



# AERO.10 DTV Audio Processor User Guide

User Guide version 0.5

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## REGULATORY NOTICES, FUSING, SUPPORT CONTACT INFORMATION, AND LINEAR ACOUSTIC LIMITED WARRANTY

### FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

### CANADA

This Class A digital apparatus complies with Canadian ICES-003.

### UL



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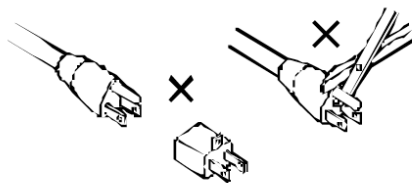
**WARNING:** Troubleshooting must be performed by a trained technician. Do not attempt to service this equipment unless you are qualified to do so.

Check that the correct fuses have been installed. To reduce the risk of fire, replace only with fuses of the same type and rating.

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Exposed portions of the power supply assembly are electrically “hot”. In order to reduce the risk of electrical shock, the power cord **MUST** be disconnected when the power supply assembly is removed.

The ground terminal of the power plug is connected directly to the chassis of the unit. For continued protection against electric shock, a correctly wired and grounded (earthed) three-pin power outlet must be used. Do not use a ground-lifting adapter and never cut the ground pin on the three-prong plug.



## UK

As the colours of the cores in the mains lead may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The core that is coloured green and yellow must be connected to the terminal in the plug identified by the letter E or by the earth symbol or coloured green or green and yellow.
- The core that is coloured blue must be connected to the terminal that is marked with the letter N or coloured black.
- The core that is coloured brown must be connected to the terminal that is marked with the letter L or coloured red.
- This apparatus must be earthed.

## EU

This equipment complies with the EMC requirements of EN55103-1 and EN55103-2 when operated in an E2 environment in accordance with this manual.

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### IMPORTANT SAFETY NOTICE

THIS UNIT COMPLIES WITH THE SAFETY STANDARD EN60065. THE UNIT SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND NO OBJECTS FILLED WITH LIQUID S, SUCH AS COFFEE CUPS, SHALL BE PLACED ON THE EQUIPMENT. TO ENSURE SAFE OPERATION AND TO GUARD AGAINST POTENTIAL SHOCK HAZARD OR RISK OF FIRE, THE FOLLOWING MUST BE OBSERVED:

- ENSURE THAT YOUR MAINS SUPPLY IS IN THE CORRECT RANGE FOR THE INPUT POWER REQUIREMENT OF THE UNIT.
- ENSURE FUSES FITTED ARE THE CORRECT RATING AND TYPE AS MARKED ON THE UNIT.
- THE UNIT MUST BE EARTHED BY CONNECTING TO A CORRECTLY WIRED AND EARTHED POWER OUTLET.
- THE POWER CORD SUPPLIED WITH THIS UNIT MUST BE WIRED AS FOLLOWS:

LIVE—BROWN NEUTRAL—BLUE EARTH—GREEN/YELLOW

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### IMPORTANT – NOTE DE SECURITE

CE MATERIEL EST CONFORME À LA NORME EN60065. NE PAS EXPOSER CET APPAREIL AUX CLABOUSSURES OU AUX GOUTTES DE LIQUIDE. NE PAS POSER D'OBJETS REMPLIS DE LIQUIDE, TELS QUE DES TASSES DE CAFÉ, SUR L'APPAREIL. POUR VOUS ASSURER D'UN FONCTIONNEMENT SANS DANGER ET DE PRÉVENIR TOUT CHOC ÉLECTRIQUE OU TOUT RISQUE D'INCENDIE, VEILLEZ À OBSERVER LES RECOMMANDATIONS SUIVANTES.

- LE SELECTEUR DE TENSION DOIT ÊTRE PLACÉ SUR LA VALEUR CORRESPONDANTE À VOTRE ALIMENTATION RÉSEAU.
- LES FUSIBLES DOIVENT CORRESPONDRE À LA VALEUR INDIQUÉE SUR LE MATERIEL.
- LE MATERIEL DOIT ÊTRE CORRECTEMENT RELIÉ À LA TERRE.
- LE CORDON SECTEUR LIVRÉ AVEC LE MATERIEL DOIT ÊTRE CABLÉ DE LA MANIÈRE SUIVANTE:

PHASE—BRUN NEUTRE—BLEU TERRE—VERT/JAUNE

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### WICHTIGER SICHERHEITSHINWEIS

DIESES GERÄT ENTSPRICHT DER SICHERHEITSNORM EN60065. DAS GERÄT DARF NICHT MIT FLÜSSIGKEITEN (SPRITZWASSER U SW.) IN BERÜHRUNG KOMMEN; STELLEN SIE KEINE GEFÄßE, Z.B. KAFFEETASSEN, AUF DAS GERÄT. FÜR DAS SICHERE FUNKTIONIEREN DES GERÄTES UND ZUR UNFALLVERHÜTUNG (ELEKTRISCHER SCHLAG, FEUER) SIND DIE FOLGEND EN REGELN UNBEDINGT EINZUHALTEN:

- DER SPANNUNGSWÄHLER MUß AUF IHRE NETZSPANNUNG EINGESTELLT SEIN.
- DIE SICHERUNGEN MÜSSEN IN TYP UND STROMWERT MIT DEN ANGABEN AUF DEM GERÄT ÜBEREINSTIMMEN.
- DIE ERDUNG DES GERÄTES MUß ÜBER EINE GEERDETE STECKDOSE GEWÄHRLEISTET SEIN.
- DAS MITGELIEFERT E NETZKABEL MUß WIE FOLGT VERDRAHTET WERDEN:  
PHASE—BRAUN NULLEITER—BLAU ERDE—GRÜN/GELB

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### NORME DI SICUREZZA – IMPORTANTE

QUESTA APPARECCHIATURA È STATA COSTRUITA IN ACCORDO ALLE NORME DI SICUREZZA EN60065. IL PRODOTTO NON DEVE ESSERE SOTTOPOSTO A SCHIZZI, SPRUZZI E GOCCIOLAMENTI, E NESSUN TIPO DI OGGETTO RIEMPITO CON LIQUIDI, COME AD ESEMPIO TAZZE DI CAFFÈ, DEVE ESSERE APPOGGIATO SUL DISPOSITIVO. PER UNA PERFETTA SICUREZZA ED AL FINE DI EVITARE EVENTUALI RISCHI DI SCOSSA ELETTRICA O D'INCENDIO VANNO OSSERVATE LE SEGUENTI MISURE DI SICUREZZA:

- ASSICURARSI CHE IL SELETTORE DI CAMBIO TENSIONE SIA POSIZIONATO SUL VALORE CORRETTO.
- ASSICURARSI CHE LA PORTATA ED IL TIPO DI FUSIBILI SIANO QUELLI PRESCRITTI DALLA CASA COSTRUTTRICE.
- L'APPARECCHIATURA DEVE AVERE UN COLLEGAMENTO DI MESSA A TERRA BEN ESEGUITO; ANCHE LA CONNESSIONE RETE DEVE
- AVERE UN COLLEGAMENTO A TERRA.
- IL CAVO DI ALIMENTAZIONE A CORREDO DELL'APPARECCHIATURA DEVE ESSERE COLLEGATO COME SEGUE:  
FILO TENSIONE—MARRONE NEUTRO—BLU MASSA—VERDE/GIALLO

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### AVISO IMPORTANTE DE SEGURIDAD

ESTA UNIDAD CUMPLE CON LA NORMA DE SEGURIDAD EN60065. LA UNIDAD NO DEBE SER EXPUESTA A GOTEO O SALPICADURAS Y NO DEBEN COLOCARSE SOBRE EL EQUIPO RECIPIENTES CON LIQUIDOS, COMO TAZAS DE CAFE. PARA ASEGURARSE UN FUNCIONAMIENTO SEGURO Y PREVENIR CUALQUIER POSIBLE PELIGRO DE DESCARGA O RIESGO DE INCENDIO, SE HAN DE OBSERVAR LAS SIGUIENTES PRECAUCIONES:

- ASEGÚRESE QUE EL SELECTOR DE TENSIÓN ESTÉ AJUSTADO A LA TENSIÓN CORRECTA PARA SU ALIMENTACIÓN.

- *ASEGÚRESE QUE LOS FUSIBLES COLOCADOS SON DEL TIPO Y VALOR CORRECTOS, TAL COMO SE MARCA EN LA UNIDAD.*
- *LA UNIDAD DEBE SER PUESTA A TIERRA, CON ECTÁNDOLA A UN CONECTOR DE RED CORRECTAMENTE CABLEADO Y PUESTO A TIERRA.*
- *EL CABLE DE RED SUMINISTRADO CON ESTA UNIDAD, DEBE SER CABLEADO COMO SIGUE:  
VIVO—MARRÓN NEUTRO—AZUL TIERRA—VERDE/AMARILLO*

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### **VIKTIGA SÄKERHETSÅTGÄRDER!**

*DENNA ENHET UPPFYLLER SÄKERHETS STANDARD EN60065. ENHETEN FÅR EJ UTSÄTTAS FÖR YTTRE ÅVERKAN SAMT FÖREMÅL INNEHÅLLANDE VÄTSKA, SÅSOM KAFFEMUGGAR, FÅR EJ PLACERAS PÅ UTRUSTNINGEN." FÖR ATT GARANTERA SÄKERHETEN OCH GÅRDERA MOT EVENTUELL ELCHOCK ELLER BRANDRISK, MÅSTE FÖLJANDE OBSERVERAS :*

- *KONTROLLERA ATT SPÄNNINGSVÄLJAREN ÄR INSTÄLLD PÅ KORREKT NÄTSPÄNNING.*
- *KONTROLLERA ATT SÄKRINGARNA ÄR AV RÄTT TYP OCH FÖR RÄTT STRÖMSTYRKA SÅ SOM ANVISNINGARNA PÅ ENHETEN FÖRESKRIVER.*
- *ENHETEN MÅSTE VARA JORDAD GENOM ANSLUTNING TILL ETT KORREKT KOPPLAT OCH JORDAT EL-UTTAG.*
- *EL-SLADDEN SOM MEDFÖLJER DENNA ENHET MÅSTE KOPPLAS ENLIGT FÖLJANDE:  
FAS—BRUN NEUTRAL—BLÅ JORD—GRÖN/GUL*

---

### **BELANGRIJK VEILIGHEIDS-VOORSCHRIFT:**

*DEZE UNIT VOLDOET AAN DE EN60065 VEILIGHEIDS-STANDAARDS. DIT APPARAAT MAG NIET ORDEN BLOOTGESTELD AAN VOCHT. VANWEGE HET RISICO DAT ER DRUPPELS IN HET APPARAAT VALLEN, DIEN T U ER GEEN VLOEISTOFFEN IN BEKERS OP TE PLAATSEN. VOOR EEN VEILIG GEBRUIK EN OM HET GEVAAR VAN ELECTRICITEIT EN HET RISICO VAN BRAND TE VERMIJDEN, DIENEN DE VOLGENDE REGELS IN ACHT TE WORDEN GENOMEN:*

- *CONTROLEER OF DE SPANNINGSCAROUSSEL OP HET JUISTE VOLTAGE STAAT.*
- *GEbruik ALLEEN ZEKERINGEN VAN DE AANGEGEVEN TYPEN EN WAARDEN.*
- *AANSLUITING VAN DE UNIT ALLEEN AAN EEN GEAARDE WANDCONTACTDOOS.*
- *DE NETKABEL DIE MET DE UNIT WORDT GELEVERD, MOET ALS VOLGT WORDEN AAN GESLOTEN:*

*FASE—BRUIN NUL—BLAUW AARDE—GROEN/GEEL*

### **FUSING INFORMATION**



**WARNING:** To reduce the risk of fire, replace fuses only with the same type and rating.

---

This product uses a universal switching power supply that handles the full range of nominal mains voltages between 90 and 264 VAC and any frequency between 50 Hz and 60 Hz.

The Main fuse rating is T 1A L (1 Amp, 250 V, 20 mm, time-lag, low breaking capacity) for all operating voltages. To check the main external fuse:

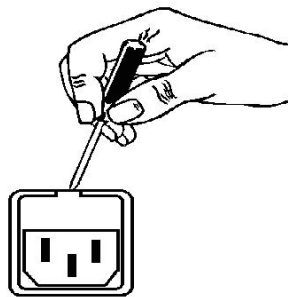


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**WARNING:** Power to the unit must be off when the following steps are performed. Ensure that the main power cable to the unit is not connected to a power source.

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1. Open the fuse compartment door in the AC power input housing with a small flat blade screwdriver. Carefully pull out the fuse carrier.



2. Check that the replacement fuse has the correct rating. The fuse carrier must be inserted into the compartment carefully. Do not force the carrier into the compartment or both could be damaged.
3. Snap the fuse compartment door closed.

The switching power supply contains a separate internal fuse. Most fault conditions should be protected by the main fuse.

