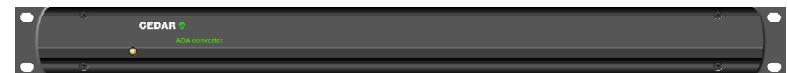


**CEDAR** 



**ADA converter**

OWNER'S MANUAL

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Manual version 1.02: February 2003

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## SAFETY INSTRUCTIONS

**Failure to adhere to the safety instructions may cause severe damage to the ADA and risk of electric shock.**

n **Unpacking**

Unpack the ADA carefully. Save the packing materials since you may need them to transport the unit in the future. In addition to this manual, the ADA and its packaging, the box should contain a mains lead, rubber feet, rackmounting accessories and a warranty registration card.

n **Water and moisture**

The ADA must not be exposed to rain or moisture. If the ADA is brought directly from a cold environment into a warm one, moisture may condense inside it. Always allow the ADA to reach ambient temperatures naturally before connecting the mains power.

n **Installation site**

To maintain reliability and prolong operating life, observe the following environmental considerations:

- n the temperature should be maintained between 5 and 30 Celsius
- n relative humidity should be in the range 30% to 80% non-condensing
- n strong magnetic fields should not exist nearby.

Do not subject the ADA to strong sunlight, excessive dust, mechanical vibration or periodic shocks. The unit is not susceptible to excessive heat build-up, but should be installed away from heat sources such as radiators and audio devices that produce large amounts of heat.

n **Mains voltage and Earthing (Grounding)**

Before connecting to mains power, ensure that (i) the voltage selector is set to the correct voltage for the local mains supply, and that (ii) the fuse is of the correct rating, as indicated on the rear panel of the ADA. The unit must be earthed to ensure a safe operating environment and to provide electromagnetic shielding.

n **Connections**

Turn off the power to all equipment before making any connections.

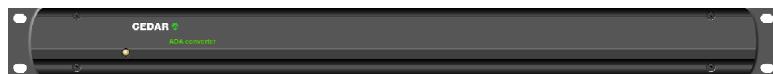
n **Cleaning**

Clean the ADA only with a dry cloth. Never use abrasive pads or liquid cleaners such as alcohol or benzene.

n **Damage requiring service**

The ADA contains no user-serviceable parts and should not be opened by unauthorised personnel. It should be returned to qualified service agents when it has been exposed to liquids, when it fails to function correctly, when it has been dropped, or when the case is damaged.

## INTRODUCTION



The CEDAR ADA A/D and D/A Converter is a 24-bit, 96kHz 1U rackmount unit that produces an AES/EBU or SPDIF digital audio output from a balanced or unbalanced analogue stereo audio input. It also produces a stereo balanced or unbalanced output from an incoming AES/EBU or SPDIF digital input signal.

At any given time, the unit operates in one of four sync modes:

### Master Mode

The clock signals are generated internally by an on-board master clock at a user-selectable rate: 32kHz, 44.1kHz, 48kHz, 88.2kHz or 96kHz.

### Slave Mode

If a digital signal is present at the selected digital input, the ADA synchronises to it. If no such signal is present, no output is generated.

### Auto Mode

If a digital signal is present at the selected digital input, the ADA synchronises to it. If no such signal is present, the ADA uses its internal master clock at the user-selected sample rate.

### Auto Lock Mode

This operates in the same manner as Auto Mode except that, if no digital signal is present, the ADA uses its internal master clock running at the most recently synchronised sample rate.

*Note: When operating in any other than Master Mode, the front panel power LED will flash whenever the ADA is not synchronised to the incoming digital signal.*

## Input and Output

The CEDAR ADA has analogue inputs and outputs at both professional and consumer signal levels. The professional level signals are electronically balanced and use XLR connectors, while the consumer signals are unbalanced and carried by RCA (phono) connectors. In each case, the input level is adjustable over a range of 18dB, and the output level may be set to one of three levels, each separated by 6dB.

There is a button to select professional or consumer input. Both outputs are active at all times. There are also buttons to select the AES/EBU or SPDIF input or output for the D/A and A/D sections.

