Prism Sound

Dream AD-124

Operation Manual

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1. INTRODUCTION

The *Dream AD-124* converter is intended for professional audio use in applications where a large dynamic range is required; for example in the production of high quality 16-Bit CD masters - where noise shaping can provide a weighted dynamic range of more than 110dB, or for conditions such as live recording where a large amount of headroom may be required.

In addition to the 24-Bit output mode the unit can provide 16-Bit or 20-Bit outputs with optional *Super Noise Shaping* (SNS). With SNS activated the subjective signal to noise ratio is increased at the expense of a spectrally shaped noise floor with more noise at high frequencies.

The Prism *Dynamic Range Enhancement* (DRE) encoding system provided on the unit is used for professional recording where 20 or 24-Bit recording systems are not available. DRE is normally used to make high dynamic range, DRE-encoded, recordings onto 16-Bit DAT. These recordings can then be transferred to a high resolution digital audio workstation through a DRE decoding processor such as in the *Dream AD-124* or the *Dream DA-1*. Use of DRE allows an increased dynamic range to be carried in the 16-Bit recorder data channel without using noise shaping (SNS) - which should not be applied until after the last stage of high resolution signal processing. Though not as transparent as a 20 or 24-Bit recorder, the DRE encode/decode process provides the ability to record virtually the full dynamic range of the *Dream AD-124* on a 16-Bit medium.

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2. GETTING STARTED

This section deals with three subjects; the first is unpacking and checking that you have all of the items that are on the inventory below. The second deals with connecting up and starting work and the third explains in more detail the capabilities and applications of the *Dream AD-124*.

2.1. Unpacking the product

Check that you have the following items and that they are undamaged:

- *Dream AD-124* converter unit
- A copy of this manual
- 2-off BNC to RCA co-axial adaptors
- Mains lead

Check that the *Dream AD-124* carries a label on the rear panel indicating the correct mains voltage for your application area and that the mains lead is of the correct type. If not, DO NOT CONNECT THE MAINS SUPPLY, but contact your distributor.

Keep the packaging for re-use when the unit is be shipped to another location or in the event that it should ever need to be returned to Prism Media Products Limited for repair.

2.2. Using the *Dream AD-124* for the first time

To set up the converter quickly for A-D conversion, set the input gain switches (on left hand side when viewed from the rear) to:

1	Up	
2	Down	(Left channel input clipping level = 18dBu)
3	Up	
4	Up	
5	Up	
6	Down	(Right channel input clipping level = 18dBu)
7	Up	
8	Up	

Set the synchronization/input select control switches (right hand side) on the rear to:

1,2,3,4 & 5	Up	(Spare, set up for future compatibility)
6	Down	(Internal sync to 44.1kHz)
7	Down	(Lock to external sync, if present)
8	Up	(Use XLR for external sync)

Connect an analogue source to the analogue inputs (the switch settings described above set the analogue level required for digital full-scale modulation to +18dBu); these are wired as:

XLR - Female Left & Right Channel Inputs:

pin 1 Chassis & Mains (safety) earth
pin 2 Balanced input (Hot or `+')
pin 3 Balanced input (Cold or `-')

For connecting to an unbalanced output connect pin 2 of the input XLR to the signal conductor of the output and pin 3 of the input XLR to the return or screen conductor of the output. (To avoid problems with electromagnetic compatability (EMC) pin 1 should also be connected to the cable screen).

Connect the digital output to a suitable destination such as a DAT or hard-disk recorder and arrange to monitor the input of the destination device. (Typically set your digital

recorder into `Record & Pause' mode and monitor at the recorder analogue output, or use a digital to analogue converter, such as the *Dream DA-1*.

Connect the mains supply and switch on the *Dream AD-124* unit.

The front-panel LEDs should all illuminate momentarily and then go through a start-up sequence which ends with the four right hand LEDs being extinguished in order left to right. They will then revert to the operational state. For the above rear panel switch settings this would be:

Power	ON
Local ref	ON (providing no external ref. connected)
44.1	ON
48.0	OFF

The other LEDs will reflect the state of the unit when it was last used. If powered up with the factory defaults (see section 3.5) then they should be illuminated as follows:

16-Bit	Off
24-Bit	On

Dither inactive	Off

Meters	Dependent on signal level on analogue inputs

Front-panel controls LEDs

I/P	OFF (If ON then depress to select A-D input)
DRE	OFF (If not OFF then depress control to disable DRE)
SNS	OFF (If ON then depress to disable SNS)
O/P	OFF

Check that variation of the input signal level produces some indication on the level-meter LEDs; at the settings suggested above it will be necessary to provide +18dBu* (0dBFS) to clip the converter and illuminate the red overload indicators. The signal present indicator will light for signals exceeding -48dBFS (-30dBu*) and the mid-level indicator will illuminate for signals exceeding -12dBFS (+6dBu*).