If you find it necessary to replace the internal fuse, be certain to replace it with a fuse of the same type and rating as printed on the switching power supply board.

## NOTICE

All versions, claims of compatibility, trademarks, etc., of hardware and software products not made by Linear Acoustic which are mentioned in this manual or accompanying material are informational only. Linear Acoustic makes no endorsement of any particular product for any purpose, nor claims any responsibility for operation or accuracy.

We reserve the right to make improvements or changes in the products described in this manual which may affect the product specifications, or to revise the manual without notice.

## UPDATES

The operation of this product is determined largely by software. From time to time we may release new versions to add features and fix bugs. Check the Linear Acoustic web site for the latest information.

## FEEDBACK

We welcome feedback on any aspect of this product or this manual. In the past, many good ideas from users have made their way into software revisions or new products. Please contact us with your comments.

## SERVICE

You must contact Linear Acoustic before returning any equipment for factory service. We will need your unit's serial number, located on the back of the unit. Linear Acoustic will issue a return authorization number which must be written on the exterior of your shipping container. Please do not include cables or accessories unless specifically requested by the Technical Support Engineer. Be sure to adequately insure your shipment for its replacement value. Packages without proper authorization may be refused. US customers, please contact Linear Acoustic Technical Support at +1 (717) 735-3611. All other customers should contact local representative to make arrangements for service.

## SUPPORT

For any billing or non-emergency technical questions please call our main office at +1 (717) 735-3611 between the hours of 9:00am – 5:00pm Eastern time, Monday through Friday.

24/7 after hours support is provided **for off-air emergencies** by calling +1 (717) 735-3611 and listening to the entire message for instructions and prompts.

Our Fax number is +1-717-735-3612.

Technical support via e-mail is available at [support@linearacoustic.com](mailto:support@linearacoustic.com)

All product questions or inquiries, please email [sales@linearacoustic.com](mailto:sales@linearacoustic.com)

The Linear Acoustic web site has a wealth of information which may be useful for product selection and support. The URL is [www.linearacoustic.com](http://www.linearacoustic.com).

Registered users of the website can download user manuals and software updates at any time.

## **LINEAR ACOUSTIC LIMITED WARRANTY**

**DISCLAIMER OF WARRANTIES:** Linear Acoustic products are warranted against defects in material and workmanship for a period of 2 years from the date of purchase. THERE ARE NO OTHER IMPLIED OR EXPRESS WARRANTIES AND NO WARRANTY FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

If the date the customer's notice of warranty claim is received by Linear Acoustic (such date the "**Warranty Claim Notice Date**") is within the first 90 days following the Receipt Date, Linear Acoustic will pay the costs of shipping such warranted Product to and from the end user's location, and the cost of repair or replacement of such warranted Product.

If the Warranty Claim Notice Date occurs after the first 90 days following the Receipt Date and before the end of the second (2nd) year, the customer will pay the freight to return the warranted Product to Linear Acoustic. Linear Acoustic will then, at its sole discretion, repair or replace the warranted Product and return it to the end user at Linear Acoustic expense.

In each of the above, the unit is to be returned directly to Linear Acoustic with a return authorization (RA) number clearly marked on the packaging. Please note, this RA number must be present or package will be refused and returned to sender.

**The end user will in all cases be responsible for all duties and taxes associated with the shipment, return and servicing of the warranted Product.**

No distributor, dealer, or reseller of Linear Acoustic products is authorized under any circumstances to extend, expand or otherwise modify in any way the warranty provided by Linear Acoustic, and any attempt to do so is null and void and shall not be effective as against Linear Acoustic or its Affiliates.

Out of warranty units returned to the factory for repair may be subject to a \$500 evaluation fee, which must be prepaid prior to shipping the unit to Linear Acoustic. If no repairs are required, the \$500 fee will be retained by Linear Acoustic as an evaluation charge. If repairs are required, the \$500 fee will be applied to the total cost of the repair.



All requests for repairs MUST include the unit serial number to ensure quick and accurate service.

**DEFECTS CAUSED BY UNAUTHORIZED MODIFICATIONS, MISUSE OR ACCIDENTS, UNAUTHORIZED CUSTOMER REPAIRS, OR ANY FURTHER DAMAGE CAUSED BY INADEQUATE PACKAGING FOR SERVICE RETURN ARE NOT COVERED BY THIS WARRANTY.**

**PLEASE SAVE THE SHIPPING CARTON AND ALL PACKING MATERIALS. FAILURE TO RETURN UNIT IN ORIGINAL SHIPPING CARTON AND PACKING MATERIALS WILL RESULT IN A CHARGE FOR NEW SHIPPING MATERIALS.**

**LIMITATION OF PERIOD OF ACTION ON CONTRACT:** No action, regardless of form, arising out of the transactions under this agreement may be brought by buyer, its successors, agents and/or assigns, more than two years from date of purchase.

**LIMITATION OF LIABILITY:** It is understood and agreed that the liability of Linear Acoustic whether in contract, in tort, under any warranty, in negligence or otherwise shall not exceed the cost of repair or replacement of the defective components and under no circumstances shall Linear Acoustic® be liable for incidental, special, direct, indirect or consequential damages, or loss of use, revenue or profit even if Linear Acoustic® or its agents have been advised, orally or in writing, of the possibility of such damages.

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## Table of Contents

Chapter 1: Introduction to the AERO.10.....	15
1.1. Introduction.....	15
1.2. Overview .....	15
1.3. Unpacking and Inspection .....	16
1.4. Unit Overview .....	16
1.4.1. Front panel.....	16
1.4.2. Rear panel.....	17
1.5. Connections .....	17
1.5.1. Front Panel Headphone Connection .....	17
1.5.2. Front Panel USB Connection.....	18
1.5.3. Analog I/O .....	18
1.5.4. Network Connection .....	18
1.5.5. SDI I/O.....	18
1.5.6. AES I/O.....	18
1.5.7. AES Ref.....	18
1.5.8. GPI/O .....	19
1.5.9. AC Power Connection .....	19
1.5.10. Unused / Reserved Connections .....	19
1.6. Installation and Mounting .....	20
1.6.1. Installation .....	20
1.6.2. Power.....	20
1.7.1. Block diagram .....	20
Chapter 2: Getting Started .....	22
2.1. Start Here.....	22
2.2. Quick Start.....	22
2.2.1. Racking and Power .....	22
2.2.2. Installing NfRemote.....	22
2.2.3. Front Panel Operation.....	23
2.2.4. Unlocking the front panel .....	23
2.2.5. Network Configuration .....	25

2.2.6.	Clock Reference.....	27
2.2.7.	I/O Configuration .....	28
2.2.7.1.	Input Source Selection: .....	28
2.2.7.2.	Output Routing:.....	28
2.2.7.3.	SDI Output Routing:.....	29
2.2.8.	Setting the Output Level to the Target Level.....	29
Chapter 3: Front Panel Configuration.....		31
3.1.	Front Panel Operation.....	31
3.1.1.	Front Panel.....	32
3.1.2.	Unlocking The Front Panel.....	32
3.2.	Network Configuration .....	34
3.2.1.	Changing the IP configuration to a Static IP Address .....	34
Chapter 4: Remote / IP Control.....		35
4.1.	Overview .....	35
4.2.	NfRemote .....	35
4.2.1.	Installation.....	36
4.2.2.	Initialization .....	37
4.2.3.	Getting Started Using NfRemote .....	39
4.2.4.	Tree and Tabbed Navigation.....	40
4.2.4.1.	Tree Navigation.....	40
4.2.4.2.	Tabbed Navigation.....	41
4.2.5.	Display Configuration .....	42
4.2.6.	Configuring Meter Displays.....	43
4.2.7.	Configuring Loudness Meters.....	46
4.3.	HTTP Server .....	47
4.3.1.	HTTP Access IP Whitelist .....	48
4.3.1.1.	Front Panel.....	48
4.3.1.2.	NfRemote .....	49
4.3.2.	Accessing the HTTP homepage.....	49
4.3.3.	Downloading NfRemote.....	51
4.3.4.	Loudness Measurement Logs .....	51
4.3.4.1.	Downloading the Loudness Logs.....	54
Chapter 5: Important Setup Parameters .....		56
5.1.	Important Setup Parameters.....	56

5.2. Unit Configuration Setup Parameters .....	56
5.2.1. Password.....	56
A password must ALWAYS be set in the AERO.10. The factory set password is 1234. If you choose to change the password keep it in a safe place. If the password is lost or removed the unit must be sent back to the factory to recover front panel and remote control of the unit. ....	
5.2.2. Time Zone .....	57
5.2.3. Time .....	57
5.2.4. Network Time Protocol (NTP) Reference.....	57
5.2.5. Clock Reference.....	57
5.2.6. Input Source .....	58
5.2.7. Sample Rate Converter (SRC) Bypass.....	58
5.2.8. Mute Input 3-6.....	58
5.2.9. Output Routing (AES).....	59
5.2.10. Output Routing (SDI).....	59
5.2.11. SDI Embedding.....	59
5.3. Audio Processing Setup .....	60
5.3.1. UPMAX II Upmixing.....	60
5.3.2. DRC Program 1 .....	61
5.3.3. DRC Program 2 and DRC Program 3 .....	61
5.3.4. Video Delay .....	61
5.3.5. Audio Delay.....	61
Chapter 6: Specifications.....	63
6.1. Physical.....	63
6.2. Electrical.....	63
6.3. Audio.....	65
6.4. Other .....	65
Appendix A: AEROMAX DRC Presets.....	66
Fine Arts 5B Gen.....	66
ITU 5B Loudness Lim .....	66
Music 5B Hvy .....	66
MVPD 5B Gen.....	66
Net 5B Limit .....	66
Protection Limit.....	67
Reference Settings.....	67

Sports 5B Gen .....	67
TV 4B Gen.....	67
TV 5B Gen (Default).....	67
TV 5B Hvy.....	67
TV 5B Light .....	68
TV 5B Loud .....	68
Appendix B: Connector Pinout.....	69
Analog I/O.....	69
GPI/O.....	70

## Table of Figures

Figure 1: AERO.10 Front Panel.....	16
Figure 2: AERO.10 Rear Panel.....	17
Figure 3: Block Diagram - 5.1-ch instance.....	21
Figure 4: Block Diagram - 2-ch instance.....	21
Figure 5: Locked Front Panel Screen .....	24
Figure 6: Keyboard Screen .....	24
Figure 7: Front Panel Screen after unlocking.....	24
Figure 8: NfRemote IP Configuration Screen.....	26
Figure 9: NfRemote Warning Screen.....	26
Figure 10: NfRemote Hardware I/O Setup .....	27
Figure 11: Input Source Selection .....	28
Figure 12: Output Routing Menu (SDI) .....	29
Figure 13: SDI Embedding Menu .....	29
Figure 14: Adjusting Output Level .....	30
Figure 15: Menu Knob .....	31
Figure 16: Locked Front Panel Screen.....	32
Figure 17: Keyboard Screen.....	33
Figure 18: Front Panel Screen after unlocking.....	33
Figure 19: NfRemote Install Screen.....	37
Figure 20: NfRemote Start Screen.....	37
Figure 21: NfRemote Connection Screen .....	38
Figure 22: NfRemote Toolbar.....	40
Figure 23: NfRemote in Tree Navigation Mode.....	41
Figure 24: "Breadcrumbs" which are shown in Tree Navigation Mode .....	41
Figure 25: NfRemote Tabbed Navigation View .....	42
Figure 26: NfRemote Menu Window.....	43
Figure 27: Meter Display Presets.....	43
Figure 28: Meter Display Preset 1 Configuration Example.....	44
Figure 29: RTA Meter Configuration Panel .....	46
Figure 30: Loudness Meter Configuration Panel .....	47
Figure 31: Front Panel Navigation to Configure IP settings.....	48
Figure 32: NfRemote Whitelist Configuration Panel.....	49
Figure 33: AERO.10 HTTP Home Page .....	50
Figure 34: Error Message For Computers Not On Whitelist.....	50
Figure 35: Link to Download NfRemote .....	51
Figure 36: Links To Loudness Logs .....	53
Figure 37: Loudness Log - Webpage View.....	53
Figure 38: Downloading Loudness Logs.....	54
Figure 39: Loudness Log Opened In Microsoft Excel.....	55
Figure 40: Analog I/O Connector Pinout - Rear Panel View .....	69
Figure 41: GPI/O Connector Pinout - Rear Panel View .....	70

# Chapter 1: Introduction to the AERO.10

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## 1.1. Introduction

Congratulations on your purchase of the Linear Acoustic AERO.10 DTV Audio Processor! It is a state-of-the-art, adaptive, multiband, broadcast audio/loudness processor.

This user guide is intended to be read while in front of a running AERO.10 unit. It is most helpful if the source(s) that will be used is actually connected to the AERO.10. Doing this provides feedback to the user, via the meters and IP audio monitoring, about the configuration changes being made.