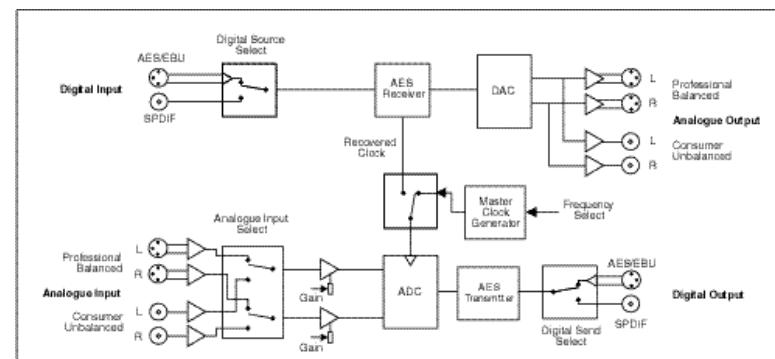
You may define the channel status bits embedded within the digital audio. For sample rates of 32kHz, 44.1kHz and 48kHz, the status bits can be set to Professional or Consumer mode. For sample rates above 48kHz, the status bits will be forced to Professional mode because these rates are not supported by Consumer mode.

### Front Panel LED

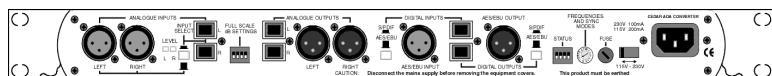
The LED on the front panel is normally red to indicate that power is present. It has a secondary role to indicate the status of the digital inputs.

*Note: Fast flashing between red and amber indicates either (i) a loss of digital input or (ii) that the unit is being calibrated.*

### Block Diagram



## REAR PANEL CONNECTIONS AND OPERATION



### Inputs

#### XLR Analogue Inputs (Left and Right)

The XLR 3-pin sockets used for the analogue left and right channel inputs are electronically balanced and have an impedance of greater than 10k bridging. Each XLR has the following connections:

- Pin 1: Screen.
- Pin 2: Signal +ve (hot)
- Pin 3: Signal -ve (cold)

#### RCA Phono Inputs (Left and Right)

The left and right RCA (phono) analogue inputs are unbalanced and have an impedance of greater than 20k .

#### Input Level Adjustment

The input gain can be adjusted individually for the left and right channels using the DIP switches and the preset potentiometers accessible on the rear panel. The input gain can be set such that signals of +12, +18 or +24dBu generate full-scale signals in the digital domain. Individual preset controls provide a further  $\pm 3$ dB to give an input level range of +9dBu to +27dBu.

	+12	+18	+24
Switch 1	OFF	ON	ON
Switch 2	OFF	OFF	ON

	+12	+18	+24
Switch 3	OFF	ON	ON
Switch 4	OFF	OFF	ON

The consumer input on the phono connector has a further gain of 10dB to provide an input level range of -1dBu to +17dBu.

### AES/EBU Input

The digital input XLR 3-pin socket has an impedance of 110 . It has the following connections:

- Pin 1: Screen.
- Pin 2: Signal +ve (hot)
- Pin 3: Signal -ve (cold)

### SPDIF Input

The SPDIF input has an impedance of 75 .

### Outputs

#### Analogue Outputs (Left and Right)

The XLR 3-pin output connectors are electronically balanced with an output impedance of less than 50 . They have the following connections :

- Pin 1: Screen.
- Pin 2: Signal +ve (hot)
- Pin 3: Signal -ve (cold)

#### RCA phono Outputs (Left and Right)

These RCA (phono) outputs are unbalanced and have an output impedance of less than 75 .

#### Output Level Adjustment

The output gain can be adjusted individually for the left and right channels using the rear panel DIP switches. Each output gain can be set such that a full-scale digital output provides +12, +18 or +24dBu output on the analogue XLR connectors.

The level at the unbalanced output is 10dB lower than at the balanced output.

### AES/EBU Output

The digital output XLR 3-pin socket has an impedance of 110 , and output signals comply with IEC 60958. The socket has the following connections:

- Pin 1: Screen.
- Pin 2: Signal +ve (hot)
- Pin 3: Signal -ve (cold)

### SPDIF Output

The SPDIF output has an impedance of 75 .

