed directly on a device and is intended specifically for that device and is used to control it.
FPGA	A Field-Programmable Gate Array is an integrated circuit which can be programmed to perform complex logic functions. The software can be upgraded in the field, hence, field-programmable.
Frequency	The rate at which a process repeats itself. In radio communications, the frequency of electromagnetic waves is expressed in Hertz (Hz). Electromagnetic waves also have a property called wavelength, which is inversely proportional to the frequency.

G	Definition
Gain	An increase in signal strength, typically by an amplifier.
GHz	One gigahertz is equal to 1,000,000,000Hz or 1,000MHz.
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.
Impedance	The total opposition offered by a circuit or component to the flow of alternating current.

L	Definition
LOS	Line-of-sight propagation refers to electromagnetic radiation which travels in a direct path from transmitter to receiver.

M	Definition
MHz	Megahertz is equal to 1,000,000 Hz.
mW	The milliwatt is equal to one thousandth (10^{-3}) of a watt.
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 <i>want</i> to receive the data.

N	Definition
NLOS	Non-line-of-sight propagation refers to electromagnetic radiation which travels in a path which is 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.
Oscillation	A periodic, repetitive motion or set of values (voltage, current, velocity).

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.
Propagation	A phenomenon by which any wave moves from one point to another; the travel of electromagnetic waves through space or along a transmission line.

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 (RTSP) 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.
Radio Frequency (RF)	Any frequency of electrical energy capable of propagation in the range of around 20kHz to 300GHz.

S	Definition
SDI	Serial Digital Interface (SDI) 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 (TS)	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 (UDP) 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 shape in cross section, used to connect a high power amplifier to the antenna.