To make learning your way around the AERO.10 as useful and rewarding as possible, there is some information that you should have at hand at you start:

- The IP address and subnet mask intended to be assigned to the AERO.10.
- Any gateway and DNS information for the network it will be attached to.
- NTP server address(s).
- The IP address of the PC that will be used to connect to the AERO.10.
- If using an SDI Input, which channels of the SDI input stream contain the audio program(s) to be processed.
- If outputting signals via the SDI Output, which channels of the SDI Output stream the loudness controlled audio program(s) are to be embedded in.

Having this information will allow you to configure the unit for use as you learn to navigate the AERO.10 using both the front panel and NfRemote.

## 1.2. Overview

The AERO.10 can apply loudness control and upmixing to ten input channels. It outputs 5.1 processed channels, and two separate two-channel programs. The two stereo output programs can be downmixes of the 5.1, independent stereo programs, or paralleled outputs of two different single channel sources.

The AERO.10 includes the following features:

- Program configurations: 5.1+2+2 or 2+2+2 with support for Local input on one of the 2-ch inputs
- AEROMAX® multiband loudness processing, which provides ATSC, ITU and EBU compliance.

- ITU-R BS.1770-3 loudness measurement for each output program allows loudness target calibration and loudness monitoring.
- Dual, selectable upmixers for main and local sources utilizing industry-standard UPMAX® II algorithm
- Full-time Lt/Rt or Lo/Ro downmix of the main 5.1-channel program
- HD/SD-SDI I/O for embedded audio
- 8-channels of AES-3 I/O
- 2-channel analog audio I/O
- Video compensating delay
- Dual, redundant, auto-ranging power supplies
- GPI and Ethernet control
- NfRemote IP based full function remote control for configuration and monitoring

### 1.3. Unpacking and Inspection

Before unpacking the unit, inspect the outer carton for shipping damage. If the carton shows damage, inspect the unit in those areas. Please save the carefully designed shipping carton and packing materials. In the unlikely event that the unit needs to be returned to the factory, alternate cartons or packing materials may not be adequate and can cause damage not covered by warranty.

The following essential items are provided with the unit:

- IEC power cord (style matches country of order)
- Quick-start sheet to get you up and running
- USB memory stick containing documentation and NfRemote control software
- A handy black pen

### 1.4. Unit Overview

This section introduces you to the AERO.10 and its views:

#### 1.4.1. Front panel



Figure 1: AERO.10 Front Panel



On the front panel of the AERO.10, you will find:

- Power Indicator
- LCD display
- Rotary joystick encoder
- Headphone volume control
- Headphone jack
- USB connector

The LCD display provides the user with visual feedback and interaction as to what the AERO.10 is doing, parameter settings, and input signal status.

It is possible to configure the unit with the front panel controls and display, but doing so by way of the remote client, NfRemote, is much easier and offers a number of benefits.

Operation of the AERO.10 via the front panel, and via NfRemote is described later in this manual.

### 1.4.2. Rear panel



### Figure 2: AERO.10 Rear Panel

The rear panel of the AERO.10 is where most connections are made.

## 1.5. Connections

This section covers the connections found on the AERO.10. Except where noted, all connections are on the rear panel of the unit.

### 1.5.1. Front Panel Headphone Connection

A ¼" headphone output, with user selectable patch point is included on the front panel of the AERO.10. A dedicated volume control for the headphone output is included on the front panel directly next to the headphone output connection.

### 1.5.2. Front Panel USB Connection

This USB connection on the front panel allows users to upgrade operating software and download loudness logs using a USB thumb drive. This would generally only be used if the AERO.10 is not connected to an IP network.

### 1.5.3. Analog I/O

A 2-channel, +4 dBu, balanced analog input and output is included on a DB9 connector. Pinout information for wiring harnesses is listed in Appendix B.

### 1.5.4. Network Connection

An auto-sensing 100/1000 BASE-T Ethernet port is provided via a standard RJ45 connector. When connecting directly to a computer, a crossover cable is not required.

#### *Note!*

---

When using the Ethernet port, be sure to connect it to a stable and robust network.

---

### 1.5.5. SDI I/O

An autosensing HD-/SD-SDI input and output connection are included on the AERO.10. All 16-channels of an SDI stream are available for de-embedding, embedding, and pair shuffling.

### 1.5.6. AES I/O

8 channels of digital audio are supported via AES-3. There are 4 AES input connections and 4 AES Output connections provided via 75 $\Omega$  BNC connectors to support this.

### 1.5.7. AES Ref

An AES Reference input is available. A 48 kHz DARS (Digital Audio Ref Signal), or any AES signal, but not video is accepted as an input signal. Use only if SDI embedding is disabled.

***Note!***

---

All BNC inputs are 75-Ω internally terminated. This is true whether they are SDI or AES inputs.

---

### **1.5.8. GPI/O**

GPI functionality is provided via a DB25 connector. Eight parallel inputs, 5-V TTL levels, active low are supported.

GPO functions are not currently supported.

Pinout information for wiring harnesses is listed in Appendix B.

### **1.5.9. AC Power Connection**

Two IEC universal power inlets are provided. These accept AC input from 95v up through 240v, at either 50 or 60 Hz.

### **1.5.10. Unused / Reserved Connections**

The following connections on the AERO.10 are currently unused.

- Metadata (DB9 connector)
- Reserved Ethernet (RJ45 connector)
- ENC Out (BNC connector)
- Vref In (BNC connector)
- LTC In (BNC connector)

## **1.6. Installation and Mounting**

### **1.6.1. Installation**

Use all four rack screws and allow 1RU of space above and below the unit whenever possible. There is an air intake on the right side of the unit and an exhaust fan on the left side that must not be blocked.

### **1.6.2. Power**

Dual, universal power supplies are provided along with two IEC power cables. Redundant power supplies are included primarily to protect you from interruptions on the power line. Ideally, each power supply should be fed from a different circuit, and it is strongly recommended that an uninterruptable power supply (UPS) is used on at least one of the power supplies. In all cases both supplies should be used.

There is no on/off switch, the AERO.10 will turn on when power is applied to either power supply. The unit may be shut down simply by removing power to it. No harm to the AERO.10 will occur in doing so.

## **1.7. Block diagram**

### **1.7.1. Block diagram**

The block diagram of the AERO.10 is shown below:

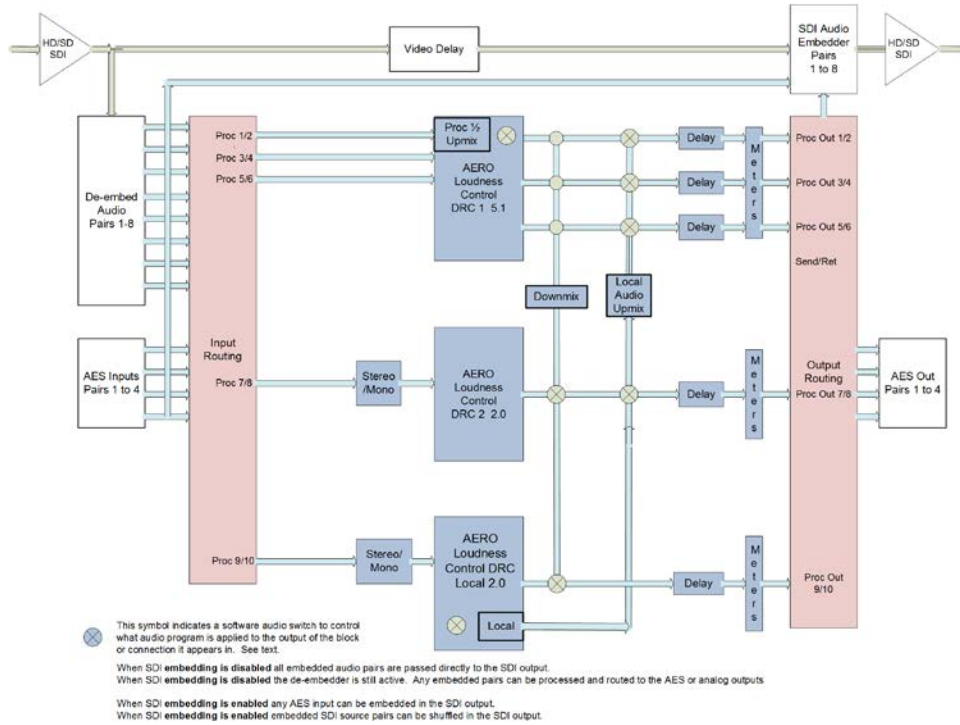


Figure 3: Block Diagram - 5.1-ch instance

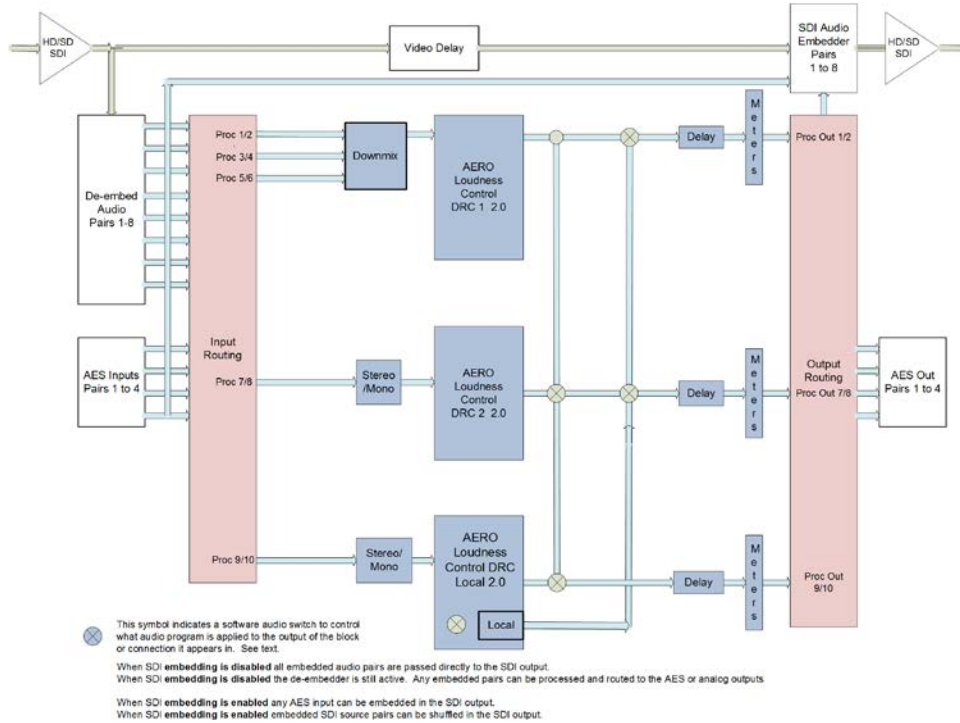


Figure 4: Block Diagram - 2-ch instance

# Chapter 2: Getting Started

---

## 2.1. Start Here

We realize that you are eager to get your AERO.10 up and running as soon as possible. Of course, we recommend that you take the time to read through this manual and thoroughly familiarize yourself with the AERO.10 first. Though to be completely honest, we sometimes have a hard time following our own advice when we get a new piece of equipment (we are audio and technology nerds ourselves, after all). So, as a reasonable compromise, we are including some simple setup instructions in this chapter, which should help you quickly get started while you read and understand this manual.

## 2.2. Quick Start

This quick start section is designed to walk you through the initial installation and setup of your new AERO.10 DTV Audio Processor.

It is possible to configure the unit with the front panel controls and display, but doing so by way of the remote client, NfRemote, is much easier and offers a number of benefits.

### 2.2.1. Racking and Power

Use all four rack screws and allow 1RU of space above and below the unit whenever possible. There is an air intake on the right side of the unit and an exhaust fan on the left side that must not be blocked.

Dual, universal power supplies are provided along with two IEC power cables. Ideally, each supply should be fed from a different circuit. In all cases both supplies should be used.

There is no on/off switch, the AERO.10 will turn on when power is applied. The unit may be shut down simply by removing power to it. No harm to the AERO.10 will occur in doing so.

### 2.2.2. Installing NfRemote

The NfRemote client software (remote control) is included on the supplied USB drive. Copy the NfRemote application to a Windows computer or tablet. Double-click to begin the installation and follow the on-screen directions to complete it.

When the NfRemote screen appears, enter the IP address and password of your AERO.10. You may also fill in a “friendly” name in the Comment field to help identify the unit. You may click on the “Add” button to add this unit to a quick recall list in the bottom of the window, or simply click “Connect”.

### ***Note!***

---

A password is required to gain access to the unit’s remote control.  
The default factory password is “**1234**”

---

Once the connection is complete, you will see a similar display to that of the front-panel display. Click the left mouse button to select menu items and controls. To adjust sliding controls, click and hold the left mouse button while dragging the control.