## Rear Panel Controls

### Status Select Switches

These switches determine the channel status of the digital signals. The channel status bits of the digital audio signal can be Professional or Consumer, as determined by switch 1.

*Note: At sample rates higher than 48kHz, Consumer mode is not available, so Professional mode is used and this switch is ignored.*

If de-emphasis is selected (switch 2) the ADA will decode 50/15µs emphasis when the incoming channel status indicates that this is appropriate.

The wordlength for the A/D conversion can be set to 24, 20 or 16 bits (switches 3 and 4). When the signal is truncated from 24 bits, a psychoacoustic filter is applied to maintain optimum signal quality. These settings are summarised by the following tables:

STATUS		
Switch 1	ON	PROFESSIONAL
Switch 1	OFF	CONSUMER
Switch 2	ON	DE-EMPHASIS ON
Switch 2	OFF	DE-EMPHASIS OFF

WORDLENGTH			
	16	20	24
Switch 3	OFF	OFF	ON
Switch 4	OFF	ON	ON

*Note: All current CEDAR digital processors are 24-bit, so we advise you to leave the wordlength at 24 bits.*

### Digital Select Buttons

These buttons allow you to switch between AES/EBU (button out) and SPDIF (button in) for each of the digital input and output.

### Analogue Select Button

This button switches the analogue input between the balanced (button out) and the unbalanced (button in) connectors.

### Frequency and Sync Mode

This rotary switch selects the Synchronisation Mode and the frequency of the digital output when using the on-board clock generator. There are 4 modes of operation:

- Master Sync Mode (Switch positions 0-5)  
The digital output sample rate is set by and locked to the internal clock generator. No sync signal is used.
- Auto Sync Mode (Switch positions 6-B)  
The digital output sample rate follows the digital input. When a digital input signal is not present, the output sample rate is set by and locked to the internal clock generator at the frequency determined by the switch position.
- Auto-Lock Sync Mode (Switch position C)  
No output is generated until lock with a digital input signal is achieved. The digital output sample rate then follows the digital input. If the digital input signal is removed then the output sample rate will be set by and locked to the internal on-board clock generator at the frequency closest to the previous digital input.
- Slave Sync Mode (Switch position D)  
The digital output sample rate follows the digital input. When a digital input signal is not present the digital output is turned off.

The following table summarises this. It shows the sample rate generated by the internal clock in Master and Auto Sync modes.

FREQUENCIES AND SYNC MODES							
KHz	32	44.1	48	64	88.2	96	
MASTER	0	1	2	3	4	5	
AUTO	6	7	8	9	A	B	
AUTOLOCK = C						SLAVE MODE = D	

### Test/Calibration Mode

The calibration cycle calibrates the gain and the zero reference of the A/D converter. For optimum performance, the ADA should be calibrated after you change the Gain settings, ideally after a 10-15 minute settling period.

To calibrate the unit, set the rotary FREQUENCIES AND SYNC MODES switch to position "F". The power LED on the front panel will flash quickly for 2 – 3 seconds and will illuminate fully when the unit is calibrated. Once calibration is complete, reset the rotary switch to the position that you require.

## CE DECLARATION OF CONFORMITY

Date of issue: 19 February 2003

Equipment: CEDAR ADA

Manufacturer: CEDAR Audio Ltd

Address: 20 Home End, Fulbourn, Cambridge CB1 5BS, United Kingdom

This is to certify that the aforementioned equipment, when used in accordance with the instructions in this manual, fully conforms to the protection requirements of the following EC Council Directives: on the approximation of the laws of the member states relating to:

### Electromagnetic Compatibility:

#### *EN55103-1: 1997*

Limits of disturbance for audio apparatus for professional use. For use in environments 1 to 4.

#### *EN55103-2: 1997*

Immunity requirements for audio apparatus for professional use. For use in environments 1 to 4.

### Safety:

#### *EN60950: 1992*

Safety of Information Technology Equipment, Including Electrical Business Equipment.