* Note: the levels mentioned here are subject to the +18dBu : 0dBFS gain setting. Refer to section 4 for details.

Try changing the output word-length; press the <O/P> key on the front of the *Dream AD-124* to switch between 16,20 and 24-Bit output. To hear the effect you would need a very low input level signal (about -70 to -80dBFS) and a substantial amount of gain applied in the digital domain after the digital output; great care should be exercised when doing this as damage (or injury) may occur when very high gains are used. Alternatively, use an FFT analyzer such as the Prism Sound *DScope.*

The settings above select flat dither as the linearization method for 16-Bit and 20-Bit output. SNS noise-shaping can be used by pressing the SNS control, and is indicated by that control being illuminated. Details for selecting the SNS curve are given later in the manual.

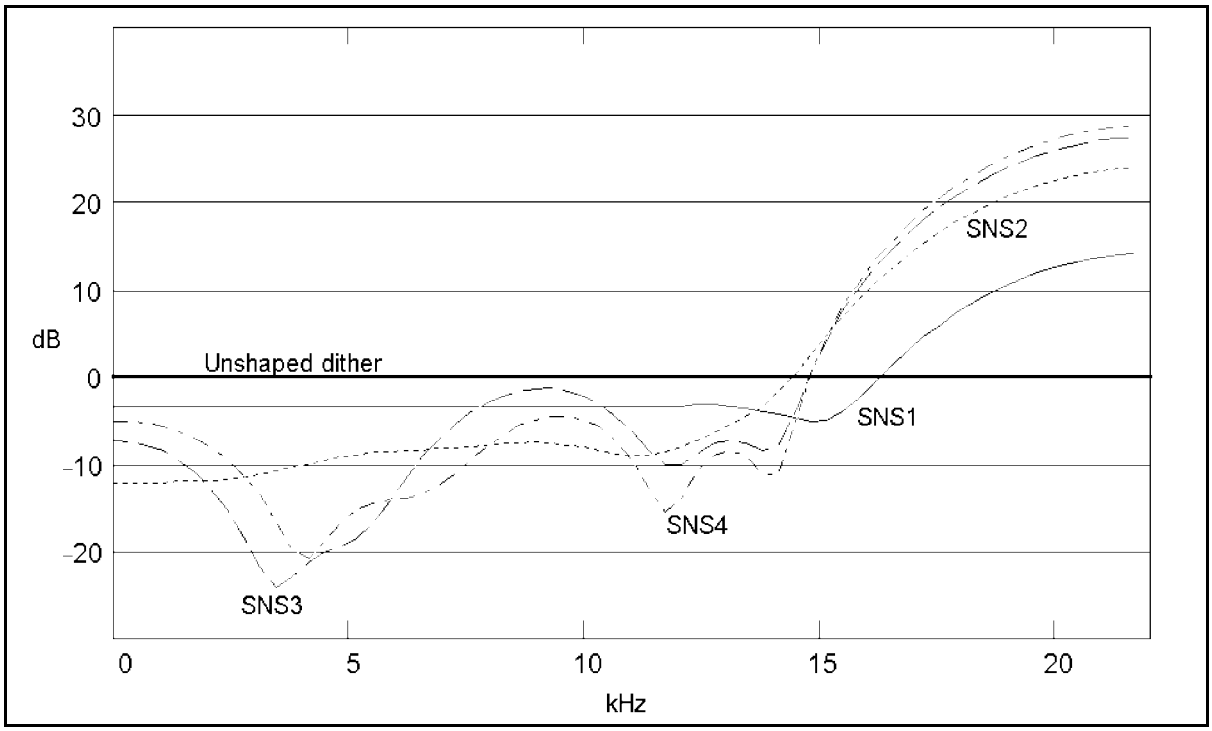
2.3. Product concept and capabilities

The *Dream AD-124* is a more complex and sophisticated product than other A-D converters because it provides several functions in one unit.

Primarily, it provides a very high quality A-D converter, but two other important features are also provided related to its use with 16-Bit media. These are Super-Noise-Shaping (SNS) and Dynamic Range Enhancement (DRE).

When producing a 16-Bit output from a higher resolution signal it is necessary to apply noise at the truncation point to avoid un-natural sounding truncation distortion. This will result in a quantization noise floor, for 16-Bit systems, 93dB below full scale level. SNS and DRE both use dither but use digital signal processing techniques to reduce the perceived level of this quantization noise in order to maintain some of the advantage of a high resolution system onto 16-Bits.