## **2.2.3. Front Panel Operation**

The AERO.10 includes a joystick encoder (menu knob). The operation of the joystick encoder is as follows:

- Push Left = “Escape”, backs you out towards the Main menu
- Push Right = “Enter”, or moves right into the selected submenu
- Push Up = moves up through the menu tree
- Push Down = moves down through the menu tree
- Turn (Rotate) = adjust parameters

When the unit powers up, the front panel will be locked and no configuration changes will be able to be performed without unlocking it. With the front panel locked, it is possible to view the status of

- Hostname (serial number)
- IP address
- System Location
- Software Version installed in the unit.

## **2.2.4. Unlocking the front panel**

- Navigate to the Password field. (The password field is the default field selected when the AERO.10 boots up.)

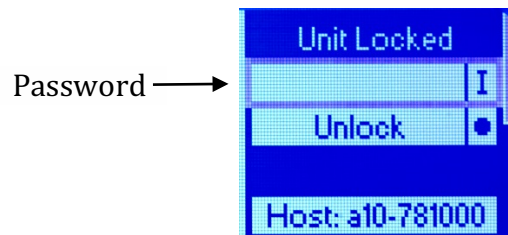


Figure 5: Locked Front Panel Screen

- Press the encoder to the right. A keyboard screen will appear.

**Note!**

A password is required to unlock the unit's front panel control.  
The default factory password is **"1234"**

- Turn the knob left one click to the "123" selection
- Click right (you will see the keyboard change to numbers and symbols)
- Turn the knob left until you get to "1", then click right to accept it
- Continue setting the password to "1234"
- Scroll to "Ok" and click right to accept

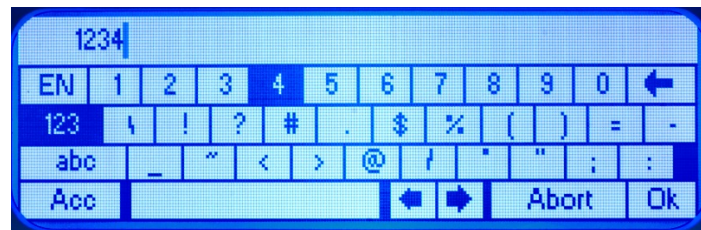


Figure 6: Keyboard Screen

You should now be back at the main screen


- Click down once to highlight the "Unlock" screen (  )
- Click right (the menu will change and "Lock Panel" will appear)



Figure 7: Front Panel Screen after unlocking



The front panel will now be unlocked and settings may be changed.

Please remember to lock the front panel once you are through making adjustments. It will not lock itself unless it is rebooted.

### 2.2.5. Network Configuration

The AERO.10 supports both static IP configuration as well as DHCP. DHCP is the default network setting. It is recommended to assign a static IP address to the AERO.10, especially in larger systems.

The IP address of the unit may be viewed from the front panel of the AERO.10 even without unlocking it. Simply press the encoder down until the IP address is displayed.

**To change the IP configuration from DHCP to a static IP address:**

#### 2.2.5.1. From the front panel:

- Unlock the front panel
- Press the encoder up and select the “System” field, then press it to the right to enter the System menu.
- Press the encoder down to select “Network”, and then press it to the right to enter the Network menu.
- Press the encoder down to select “IP Config”, then press it right to enter the IP Configuration menu.
- Select the “Use DHCP” field, and press the encoder to the right to unselect the DHCP option
- A warning screen will appear. Read the warning.
- Scroll down to “Are you sure?”
- Scroll down to either “No” or “Yes” and press the encoder to the right to accept the one you choose
- Scroll down past the “Apply” field in order to get to the “IP”, “Mask”, “Gateway”, and DNS fields and set those to the desired values
- Press the encoder repeatedly to the left to get back to the “System” display

#### 2.2.5.2. Via NfRemote:

- Launch NfRemote and log in to the AERO.10

- Click on “System”, then “Network Access”, and finally “IP Configuration”

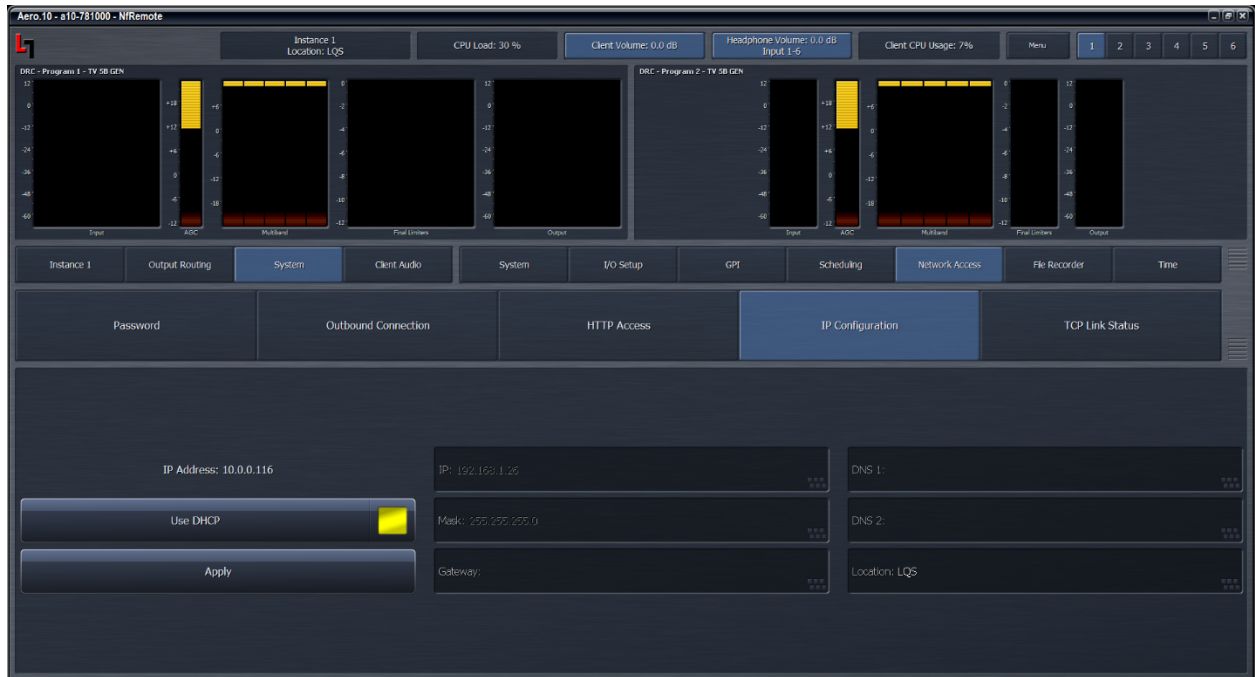


Figure 8: NfRemote IP Configuration Screen

- Click on the “Use DHCP” button.
- Enter the desired “IP” (address), “Mask” (Net Mask), and “Gateway” (address).
- Press the “Apply” button.
- A warning message will appear.

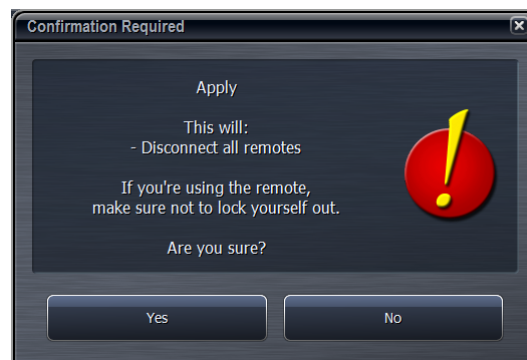


Figure 9: NfRemote Warning Screen

- Make your selection

After selecting “Yes”, the connection to your AERO.10 will be closed, and you will need to log back in to the AERO.10 using the IP address that was just configured.

### 2.2.6. Clock Reference

It is important to properly set the reference clock for the AERO.10 and your system. To select the proper clock reference, navigate to: “System” > “I/O Setup” > “HW I/O”

The clock reference options are:

- Internal 48 KHz
- AES Reference Input
- AES Input 1
- SDI input

#### *Note!*

When SDI Embedding is enabled in the AERO.10, the Clock Reference will be forced to SDI input. Audio Sample Rate Converters are included on the AES inputs in order to provide glitch-free operation with this setting.



Figure 10: NfRemote Hardware I/O Setup

When the reference is locked and valid, the Linear Acoustic logo in the upper left corner will be lit gray. When no valid reference is found, the Linear Acoustic logo in the upper left corner will be blinking red:



## 2.2.7. I/O Configuration

### 2.2.7.1. Input Source Selection:

From the Main Menu, click on “**Instance 1**”, then “**Input**”, and then “**Source**” to navigate to the input source menu. (This type of action will be abbreviated later in this document as “**Instance 1**” > “**Input**” > ...) Each input channel pair of Instance 1 (1/2, 3/4, 5/6, 7/8, 9/10) can be fed from any applied SDI, AES, or Analog source. Choose the appropriate configuration for your plant.



Figure 11: Input Source Selection

A standard 5.1 setup will include Front Left and Right (L/R) on Input 1/2, Center Channel and LFE (C/LFE) on 3/4, and Left Surround and Right Surround (Ls/Rs) 5/6. The remaining channel pairs can be used in a variety of different ways including SAP audio or a separate stereo input.

### 2.2.7.2. Output Routing:

From the Main Menu, navigate to “**Output Routing**” > “**AES/SDI Outputs**” and then to either “**AES Outputs**” or “**SDI Outputs**” depending upon which outputs you plan to use. In either case, select the audio you wish to route to each output pair. Typically, this will mean choosing “Instance 1 Processed 1/2” for the 1/2 output and following suit with the 3/4 and 5/6 pairs, though other options are available as needed. It is also possible to select “Off” to completely mute the output of a channel pair.



Figure 12: Output Routing Menu (SDI)

### 2.2.7.3. SDI Output Routing:

The AERO.10 includes the ability to pass through audio pairs from the SDI input, or to embed audio that has been processed by the AERO.10 or from any source.

To enable or disable embedding, and configure the SDI output stream, navigate to: "System" > "I/O Setup" > "SDI Embedding"



Figure 13: SDI Embedding Menu

### 2.2.8. Setting the Output Level to the Target Level

The factory default processing preset is TV 5B GEN and is suitable for a wide range of program material. It is designed to deliver an average output of -24dB LKFS. If

you find that you need to raise or lower the final output of AERO.10 to achieve -24dBFS (or need to deliver a different average output level completely) navigate to:

"Instance 1" > "DRC Program 1" > "Final"

Adjust the Output Level control accordingly.

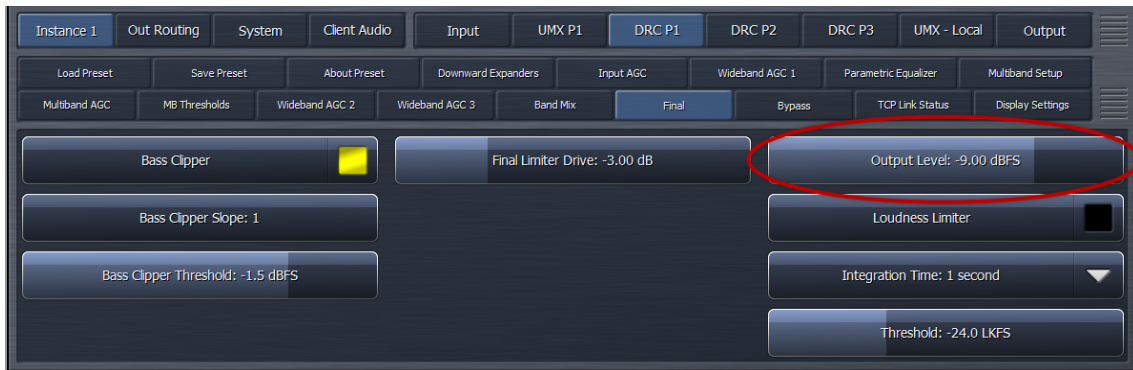


Figure 14: Adjusting Output Level

# Chapter 3: Front Panel Configuration

---

## 3.1. Front Panel Operation

The AERO.10 includes a joystick encoder (menu knob). The operation of the joystick encoder is as follows:

- Press Left = “Escape”, backs you out towards the Main menu
- Press Right = “Enter”, or moves right into the selected submenu
- Press Up = moves up through the menu tree
- Press Down = moves down through the menu tree
- Turn (Rotate) = adjust parameters

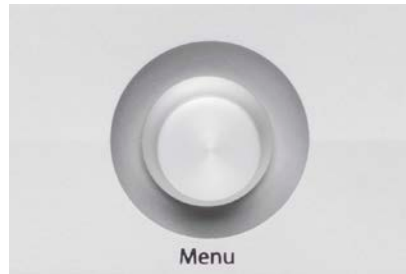


Figure 15: Menu Knob

Pushing the encoder in serves no function and is currently reserved.