## SPECIFICATIONS

### A/D Connections

Analogue Inputs:	2 x XLR 3-pin (balanced) (L & R)
	2 x RCA phono (unbalanced) (L & R)
Digital Outputs:	1 x AES/EBU XLR 3-pin plug
	1 x SPDIF RCA phono socket

### A/D Audio Specification

Maximum Input Level:	+27dBu (balanced inputs)
Maximum Input Level:	+17dBu (unbalanced inputs)
Input Impedance:	>10k bridging (balanced inputs)
Input Impedance:	>20k (unbalanced inputs)
Input Levels:	User selectable +12dBu, +18dBu, +24dBu for FSD
Gain Range:	Adjustable 3dB loss to 3dB gain (L and R adjust)
Signal to Noise:	Better than 109dBFS (RMS A-weighted at 24bit)
Dynamic Range:	>110dB

### D/A Connections

Digital Inputs:	1 x AES/EBU XLR 3-pin socket
	1 x SPDIF RCA phono
Analogue Outputs:	2 x XLR 3-pin male (balanced) (L & R)
	2 x RCA phono (unbalanced) (L & R)

### D/A Audio Specification

Max Output Level:	+24dBu (balanced outputs)
Max Output Level:	+14dBu (unbalanced outputs)
Output Impedance:	<50 (balanced outputs)
Output Impedance:	<75 (unbalanced outputs)
Dynamic Range:	>100dB
Output Level:	User selectable 12dBu, 18dBu or 24dBu

### Other Connections

Mains Input:	IEC, 110-120VAC or 220-240VAC switchable, 50-60Hz
Consumption:	10W max

### Physical

Dimensions	480mm (W) x 108mm (D) x 44mm (nominally 1U)
Dimensions (Boxed)	530mm (W) x 205mm (D) x 60mm
Weight	2.2kg (Gross) 1.6kg (Net)

CEDAR Audio Ltd reserves the right to alter specifications without notice. E&OE.

# LICENCE AND LIMITED WARRANTY

## 1. DEFINITIONS

In this Licence and Limited Warranty the following words and phrases shall bear the following meanings:

- 'the Company' is CEDAR Audio Limited of 20 Home End, Fulbourn, Cambridge CB1 5BS, UK;
- 'the System' means an instance of the ADA converter;
- 'this Document' means this Licence and Limited Warranty.

## 2. ISSUE AND USE OF THE SYSTEM

- 2.1 The terms and conditions of this Document are implicitly accepted by any person or body corporate who shall at any time use or have access to the System, and are effective from the date of supply of the System by CEDAR Audio Limited to its immediate customer.
- 2.2 The Company hereby grants to the Licensee and the Licensee agrees to accept a non-exclusive right to use the System.

## 3. PROPERTY AND CONFIDENTIALITY

- 3.1 The System contains confidential information of the Company and its suppliers and all copyright, trade marks, trade names, styles and logos and other intellectual property rights in the System including all documentation and manuals relating thereto are the exclusive property of the Company and its suppliers. The Licensee acknowledges that all such rights are the property of the Company and its suppliers and shall not question or dispute the ownership of any such rights nor use or adopt any trading name or style similar to that of the Company and/or its suppliers.
- 3.2 The Licensee shall not attempt to reverse engineer, modify, copy, merge or transcribe the whole or any part of the System or any information or documentation relating thereto.
- 3.3 The Licensee shall take all reasonable steps to protect the confidential information and intellectual property rights of the Company and its suppliers.