SNS is a fully compatible process designed to reduce the perceived level of the quantization noise-floor by shaping it in the frequency domain. As a result this quantization noise is reduced to inaudiblity at all but the highest replay levels. The SNS processing modifies the spectrum of the quantization noise so that noise is reduced at frequencies where the human ear is more sensitive at the expense of it being raised at frequencies where hearing is less sensitive. This is shown in the following figure.



SNS noise spectra compared
The curves illustrated are for 16 bit 44.1kHz operation

Super-Noise-Shaping results in a noise penalty in the high-frequency end of the audio band above 15kHz and is suitable only after all signal processing has been completed. For this reason, though SNS processing can be applied in A-D input mode, it is normally applied to an edited 20 or 24-Bit signal from a digital audio workstation after all signal manipulation has been completed. The process is completely compatible with existing CD players; however best performance will be obtained (the benefit of SNS) with high-performance D/A converters with 18-Bit or better dynamic range.

DRE is a process designed for quite a different purpose. This process is **NOT** compatible with existing players. It is designed for use with DAT or other 16-Bit recorders (such as CD-R or 1630+U-matic) but requires a decode process on playback.

DRE is intended for applications where 20-Bit dynamic performance is desired of the recorder but only a 16-Bit recorder is available. DRE does not add noise like SNS but it does require decoding before sending to D/A converters for playback.

The *Dream AD-124* provides both DRE coder and decoder; the coder can be used either

with the A-D converter input **OR** with the digital input (D-D mode), so that 20-Bit digital material can be reduced for 16-Bit recording. The decoder can be used only with the digital input. It can have 20-Bit linear output (probably the most common method of use) or a 16-Bit linear output can be generated in conjunction with either SNS or flat dither (depending on the state of the SNS control).

The Prism *Dream DA-1* digital to analogue converter also supports DRE decoding to 20-Bit linear output and analogue, simultaneously, and so it can be used for monitoring a DRE encoded recording being made with a *Dream AD-124*.

3. FRONT PANEL OPERATIONAL CONTROLS

There are four push-button controls on the front panel. These controls allow access to all the signal processing functions.

There are also configuration switches on the rear panel, for controlling sample frequency, synchronization and the analogue input full-scale level. These are described in following sections.

3.1. I/P (Input) mode front-panel control

This electronically latching push-button switches between digital input (D-D) and analogue input (A-D) mode. D-D mode is selected when the LED is illuminated. On momentarily pressing the push-button the indicator will be dimly illuminated to indicate that the *Dream AD-124* is changing mode.

The state of this control is stored in non-volatile memory and it is restored when the unit is switched on.

When changing between A-D and D-D mode the settings of the three other controls are restored to the settings they were in when the unit was last in the new mode. Therefore the DRE, SNS and output word-lengths settings for the two modes are independent and the I/P mode selection should be set **before** changing any of the other settings or the SNS curve selection.

3.2. DRE (*Dynamic Range Enhancement*) front-panel control

Depressing this push-button switches the DRE function between off (default), DRE encode and, for D-D mode only, DRE decode.

In DRE encode mode the *Super-Noise-Shaping* (SNS) and output word-length (O/P) controls are disabled.

The state of this control is set independently for A-D and D-D mode, and both settings are stored in non-volatile memory.

DRE Indicator	A-D input mode	D-D input mode
Off	Linear - DRE off	Linear - DRE off
On	DRE encode	DRE encode
Flashing	Not available	DRE decode

3.3. SNS (*Super-Noise-Shaping*) front-panel control

This control switches on the *Super-Noise-Shaping* (SNS) function and is also used to enter the SNS selection mode. This control is disabled in DRE encode mode.

3.3.1 SNS on/off function

If depressed briefly this push-button toggles the *Super-Noise-Shaping* (SNS) function. When SNS is enabled the integral indicator is illuminated.

The state of this control is set independently for A-D and D-D mode, and both settings are stored in non-volatile memory.

When SNS is not enabled, a spectrally flat triangular probability function dither is used (unless the automatic dither muting function, described in section 6.5, has activated).

In A-D input mode the SNS function is active whenever SNS is enabled by this control. In D-D mode the SNS function is also controlled by the automatic dither muting function described in section 6.5.

3.3.2 SNS selection mode

If the SNS control is held down for one second then the four front panel control buttons become selectors for the four possible SNS curves as shown by the text underneath the buttons.

SNS selection mode is identified by one of the four control-button indicators flickering with the other indicators being off.