In this manual, navigating the front panel will be described using phrases like: “Press the encoder Up/Down to highlight System”. This will be done for the first few examples to help those unfamiliar with the menus and front panel controls. Step by step instructions that walk the user through making a change to a setting are provided

After the first few examples the instructions will be shortened to “**select**” System and this has the same meaning as: Press the encoder Up/Down to highlight the menu selection ‘System’. An instruction to **select** System will almost always be followed by press Right which will then open the selected menu. These step by step instructions will be shortened further later in the manual to:

**Instance 1 > DRC Program 1 > Load Preset > Load a Preset > TV 5B Light.**

This means select Instance 1, press Right, then select DRC Program 1 and Press Right, then select Load Preset and press Right, etc. (It is assumed that the starting

point is always the top level, i.e. the main menu.). This is the 'breadcrumb' style that is seen at the top of the menu window.

### 3.1.1. Front Panel

When the unit powers up, the front panel will be locked and no configuration changes will be able to be performed without unlocking it. With the front panel locked, it is possible to view the status of:

- Hostname (serial number)
- IP address
- System Location
- Software Version installed in the unit.

It is also possible to set the display to a meters only mode without unlocking the front panel.

To scroll through the parameters, simply press the encoder up or down. Pressing the encoder to the right expands the display of the selected field.

### 3.1.2. Unlocking The Front Panel

To unlock the front panel control:

- Navigate to the Password field. (The password field is the default field selected when the AERO.10 boots up.)

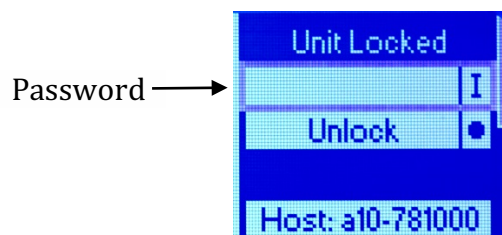


Figure 16: Locked Front Panel Screen

- Press the encoder to the right. A keyboard screen will appear.

#### ***Note!***

---

A password is required to unlock the unit's front panel controls. The default factory password is "1234".



- 
- Turn the knob left one click to the “123” selection
  - Click right (you will see the keyboard change to numbers and symbols)
  - Turn the knob left until you get to “1”, then click right to accept it
  - Continue setting the password to “1234”
  - Scroll to “Ok” and click right to accept

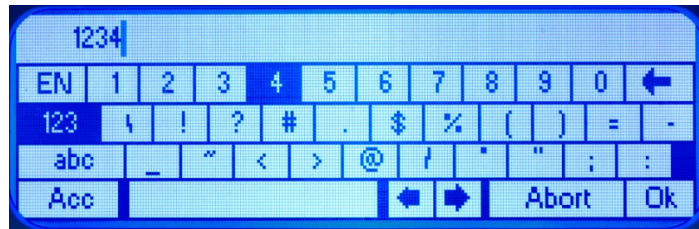


Figure 17: Keyboard Screen

You should now be back at the main screen


- Click down once to highlight the “Unlock” screen (  )
- Click right (the menu will change and “Lock Panel” will appear)



Figure 18: Front Panel Screen after unlocking

The front panel will now be unlocked and settings may be changed.

Please remember to lock the front panel once you are through making adjustments. It will not lock itself unless it is rebooted.

### *Note!*

---

Please remember to lock the front panel once you are through making adjustments. It will not lock itself unless the unit is rebooted.

---

## 3.2. Network Configuration

The AERO.10 is capable of being configured, controlled, and monitored remotely across a standard IP network, either via IP commands or the NfRemote application. In order to control the unit remotely, ensure that the network settings are appropriate for your system is necessary.

Both static IP configuration as well as DHCP are supported in the AERO.10, with DHCP being the default network setting. It is recommended to assign a static IP address to the AERO.10, especially in larger systems.

The IP address of the unit may be viewed from the front panel of the AERO.10 even without unlocking it. Simply press the encoder down until the IP address is displayed.

If the IP address displayed is 127.0.0.1, then the unit is operating without a valid network connection.

### 3.2.1. Changing the IP configuration to a Static IP Address

To change the IP configuration from DHCP to a static IP Address via the front panel controls:

- Unlock the front panel
- Press the encoder up and select the “System” field, then press it to the right to enter the System menu.
- Press the encoder down to select “Network”, and then press it to the right to enter the Network menu.
- Press the encoder down to select “IP Config”, then press it right to enter the IP Configuration menu.
- Select the “Use DHCP” field, and press the encoder to the right to unselect the DHCP option
- A warning screen will appear. Read the warning.
- Scroll down to “Are you sure?”
- Scroll down to either “No” or “Yes” and press the encoder to the right to accept the one you choose
- Scroll down past the “Apply” field in order to get to the “IP”, “Mask”, “Gateway”, and DNS fields and set those to the desired values
- Press the encoder repeatedly to the left to get back to the “System” display

# Chapter 4: Remote / IP Control

---

## 4.1. Overview

The AERO.10 is capable of being remotely configured, monitored, and controlled across an IP network via several different methods.

### **NfRemote**

NfRemote is an application for Windows machines, and is the easiest, and the most convenient, way to control the AERO.10. The NfRemote installation files are on the USB drive that was included with the product, and the current version is on the AERO.10 itself, available for download via the internal HTTP server.

### **HTTP server**

The AERO.10 also includes an internal HTTP server which enables full configuration, control, and monitoring of the unit from a standard web browser (Internet Explorer, Safari, Google Chrome, etc.) or IP commands.

Loudness logging and the logs themselves are accessed via the HTTP server.

#### *Note!*

---

Only computers that have their IP addresses listed in the HTTP Access IP whitelist are able to access the AERO.10 via a web browser or IP commands.

The whitelist may be configured from either the AERO.10's front panel or via NfRemote. Wildcard characters are supported in the whitelist.

---

## 4.2. NfRemote

The NfRemote IP remote interface software is a separate client application that can be downloaded and installed on most recent desktop, laptop, or even tablet PCs which are running Windows XP, Vista, 7, 8, or 10. Touchscreen support is provided for touch-sensitive devices.

All of the AERO.10 front panel parameter adjustments can also be made via the NfRemote client. The remote provides additional capabilities:

- Streaming audio back over the local network to the host computer. Audio can be monitored pre and post processing and at several points internal to the loudness controller.
- Presets (System I/O setup, main upmix, local upmix, loudness control, etc.) can each be saved to the host PC and restored from the host PC.
- The entire AERO.10 configuration can be saved to and restored from the host PC.
- Presets and configurations can be shared between AERO.10 units.
- Six meter configurations, each unique to a given PC, can be saved to the local PC and recalled at the push of a button.
- Multiple NfRemote sessions can be run on a single PC for metering and control of multiple AERO.10 units.
- Multiple PCs can connect to an AERO.10 simultaneously.

Multiple remote sessions on multiple PCs can run simultaneously. This allows monitoring of loudness levels for all program outputs to be displayed in a Master control area and at an engineer's desk at the same time. Configuration and adjustments can be carried out at another PC simultaneously. Multiple units can also be viewed on a single screen.

#### 4.2.1. Installation

There are two ways to get NfRemote. The first one is to load it from the USB flash drive that came with your AERO.10.

The second way is to download it from the AERO.10. If a new version of NfRemote is required after a software update, it will always be available from the AERO.10 itself. Section 4.3.3 describes how to download it from the AERO.10.

##### *Note!*

---

The current version of NfRemote is always available directly from the AERO.10. If a new version of NfRemote is required after a software update, you can download it directly from the AERO.10 using a web browser.

---

This section will explain how to install NfRemote using the included USB flash drive.

Find the NfRemote.exe on the USB flash drive and drag it to either the desktop or a folder of your choosing on your computer. Launch the installer and select **Install** from the menu.

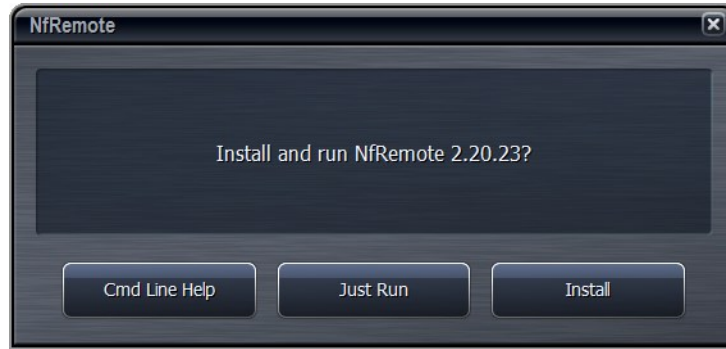


Figure 19: NfRemote Install Screen

#### 4.2.2. Initialization

To begin using NfRemote, connect your PC to the AERO.10, either directly or across a network. If you have just powered up the AERO.10 you will see the unlock screen. The current IP address of the unit is shown on the unlock screen by pressing the encoder down several times. **Note: If the IP address is 127.0.0.1 this indicates that there is not a valid IP connection to the AERO.10.** Make sure that your PC is in the same subnet (but not the same IP address as the AERO.10).

Launch the NfRemote software and enter the AERO.10's IP address and password. The factory password is "1234". You may also fill in a "friendly" name in the Comment field to help identify the unit. Clicking on "Add" will enter that unit's information into memory so that NfRemote remembers the entry.

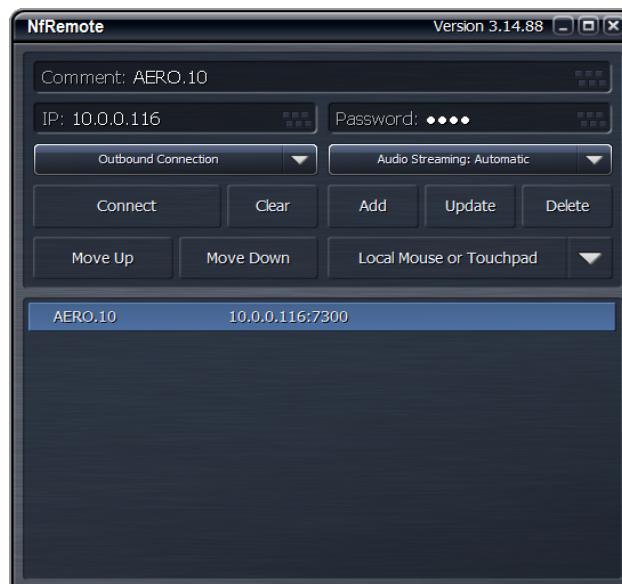


Figure 20: NfRemote Start Screen

### *Note!*

---

The AERO.10 requires a password in order to allow NfRemote to connect to it and unlock the controls. The factory default password is “**1234**”.

---

Some notes about the NfRemote “Start” screen:

- Click once on any entry that has been added to the NfRemote list to load the entry into the Name/IP/Password windows.
- Edit the name, IP address, or password and then press Update to save the change in the stored entry.
- You can also click any entry once and hit the Delete key to delete the entry from the list.
- Double clicking an entry will open an NfRemote connection.
- You can also choose to optimize NfRemote for mouse or touch control. Click on the drop down below the Add/Update/Delete buttons.

Click Connect and the connection screen will be displayed and NfRemote will open.



**Figure 21: NfRemote Connection Screen**

If NfRemote fails to connect, make sure that there is an IP address shown on the unit's front panel lock display. If the front panel is unlocked use the front panel controls and navigate to:

**System > Network Access > IP Configuration**

to read the IP address.

***Note!***

---

If the IP address is 127.0.0.1 this indicates that no valid IP connection is found.

---

Verify that your PC is in the same subnet, has the same subnet mask, but does not have the same IP address as the AERO.10. Ensure that there are no address conflicts in the subnet. If there are still connection problems connect a PC directly to the AERO.10 Ethernet port (not the reserved Ethernet port!). A straight Ethernet cable can be used. Change your PC Ethernet port IP address to something in the same subnet and subnet mask. After establishing a connection this way trouble shoot the network connection.

### **4.2.3. Getting Started Using NfRemote**

After successful connection, the remote starts at the Home Screen. The remote interface screen is fully re-sizeable and can be adjusted in the same manner as any MS Windows application screen, that is, via handles at each corner. The displays and windows will dynamically adjust themselves to make the best use of available screen real estate as you resize the window.

At the top of NfRemote, is the toolbar which includes controls and displays for the AERO.10's CPU load, client volume (streaming audio), headphone volume, and the host PC's CPU load. In some cases, when the display is made smaller, these controls combine and a drop-down arrow appears allowing you to activate individual controls.