## 4. LIMITED WARRANTY AND POST-WARRANTY OBLIGATIONS

- 4.1 The Company warrants that the System will perform substantially in accordance with the appropriate section of this manual for a period of one year from the date of supply to the Company's immediate customers.
- 4.2 The Company will make good at its own expenses by repair or replacement any defect or failure that develops in the System within one year of supply to the Company's immediate customer.
- 4.3 The Company shall have no liability to remedy any defect, failure, error or malfunction that arises as a result of any improper use, operation or neglect of the System, or any attempt to repair or modify the System by any person other than the Company or a person appointed with the Company's prior written consent.
- 4.4 In the case of any defect or failure in the System occurring more than twelve months after its supply to the Company's immediate customer the Company will at its option and for a reasonable fee make good such defect or failure by repair or replacement (at the option of the Company) subject to the faulty equipment having first been returned to the Company. The Company will use reasonable efforts to return repaired or replacement items promptly, all shipping, handling and insurance costs being for the account of the Licensee.
- 4.5 The above undertakings 4.1 to 4.4 are accepted by the Licensee in lieu of any other legal remedy in respect of any defect or failure occurring during the said period and of any other obligations or warranties expressed or implied including but not limited to the implied warranties of saleability and fitness for a specific purpose.
- 4.6 The Licensee hereby acknowledges and accepts that nothing in this Document shall impose upon the Company any obligation to repair or replace any item after a time when it is no longer produced or offered for supply by the Company or which the Company certifies has been superseded by a later version or has become obsolete.

## 5. FORCE MAJEURE

The Company shall not be liable for any breach of its obligations hereunder resulting from causes beyond its reasonable control including, but not limited to, fires, strikes (of its own or other employees), insurrection or riots, embargoes, container shortages, wrecks or delays in transportation, inability to obtain supplies and raw materials, or requirements or regulations of any civil or military authority.

## 6. WAIVER

The waiver by either party of a breach of the provisions hereof by the other shall not be construed as a waiver of any succeeding breach of the same or other provisions, nor shall any delay or omission on the part of either party to exercise any right that it may have under this Licence operate as a waiver of any breach or default by the other party.

## 7. NOTICES

Any notices or instruction to be given hereunder shall be delivered or sent by first-class post or telecopier to the other party, and shall be deemed to have been served (if delivered) at the time of delivery or (if sent by post) upon the expiration of seven days after posting or (if sent by telecopier) upon the expiration of twelve hours after transmission.

## 8. ASSIGNMENT AND SUBLICENSING

The Licensee may at his discretion assign the System and in doing so shall assign this Licence its rights and obligations to the purchaser who shall without reservation agree to be bound by this Licence. The original Licensee and any subsequent Licensees shall be bound by the obligations of this Licence in perpetuity.

## 9. LIMITATION OF LIABILITY

The Company's maximum liability under any claim including any claim in respect of infringement of the intellectual property rights of any third party shall be, at the option of the Company either:

- (a) return of a sum calculated as the price received for the System by the Company from its immediate customer depreciated on a straight line basis over a one year write-off period; or
- (b) repair or replacement of those components of the System that do not meet the warranties contained within this Document.

The foregoing states the entire liability of the Company to the Licensee.

## 10. CONSEQUENTIAL LOSS

Even if the Company has been advised of the possibility of such damages, and notwithstanding anything else contained herein the Company shall under no event be liable to the Licensee or to any other persons for loss of profits or contracts or damage (whether direct or consequential) arising in connection with the System or any modification, variation or enhancement thereof and including any documentation or data provided by the Company or for any other indirect or consequential loss.

## 11. ENTIRE AGREEMENT

The Company shall not be liable to the Licensee for any loss arising in connection with any representations, agreements, statements or undertakings made prior to the date of supply of the System to the Licensee.

## 12. TERMINATION

This Licence may be terminated forthwith by the Company if the Licensee commits any material breach of any terms of this Licence. Forthwith upon such termination the Company shall have immediate right of access to the System for the purpose of removing it.

## 13. SEVERABILITY

Notwithstanding that the whole or any part of any provision of this Document may prove to be illegal or unenforceable the other provisions of this Document and the remainder of the provision in question shall remain in full force and effect.

## 14. HEADINGS

The headings to the Clauses are for ease of reference only and shall not affect the interpretation or construction of this Document.

## 15. LAW

This Document shall be governed by and construed in accordance with English law and all disputes between the parties which cannot be resolved by negotiation shall be determined by arbitration in England in accordance with the Arbitration Act 1950 and 1979.

# CEDAR ADA

Inspected:	
QC Engineer:	
Serial number:	

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