The SNS curve that is presently selected is shown by the flickering indicator. To change the selection briefly depress the push-button corresponding to the desired selection.

Exit the SNS selection mode by depressing the selected SNS control a second time. The other controls should remain unchanged except that the SNS function is always enabled by entering SNS selection mode.

The SNS selection is set independently for A-D and D-D mode, and both settings are stored in non-volatile memory, even if the SNS function is not enabled.

3.4. O/P (Output) word length front-panel control

Briefly depressing this push-button flashes the control button indicator and steps to the next digital output word-length in the sequence 16-Bit, 20-Bit and 24-Bit, as shown on the indicators elsewhere on the front panel (see section 6.4). This control is disabled in DRE encode mode.

The state of this control is set independently for A-D and D-D mode, and both settings are stored in non-volatile memory.

3.5. Resetting controls to factory defaults

It is possible to restore all controls settings to the factory defaults. This loses all record of custom settings other than those set by the rear panel DIP switches.

To reset controls to factory defaults power-on the unit with all four front panel buttons depressed. After the four button indicators have come on, briefly extinguished, and illuminated again then release the controls. The unit should then be in the following A-D input mode with the following settings:

3.5.1 A-D mode factory default settings

DRE: Off (linear)
SNS: Off
SNS curve: SNS3
Output24-Bit

Note: The SNS setting and SNS curve selection cannot be changed while the output word-length is at 24-Bit.

3.5.2 D-D mode factory default settings

DRE: Off (linear)
SNS: On
SNS curve: SNS3
Output: 16-Bit

4. ANALOGUE LEVEL CONFIGURATION

The analogue level corresponding to maximum digital level (0dBFS) can be adjusted to either standard settings or with a continuously variable control. These controls are on the left hand switch bank on the rear panel in conjunction with two screw driver adjustments adjacent to the switch bank.

These controls are described as viewed from the rear of the unit.

The switch settings are shown in the table below:

Level	1	2	3	4	5	6	7	8
+12dBu	Up	Up	Down	Up	Up	Up	Down	Up
+18dBu	Up	Down	Up	Up	Up	Down	Up	Up
+28dBu	Down	Up	Up	Up	Down	Up	Up	Up
Variable	Up	Up	Up	Down	Up	Up	Up	Down

The switches are in two banks, switches 1 to 4 for the left channel and 5 to 8 for the right channel. Only one switch per bank should be down. The variable setting allows adjustment with the screw-driver potentiometers to either side of the switch bank (the control next to switch 1 is for the left channel).

5. SAMPLING FREQUENCY SYNCHRONIZATION

The right hand bank of rear panel switches controls the sampling frequency synchronization of the unit using switches 6,7 and 8. Switches 1-5 are not used and should be left in the up position.

The switch functions are shown in the table:

Switch	Up	Down
1	Not used (up)	
2	Not used (up)	
3	Not used (up)	
4	Not used (up)	
5	Not used (up)	
6	Internal sample rate 48kHz	Internal sample rate 44.1kHz
7	Free-run at internal sample rate selected by switch 6	Attempt to lock to sync source determined by switch 8
8	XLR sync source	BNC or Optical sync source

Switch 6 selects the internal sampling frequency. This has no effect when locked to an external source.

Switch 7 is used to select an internal or external synchronization source.

Switch 8 is used to set which digital input connector is to be used for synchronization and as the digital input in D-D input mode. It selects between the XLR (up) and the BNC or optical (down).

5.1. Internal Sync (Clock Master)

To operate the unit as clock master the synchronization source should be selected to internal by setting switch 7 up. In this case the unit will operate at the sample rate selected by switch 6.

Care should be taken when using the *Dream AD-124* in digital input (D-D) mode with internal synchronization. It must be clock master and so the digital signal source driving the digital input must be synchronized to the digital output of the *Dream AD-124*. In this case the input connector used for the digital audio data input (but not, in this case, for synchronization) is selected by switch 8.

5.2. External synchronization, or clock slave, mode

In many situations the *Dream AD-124* should be operating slaved to another source of synchronization. Operating in analogue input (A-D) mode this can be achieved using either an SDIF-2 word clock or a digital audio interface (AES3 [1], or IEC958 [4]) signal (called in AES11 [2] a Digital Audio Reference Signal, or DARS). When operating in digital input (D-D) mode as a clock slave the *Dream AD-124* will synchronize to the clock embedded within the incoming digital audio data. In all external synchronization modes switch 7 is down.