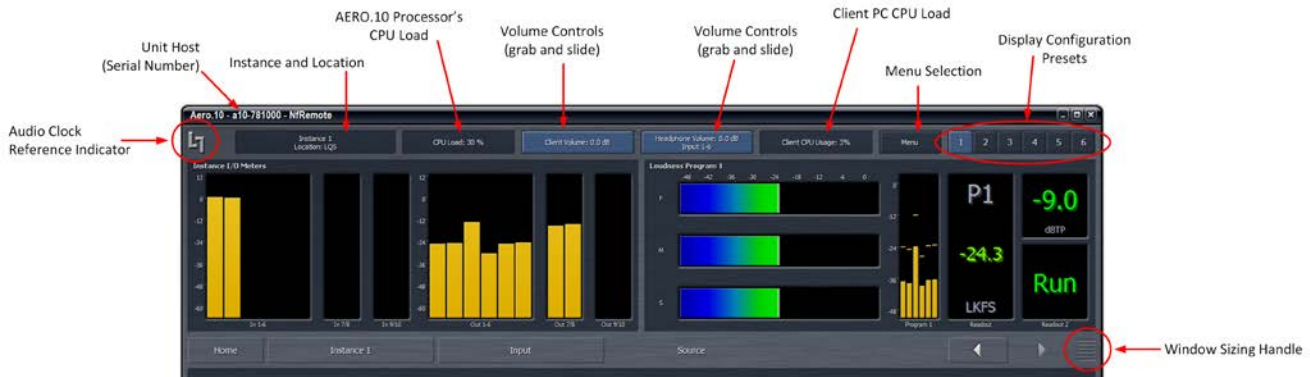


Figure 22: NfRemote Toolbar

### *Note!*

In no case should the AERO.10 CPU load exceed 80% for any length of time. This should be a rare occurrence and may be due to an excessive number of simultaneous NfRemote connections.

## 4.2.4. Tree and Tabbed Navigation

Tree and Tabbed navigation refer ONLY to how information and controls are displayed on the screen, not the number of controls available or their precision.

### 4.2.4.1. Tree Navigation

The default mode is Tree Navigation. Tree navigation works in the same way that front panel navigation works. Each time you click a menu item, it opens the next menu level and so on down through the menus.





Figure 23: NfRemote in Tree Navigation Mode

The top of the screen is always dedicated to meter displays while the bottom is reserved for menus and controls.

In Tree Navigation mode, the area between these two sections displays “Breadcrumbs” indicating where you are in the menu hierarchy.



Figure 24: “Breadcrumbs” which are shown in Tree Navigation Mode

The on-screen arrows in the right side of the Breadcrumb line can be clicked to navigate between the most recently visited controls.

The “ribbed” section of the display, to the far right of the arrows, allows the top and bottom sections to be resized. Place your pointer in the ribbed area and left click to change the relative sizes of the meters and controls.

#### 4.2.4.2. Tabbed Navigation

In the Tabbed mode, all menus and all controls are displayed on the screen simultaneously, and you have direct access to all menu items and associated

controls without having to step through the menu structure in sequence. Since this mode inherently makes menus, controls, and their labels smaller, this mode works best when the remote software window can be made large enough so that all text items can be easily read.

The figure below shows the same menu location as shown above in Figure 23: NfRemote in Tree Navigation Mode, but only in Tabbed view.



Figure 25: NfRemote Tabbed Navigation View

Notice that you can see all of the sub-menus of **Instance 1** (top row, right side), all of the sub-menus of **Input** in the center section, and all of the available selections under **Source** embedding in the bottom section. There are two size adjustments in Tabbed view. One adjusts the meter vs menu item size and the other the relative sizes of the center and lowest section of the menus.

#### 4.2.5. Display Configuration

Clicking on the **Menu** button, located in the Toolbar at the top of the display, will allow you to select Tree or Tabbed navigation, full screen meter display, lock the window's onscreen position, maximize the window, enter full screen mode, or close the window.

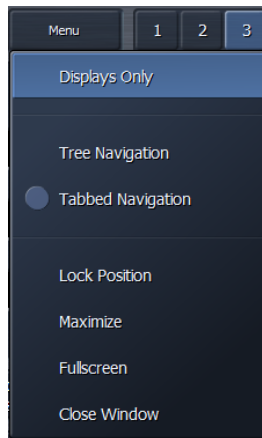


Figure 26: NfRemote Menu Window

When the display is in meters only mode, place the mouse in any meter window and left click to return to the NfRemote configuration screen.

#### 4.2.6. Configuring Meter Displays

To the right of the **Menu** button are six Meter Display Presets that quickly recall display configurations. Simply select a display preset from 1 to 6 and configure the display settings.



Figure 27: Meter Display Presets

NfRemote first starts with Display Preset 1 active. Any changes made to the screen (choosing the number and type of meters displayed, and resizing window sections) are automatically saved in real time. Switching back to this preset from any other automatically recalls your saved settings. Each Display Preset setting is saved on the local PC. This allows every PC that connects to the AERO.10 to have its own unique metering configurations instantly available.

Although up to eight meters can be shown on the NfRemote screen at once, each additional meter takes away screen space from the others. Depending on your monitor size you may find it practical to limit the number of meters on any one screen. Display presets can be used to quickly switch between different meter selections. Display presets can also be used to create full screen meter displays. More meters can be used for full screen view than are practical when the menus are visible.

You can click on a meter to go directly to the display setup page and specific settings for that meter at any time.

To setup Meter Display preset 1 start by clicking display preset **1** (next to Menu button) then click on:

1. **Instance 1 > Input > Display Settings**
2. **Display 1 > Common > Hardware I/O**
3. **Display 2 > Program 1 > DRC-Program 1**
4. **Display 3 > Program 1 > Loudness Program 1**



Figure 28: Meter Display Preset 1 Configuration Example

Click display preset **2** and then click:

1. **Display 1 > Program 2 > DRC-Program 2**

2. **Display 2 > Program 2 > Loudness Program 2**
3. **Display 3 > Program 3 > DRC- Local**
4. **Display 4 > Program 3 > Loudness 3**

Click display preset **3** and then click:

1. **Display 1 > Program 1 > Loudness Program 1**
2. **Display 2 > Program 1 > Graph Program 1**
3. **Display 3 > Program 2 > Loudness Program 2**
4. **Display 4 > Program 2 > Graph Program 2**
5. **Display 5 > Program Local > Loudness Local**
6. **Display 6 > Program Local > Graph Local**

To turn a display on off click on **Display Settings**, select any display and select **Off** from the menu.

To aid in setting up the DRCs (loudness controllers) and also to evaluate content pre and post processing there are several audio analyzers available in the Display settings menus:

For each Pgm there are meters for:

- DRC activity
- Loudness Meter \*
- Loudness Graph
- EBU Loudness Range.

\* ITU Loudness Meter is used unless the EBU R128 meter option is installed.  
True Peak readings are shown on each Loudness meter.

Common meters include:

- Instance I/O
- Hardware I/O
- Oscilloscope
- RTA
- FFT
- Client Audio Meters

The Oscilloscope, RTA, and FFT are valuable monitoring and diagnostic tools that can measure and display signals from myriad patch points within AERO.10. Extensive setup controls are provided for these meter types.



Figure 29: RTA Meter Configuration Panel

#### 4.2.7. Configuring Loudness Meters

ITU-BS.1770-3 loudness meters for each output are provided. Measurements can be made in ITU mode, for ATSC A/85 based measurements, or optionally as EBU R128 type measurements. The EBU option may be requested when ordered or installed in the field with a software key. ITU or EBU mode is a global setting for all loudness meters in an AERO.10

When the EBU R-128 based metering option is installed, the metering reference level is fixed at -23 LUFS and the loudness bar graph meters are fixed at R128 recommended integration times. The digital loudness meter is an integrated meter with reset control.

When using the standard ITU Loudness metering, the integration time of the bar graph loudness meters, the digital readout meter and the LKFS meter reference level are all selectable.

The loudness meter configuration controls are located in:

**Instance 1 > Output > Loudness Meter**



**Figure 30: Loudness Meter Configuration Panel**

The integration time of the 3 bar graph meters can be chosen as well as the integration time of the digital readout. The integration of the digital readout can also be manually controlled to measure specific programs or over specific time periods.

### *Note!*

The Loudness Meter settings available here do not affect the Loudness logs.

## **4.3. HTTP Server**

The AERO.10 includes an internal HTTP server, and is capable of being controlled via this interface, either from a common web browser or via scripting commands. Some functions, such as downloading the loudness measurement logs are only available from the HTTP server interface.



### 4.3.1. HTTP Access IP Whitelist

Only computers which are included in a “whitelist” are able to connect to the AERO.10’s HTTP server. This prevents unauthorized users from accessing this feature of the AERO.10 and potentially disrupting or disturbing the on-air signals.

#### *Note!*

Only computers which are included in a “whitelist” are able to connect to the AERO.10’s HTTP server. Wildcard characters are supported in the Whitelist, which easily enables a range of addresses to be included.

The Whitelist may be configured either from the AERO.10’s front panel or via NfRemote.

**To configure the whitelist:**

#### 4.3.1.1. Front Panel

Unlock the front panel as described in section 2.2.4. Then navigate to:

**System > Network > HTTP > IP/mask**

Scroll down and enter the IP address of the desired computer to have access the HTTP functions of the AERO.10

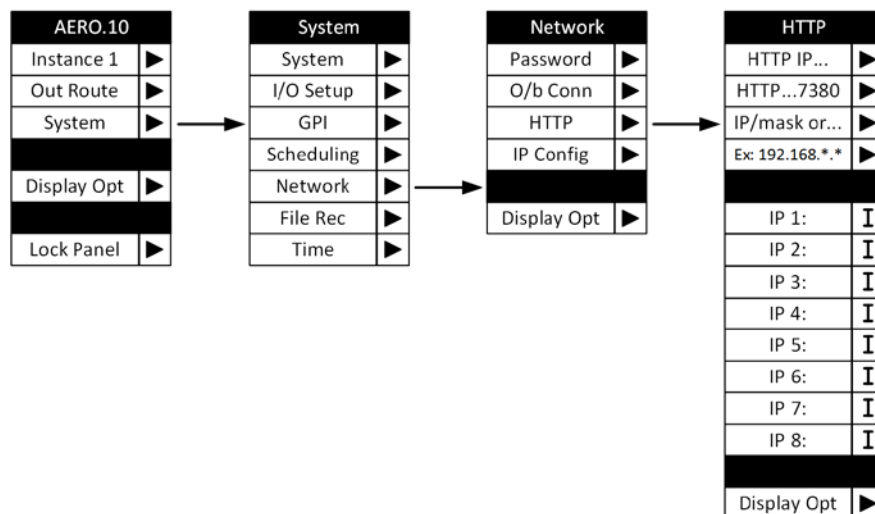


Figure 31: Front Panel Navigation to Configure IP settings



- Click down to access the IP address slot desired.
- Click right to access the keyboard window
- Enter the desired IP address (clicking right at each digit and period to “take” the change)
- Scroll over to “Ok” when finished
- Click right to enter the IP address.

#### 4.3.1.2. NfRemote

To configure the Whitelist using NfRemote, navigate to:

**System > Network Access > HTTP Access**



Figure 32: NfRemote Whitelist Configuration Panel

Since wildcard characters are supported, in the example above, all computers with an IP address of 10.0.0.xxx are able to access the AERO.10’s HTTP server.

#### 4.3.2. Accessing the HTTP homepage

The unit’s HTTP server uses port 7380. To gain access to the unit’s HTTP server home page, open up a web browser such as Internet Explorer, Apple Safari, Google Chrome, etc., and navigate to the unit’s IP address adding “:7380” at the end to specify the port.

**Example:** For this example, the AERO.10 is configured to have an IP address of 192.168.0.50. To open the AERO.10's home page, enter an address of:

<http://192.168.0.50:7380>

in your web browser.

Once the connection is made, a screen similar to this one should appear:

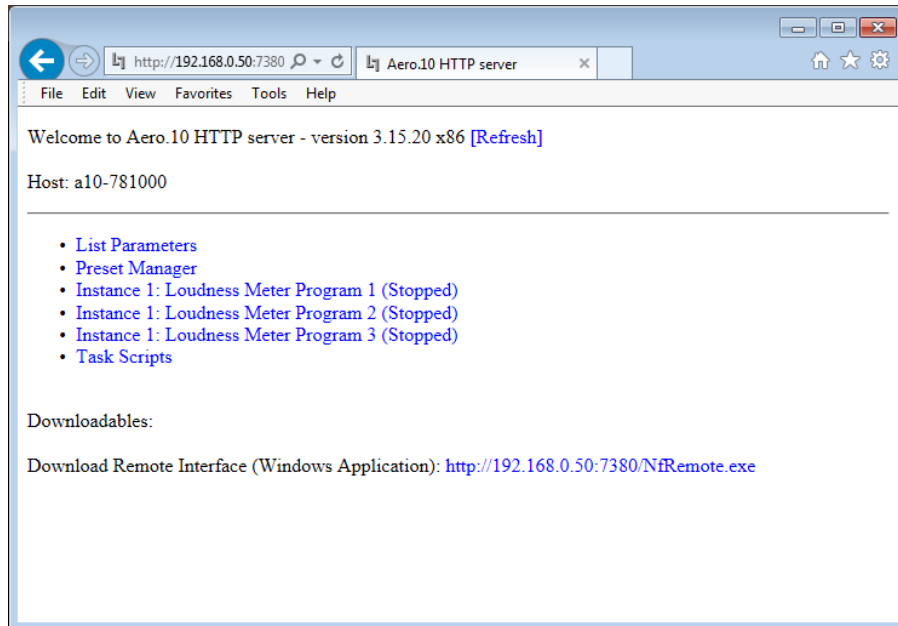


Figure 33: AERO.10 HTTP Home Page

If the host computer is not included in the AERO.10's whitelist, an error message similar to the one below will appear (only with the actual IP address of the host computer referenced instead of 192.168.0.10):



Figure 34: Error Message For Computers Not On Whitelist

### 4.3.3. Downloading NfRemote

To download NfRemote from the AERO.10, simply click on the hyperlink which lists the IP address of the unit followed by “/NfRemote.exe”, as shown below:



Figure 35: Link to Download NfRemote

Then save to your local machine. After saving NfRemote to your computer, install it as described in section 4.2.1.

### 4.3.4. Loudness Measurement Logs

The AERO.10 generates logs of the loudness measurements at each of the 3 program outputs.

Loudness logs are available individually for:

- User Log
- Past 24 hours
- Past 48 hours
- Past 7 days
- Past 70 minutes – high resolution

The user controlled log may be started, stopped, and reset from the web browser or NfRemote.

Loudness measurement data is recorded and entered into the log file once per second, with the exception of the High Resolution log file which records data every 400 ms.

#### *Note!*

---

Loudness regulations and tools such as loudness control, loudness measurement, and loudness logs are intended to match the **average** loudness level across an entire piece of content (program, advertisement, etc.)

It is perfectly acceptable to have loudness levels vary over the course of a program, maintaining intended “creative” dynamics that the producer included into the audio mix. In fact, the resulting audio will sound far more natural than if the loudness measurement was to remain perfectly constant.

---

The information that is recorded in the Loudness Measurement Log is as follows:

Every entry:

- Timestamp (real time)
- 3 second integration time measurement
- 10 second integration time measurement
- 30 second integration time measurement
- TruePeak measurement
- Loudness target value
- Audio channel configuration (acmod)

Summary Information:

- ITU BS.1770 Integrated Ungated
- ITU BS.1770-2 Integrated Gated
- EBU R128 Integrated Ungated
- EBU R128 Integrated Gated
- Maximum True Peak Measurement
- EBU R128 Loudness Range, including Low, Median, High, and Range values

To get to the loudness log, click on the “[Instance 1: Loudness Meter Program](#)” of your choosing. The following window will appear:

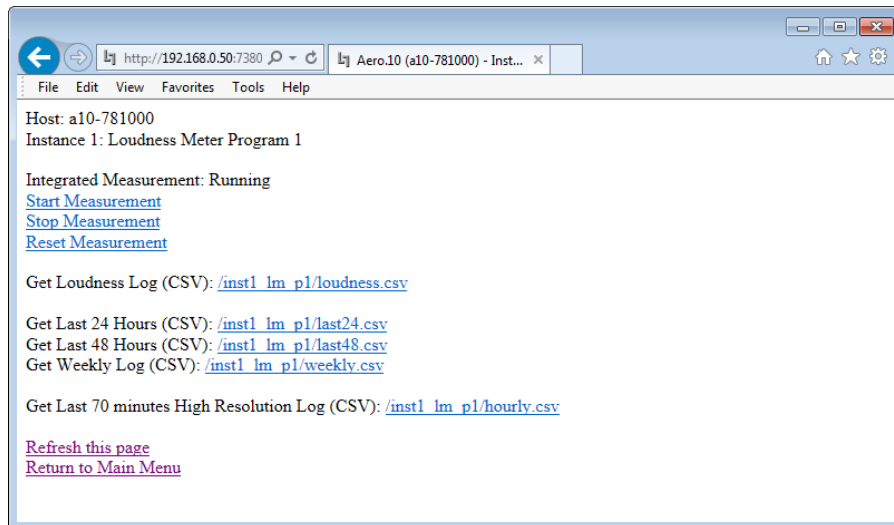


Figure 36: Links To Loudness Logs

To view the loudness measurement log click on the hyperlink provided for the loudness measurement log that is desired. The loudness log will be displayed be on screen.

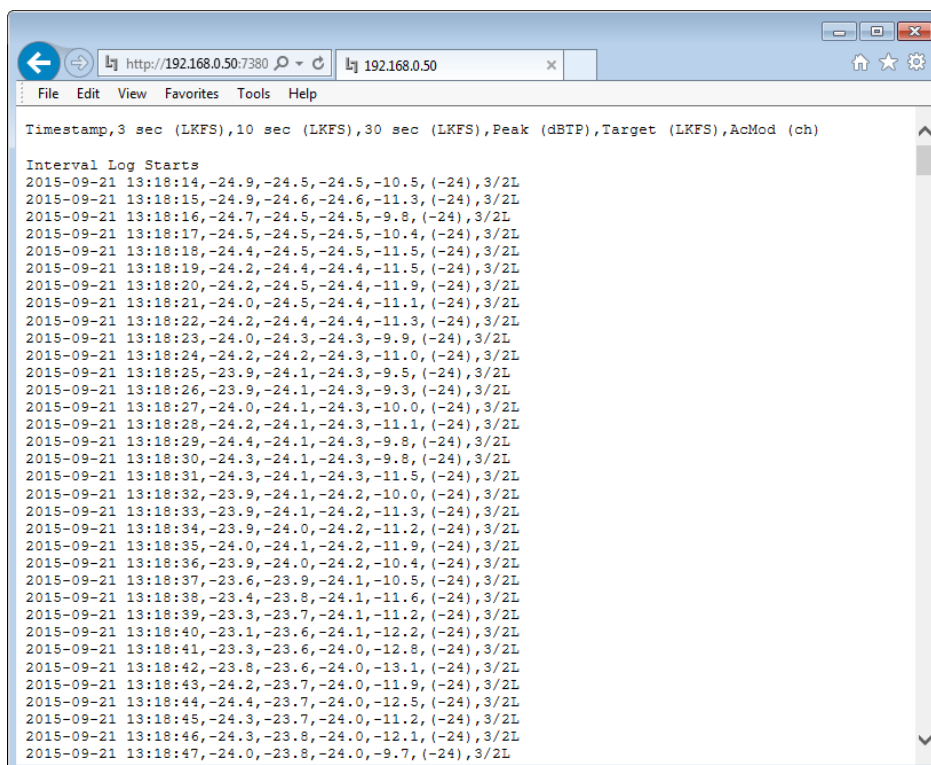


Figure 37: Loudness Log - Webpage View

#### 4.3.4.1. Downloading the Loudness Logs

It is often useful to download the loudness log and save it as a file. Loudness logs are able to be downloaded as a comma separated value text file (\*.csv) file, which may be opened in applications such as Microsoft Excel.

To download a loudness log (with Internet Explorer):

Right click on the log file hyperlink, then save as (desired filename).csv

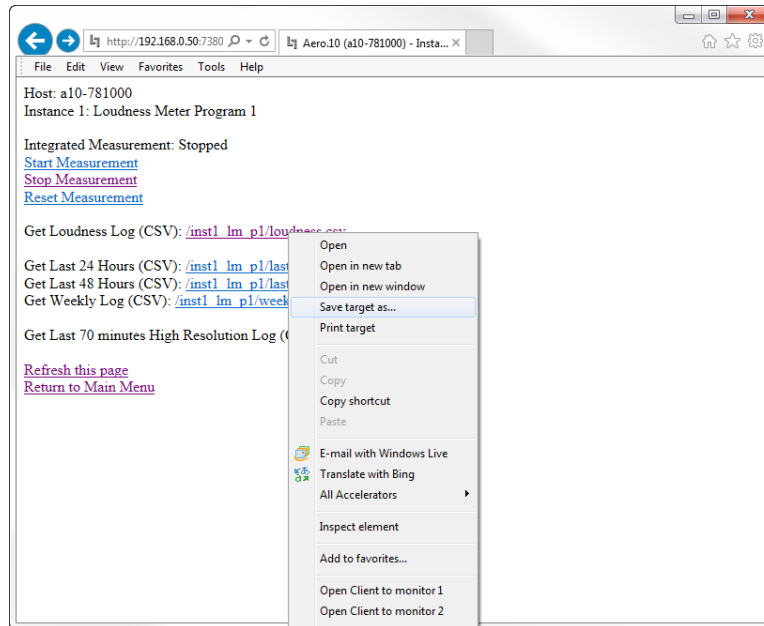


Figure 38: Downloading Loudness Logs

Once the \*.csv file is downloaded, the data may be searched, sorted, filtered, and formatted as necessary.

	A	B	C	D	E	F	G
1	Timestamp	3 sec (LKFS)	10 sec (LKFS)	30 sec (LKFS)	Peak (dBTP)	Target (LKFS)	AcMod (ch)
2							
3	Interval Log Starts						
4	9/21/2015 13:18	-24.9	-24.5	-24.5	-10.5	(-24)	3/2L
5	9/21/2015 13:18	-24.9	-24.6	-24.6	-11.3	(-24)	3/2L
6	9/21/2015 13:18	-24.7	-24.5	-24.5	-9.8	(-24)	3/2L
7	9/21/2015 13:18	-24.5	-24.5	-24.5	-10.4	(-24)	3/2L
8	9/21/2015 13:18	-24.4	-24.5	-24.5	-11.5	(-24)	3/2L
9							
10	9/21/2015 13:29	-23.8	-23.8	-23.7	-11.8	(-24)	3/2L
11	9/21/2015 13:29	-23.5	-23.7	-23.7	-11.2	(-24)	3/2L
12	9/21/2015 13:29	-23.2	-23.7	-23.7	-11.2	(-24)	3/2L
13	Interval Log Ends						
14							
15	ITU BS.1770 Integrated Ungated: -23.9 (LKFS)						
16	ITU BS.1770-2 Integrated Gated: -23.9 (LKFS)						
17	EBU R128 Integrated: -0.9 (LU)						
18	EBU R128 Integrated: -0.9 (LU)						
19							
20	Maximum Peak: -9.0 dBTP						
21							
22	EBU R128 Loudness Range:						
23							
24	Low	-1.7 LU					
25	Median	-0.9 LU					
26	High	0.1 LU					
27	Range	1.8 LU					

**Figure 39: Loudness Log Opened In Microsoft Excel**

# Chapter 5: Important Setup Parameters

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## 5.1. Important Setup Parameters

The AERO.10 includes some key parameters which are critical to get set correctly. This chapter discusses some of them, but is not an exhaustive list of settings and parameters.

These parameters may be configured either from the Front Panel control or via NfRemote. For speed and ease of configuration, setting these parameters via NfRemote will be explained in this chapter. The parameters being adjusted will be found in consistent locations in the menu tree whether they are being accessed from the Front Panel or via NfRemote (i.e. **Clock Reference** will be found in **System** > **I/O Setup** > **H/W I/O Setup** in both the Front Panel menu and in NfRemote)

## 5.2. Unit Configuration Setup Parameters

### 5.2.1. Password

A password must ALWAYS be set in the AERO.10. The factory set password is 1234. If you choose to change the password keep it in a safe place. If the password is lost or removed the unit must be sent back to the factory to recover front panel and remote control of the unit.

To change the password:

**System** > **Network** > **Password**

Make sure you save your new password somewhere safe!!

#### *Note!*

---

The factory set password is **1234**. If you change the password, keep it in a safe place. If the password is lost or removed, the unit must be returned to the factory.

---



### 5.2.2. Time Zone

Set the Time zone properly. Changing this setting requires a reboot to the AERO.10, so it is recommended to set this early during the configuration process.

**System > Time > Time Zone**

Set Time Zone and select Yes (in pop-up) to reboot.

### 5.2.3. Time

To adjust the System Time manually

**System > Time > Set Clock Manually**

Adjust the time and date sliders, then press **Apply Time** and **Apply Date** to apply the changes.

### 5.2.4. Network Time Protocol (NTP) Reference

If NTP reference is desired to be used, navigate to:

**System > Time > NTP**

- Ensure that **NTP Synchronization** is disabled (the indicator will be black).
- Click on **NTP Synchronization** if necessary to disable it.
- Enter NTP server address(es).
- Enable **NTP Synchronization**.

### 5.2.5. Clock Reference

The AERO.10 can be referenced to:

- Internal 48 kHz
- SDI
- AES In 1
- AES DARS (or any AES signal applied to the Ref In connector)

*Note!*

---

If SDI embedding is enabled, clock reference will be forced to SDI automatically. Otherwise, proper reference MUST be selected for glitch-free operation!

---

To set the audio clock reference, navigate to:

**System > I/O Setup > H/W I/O Setup**

### 5.2.6. Input Source

To set the input audio sources for the main program (Program 1), the 7/8 input (Program 2), and the 9/10 input (Program 3), navigate to:

**Instance 1 > Input > Source**

When Program 1 is a 5.1-channel program,  
Input 1/2 = Left / Right input (front)  
Input 3/4 = Center / LFE  
Input 5/6 = Left Surround / Right Surround

AES, SDI, and Analog inputs are always available to choose from.

### 5.2.7. Sample Rate Converter (SRC) Bypass

Sample Rate Converters are included on the AES inputs. This allows for asynchronous audio to be input, processed, and output without any glitches. The SRCs are enabled by default. To bypass the SRCs, which should only be considered if the AES input audio is synchronous with the Clock Reference, navigate to:

**System > I/O Setup > SRC Bypass**

### 5.2.8. Mute Input 3-6

When the source audio for DRC 1 will always be stereo, it should be routed to Input 1/2. Mute Input 3-6 can be used to ensure that any audio on Inputs 3/4 and 5/6 is never interpreted as multichannel or surround content.

To mute Inputs 3-6, navigate to:

**Instance 1 > Input > Main Input**

### **5.2.9. Output Routing (AES)**

Select the DRC outputs that will be output via each AES digital output. Navigate to:

**Output Routing > Main Outputs > AES Outputs**

### **5.2.10. Output Routing (SDI)**

Select the DRC outputs that will be made available for embedding into the SDI output stream. Navigate to:

**Output Routing > Main Outputs > SDI Outputs**

### **5.2.11. SDI Embedding**

SDI Embedding is where the construction of the final output SDI stream is determined. The user has the option to:

- Pass through the matching pair from the input SDI stream
- Pair shuffle from the input SDI stream
- Embed the processed audio specified in the Output Routing (SDI) section above
- Embed audio from an AES or Analog input source
- Mute the output pair

To access the SDI Embedding control panel, navigate to:

**System > I/O Setup > SDI Embedding**

#### ***Note!***

---

If SDI embedding is enabled, clock reference will automatically be forced to SDI.

## 5.3. Audio Processing Setup

These audio settings are grouped looking from left to right in the **Instance 1** toolbar (when NfRemote is in Tabbed Navigation mode)

Input Source selection and configuration is described above in sections 5.2.6, 5.2.7, and 5.2.8. Similarly, Output Routing and configuration are described in sections 5.2.9, and 5.2.10.

### 5.3.1. UPMAX II Upmixing

When configured with a 5.1+2+2 instance, UPMAX II 2-channel to 5.1-channel upmixing is available for both the main program (Program 1) and the Local Input (Inputs 9/10) independently.

To configure the upmix settings for Program 1, navigate to:

**Instance 1 > UPMAX II Program 1 > Main Settings**

Ensure that Power is enabled, and that Upmix Enable is active.

If a mix of multichannel and 2-channel input streams is expected and a constant multichannel output is desired, enable Auto Mode.

To adjust the upmixer parameters, navigate to:

**Instance 1 > UPMAX II Program 1 > Adjust**

To adjust the transition times from discrete multichannel to upmixed, and upmixed audio to discrete multichannel, navigate to:

**Instance 1 > UPMAX II Program 1 > Transitions**

To adjust the Auto Mode settings, navigate to:

**Instance 1 > UPMAX II Program 1 > Auto Mode Settings**

The UPMAX II processor for the Local Input includes the same upmix engine and controls, but does not include the Auto Mode (or any related controls) because the input source is always constrained to be a 2-channel source.

### 5.3.2. DRC Program 1

To quickly set the DRC for Program 1 (Main Program), navigate to:

**Instance 1 > DRC - Program 1 > Load Preset**

Select and load a loudness control preset.

**Instance 1 > DRC - Program 1 > Final**

Adjust **Output Level** so that the average loudness value on the Program 1 loudness meter is on target. (Typically -24 dB LKFS or -23 dB LUFS)

### 5.3.3. DRC Program 2 and DRC Program 3

These are set similarly to DRC Program 1, listed above.

### 5.3.4. Video Delay

Video delay of up to one full second (1000 ms) is included in order to maintain A/V sync through the SDI I/O. To adjust the video compensating delay, navigate to:

**System > I/O Setup > SDI Video Delay**

Simply grab the slider bar and move it to the desired delay setting.

### 5.3.5. Audio Delay

Similarly, Audio delay of up to 680 ms of audio delay is available at \*each\* audio output pair in order to maintain A/V Sync, or audio to audio sync through the AERO.10. To adjust the audio compensating delay, navigate to:

**Instance 1 > Output > Output Delay**

Simply grab the slider bar and move it to the desired delay setting.

# Chapter 6: Specifications

## 6.1. Physical

Mechanical	
Dimensions	1.75"H x 19"W x 13.25"D (4.5 x 48.3 x 34 cm)
Weight	12.5 lbs (6 kg)
Environmental	
Operating	0 – 50 degrees C
Non-operating	-20 – 70 degrees C
Cooling	Fan cooled
User Interface	
Display	240 x 64 dot matrix, single color LCD display
Control	Single joystick/rotary encoder. Capable of being pressed up, down, left, right, in, and being rotated left and right.

## 6.2. Electrical

Power	
Power Requirements	Dual, redundant, universal power supplies included. Unit rated at 100 – 240 VAC, 50 – 60 Hz, 100 W maximum, 38 W typical.
Power Cords	IEC power cords match country of delivery
Processing	
Structure (specified at time of order)	5.1+2+2 (local/voiceover/EAS input), with downmix output and dual-path upmixing
	2+2+2 (local/voiceover/EAS input)
Algorithms	<b>AEROMAX®</b> : ITU-R compliant loudness control via fully adjustable wideband and multiband processing <b>UPMAX® II</b> : 5.1-channel upmixing, automatic bypass of discrete content <b>AutoMAX</b> : automatic detection and switching of native multichannel and 2-channel content which has been upmixed.
Latency	
1-6 In to 1-6 Out	64 ms (upmix disabled, SRC enabled)
	75 ms (upmix enabled, SRC enabled)
7/8 In to 7/8 Out	64 ms

Lo/Ro downmix to 7/8	64 ms (upmix disabled, SRC enabled)
	75 ms (upmix enabled, SRC enabled)
Lt/Rt downmix to 7/8	88 ms (upmix disabled, SRC enabled)
	98 ms (upmix enabled, SRC enabled)
9/10 In to 9/10 Out	64 ms
Lo/Ro downmix to 9/10	64 ms (upmix disabled, SRC enabled)
	75 ms (upmix enabled, SRC enabled)
Lt/Rt downmix to 9/10	88 ms (upmix disabled, SRC enabled)
	98 ms (upmix enabled, SRC enabled)
<b>Headphone Output</b>	
Frequency Response	20 Hz–20 kHz, $\pm 1$ dB (Protection Limit preset)
Level	+12 dBu maximum
Connector	1/4-in (6.35-mm) front panel jack with volume control
<b>Analog I/O</b>	
Input	2-ch, balanced, +4 dBu nominal, 10 k $\Omega$
Output	2-ch, balanced, +4 dBu nominal, +24dBu maximum into 600 Ohms
Connector	DB9 connector
<b>Digital I/O</b>	
HD/SD-SDI Auto-Sensing I/O	Connections are unbalanced, 75- $\Omega$ , with internal termination via BNC-F connectors De-embed up to 16 audio channels from SDI, monitor/measure and re-embed up to 16 channels. Signal levels per SMPTE 292M /259M Supports up to 1080i/60/59.94/50 Hz
Digital Audio I/O	Connections are unbalanced, 75- $\Omega$ , with internal termination via BNC-F connectors Signal levels per SMPTE 276M/ AES-3ID-2001
Remote	TCP/IP remote control and audio monitoring via Remote Interface software, a Windows®-compatible application (included) HTTP server allows get/set control from any OS
Ethernet	100 to 1000 BASE-T via RJ-45 connector
GPI/O Parallel Control Port	DB25-F connector, 0–5 V TTL levels
USB	USB Type A connection for system updates and loudness log transfer.



### 6.3. Audio

Audio	
Format	PCM
Sample Rate	48 KHz
Bit depth	Up through 24 bits

### 6.4. Other

Warranty	
	Linear Acoustic 2-year warranty.
Regulatory	
North America	Designed to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC rules (CFR). Power supplies are UL tested and approved.
Europe	Designed to comply with the limits of harmonised Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC as indicated by the affixed CE marking; RoHS and WEEE compliant.

# Appendix A: AEROMAX DRC Presets

---

## Fine Arts 5B Gen

Fine Arts 5-Band General offers medium processing appropriate for artistic programming that may have large dynamic range variations. It produces consistent loudness and spectral balance.

## ITU 5B Loudness Lim

ITU 5-Band Loudness Limit utilizes a specially tuned Multiband AGC Limiter and the Final Limiter to slowly adjust the average program loudness to a specific loudness value as measured over time. The Multiband Limiters and Final Limiters act until the very slowly responding wideband AGC catches up. The multiband AGC is bypassed (1:1) so spectral balance is unaffected. This preset can be appropriate for ingest, live, or network transmission applications where content is pre-normalized.

## Music 5B Hvy

Music 5-Band Heavy is an aggressive preset for TV music channels that effectively delivers music programming to small televisions and portable receivers.

## MVPD 5B Gen

MVPD 5B Gen is intended for Multiple Video Program Distributors who may not have full control of all programs, interstitials or commercials present in a given network stream. It applies medium-light multiband processing, sets Gate and Freeze to prevent background noise pull-up, and is tuned for all genres.

## Net 5B Limit

Net 5B Limit applies a final polish to an already consistent network program prior to distribution. A combination of TV 5B Light and ITU 5B Loudness Limit, this preset has a very slow input AGC, and a lighter multiband AGC. It preserves microdynamics

and pulls the low-level information up slightly while protecting against long-term loudness shifts.

## **Protection Limit**

Protection Limit sets all processing to unity gain and leaves only look-ahead peak limiters in the signal path. The master output level is set to 0 dB, so applied signals get a unity gain path through the processor.

## **Reference Settings**

This preset offers standard processing test settings that match TV 5B Gen.

## **Sports 5B Gen**

Sports 5-Band General provides medium processing that features quick response with minimal background pumping. It keeps dialogue present and audible, even in rich surround mixes.

## **TV 4B Gen**

Television 4-Band General is essentially the same as TV 5B Gen (below) with four audio bands. This keeps all other settings the same, lessens the density and impact on dialogue, and results in more open sounding audio, albeit with less short-term dynamic loudness control.

## **TV 5B Gen (Default)**

Television 5-Band General is the factory default preset and also the most commonly used. It provides moderate dynamic range processing, and is appropriate for all content types.

## **TV 5B Hvy**

Although Television 5-Band Heavy is similar to TV 5B Gen, its multiband compression ratio is higher, which creates a denser but less dynamic sound useful for systems with smaller speakers.

### **TV 5B Light**

Although Television 5-Band Light is similar to TV 5B Gen, its multiband compression ratio is lower (2:1) for more subtle action. This is an excellent preset for content known to be consistent that needs just a bit of spectral polish. Note that this preset allows more variations without correction, but for already consistent content, this is not an issue.

### **TV 5B Loud**

Television 5-Band Loud is similar to TV 5B Hvy, but louder and punchier.

# Appendix B: Connector Pinout

---

## Analog I/O

Two-channel analog I/O is provided via a DB9 connector. The audio is balanced with a +4 dBu nominal level.

The pin definition of the connector is as follows:

Pin	Function
1	In Left +
2	In Right +
3	Out Left +
4	Out Right +
5	GND / Shield
6	In Left -
7	In Right -
8	Out Left -
9	Out Right -

The location of the pins in the connector is as follows:

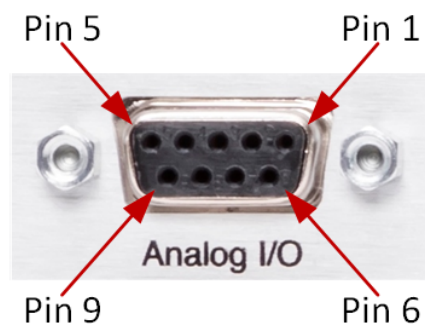


Figure 40: Analog I/O Connector Pinout - Rear Panel View

## GPI/O

General Purpose I/O (GPI/O) control pins are provided via a DB25 connector. 8 GPI functions are supported. GPO functions are not currently supported.

The pin definition of the connector for wiring harnesses is as follows:

Pin	Function	Pin	Function
1	+5 V, 150 mA	14	+5 V, 150 mA
2	GPI A (Active Low)	15	GPO A (currently unused)
3	GPI B (Active Low)	16	GPO B (currently unused)
4	GPI C (Active Low)	17	GPO C (currently unused)
5	GPI D (Active Low)	18	GPO D (currently unused)
6	GPI E (Active Low)	19	GPO E (currently unused)
7	GPI F (Active Low)	20	GPO F (currently unused)
8	GPI G (Active Low)	21	GPO G (currently unused)
9	GPI H (Active Low)	22	GPO H (currently unused)
10	No Connection	23	Ground
11	Status OK	24	No Connection
12	No Connection	25	Ground
13	Ground		

The location of the pins in the connector is as follows:



Figure 41: GPI/O Connector Pinout - Rear Panel View