Switch 6 does not have to match the required sample rate. However when there is loss of external synchronization the *Dream AD-124* will revert to the internal sample frequency selected by this switch and so it may be convenient to leave this set to the normal sample frequency that is used. This will ensure that the sample rate of the digital output does not switch between 44.1 and 48kHz each time the external sync source to the *Dream AD-124* is disturbed.

5.2.1 AES11 slave synchronization on XLR digital audio input

Synchronization to an AES3 (or AES11 DARS) signal can be achieved by connecting it to the XLR Digital Audio input connector and setting switch 7 down and switch 8 up.

5.2.2 Automatic selection between coaxial and optical synchronization sources

The coaxial and optical input formats use the same switch settings. If switches 7 and 8 are both down then the *Dream AD-124* will scan the coaxial and optical inputs for activity. If

there is a digital audio interface signal on either of those inputs, or a word clock signal on the coaxial input then it will use that signal as the synchronization reference. On the coaxial input there is automatic format detection that determines whether the signal is a digital audio interface (IEC958 [4] or AES-3id [5]) or a word-clock signal.

5.2.3 Coaxial digital audio interface slave synchronization

Synchronization to a coaxial digital audio interface signal - either consumer format (IEC958 [4]) or professional format (AES-3id [5]) - can be achieved by connecting it to the BNC digital input connector and setting both switches 7 and 8 down. (For reliable operation of the automatic input selection between coaxial and optical inputs nothing should be connected to the adjacent optical input and the optical input protection cover should be fitted.)

5.2.4 Consumer (IEC958) optical synchronization

Synchronization to an optical digital audio interface signal can be achieved by connecting it to the optical input connector and setting both switches 7 and 8 down. (For reliable operation of the automatic input selection between coaxial and optical inputs the coaxial input should be disconnected when attempting to synchronize to the optical input.)

5.2.5 Coaxial word-clock synchronization

Synchronization to a coaxial SDIF-2 type word-clock signal can be achieved by connecting it to the BNC digital input connector and setting both switches 7 and 8 down. (For reliable operation of the automatic input selection between coaxial and optical inputs the optical input should be disconnected when attempting to synchronize to the coaxial input.)

NOTE : SDIF-2 word-clock cannot be used in D-D mode as the sync source selection determines the digital input source in D-D mode. (There is no digital audio data on the SDIF-2 word-clock sync.)

6. FRONT PANEL INDICATORS

6.1. Power indicator

This illuminates when the unit is powered.

6.2. Local Ref indicator

This illuminates when the unit is locked to the internal source. This will occur if internal lock is selected manually or if the unit cannot find a valid synchronization signal at the selected input.

6.3. 44.1 and 48 indicators

These indicate the sampling frequency.

44.1	*48*	Interpretation
ON	ON	32kHz sample rate
ON	OFF	44.1kHz sample rate
OFF	ON	48kHz sample rate
OFF	OFF	'Other' sample rate (Not within 0.1% of any of the above rates)

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6.4. 16,20 and 24-Bit indicators

The combination of these indicators signifies the output word length for linear output. If DRE coding is use the indicators are extinguished.

16-Bit	*24-Bit*	Interpretation
OFF	OFF	DRE encoded output
ON	OFF	16-Bit linear PCM output
ON	ON	20-Bit linear PCM output
OFF	ON	24-Bit linear PCM output

6.5. *Dither Inactive* (Automatic dither muting) indicator

This indicator illuminates when the automatic dither muting has operated and indicates that the audio output data is an exact copy of the audio input data.

Automatic dither muting only works in digital input (D-D) mode. In analogue input (A-D) mode this will not illuminate.

The automatic dither muting function disables dither or noise-shaping when it is not required in D-D input mode. This occurs when the input word length is the same or less than the output word length and no word-length reduction is occurring within the unit. A digital zero signal at the input will also activate the automatic dither muting. The automatic dither muting only activates after approximately 4000 samples are detected without activity in the part of the audio data that exceeds the output word length. It is deactivated as soon as any activity is detected.

Note that for the AES3 or IEC958 digital audio interface formats the maximum audio word size either 20 or 24-Bit dependent on whether the four bits of auxiliary audio data are being used with the main, 20-Bit, audio word. This application of the auxiliary audio word is defined by the channel status data carried with the audio. If the channel status indicates that the auxiliary audio word is not being used for carrying audio data then it will be masked off to avoid the risk of non-audio and audio data being combined. For this reason 24-Bit audio sources should use the professional channel status format with byte two either set to indicate the correct word length or to the default state of zero.

6.6. Meters

There are three indicators per channels providing indication of peak sample levels.

Red:	Signal clip	(Signal > -0.03dBFS) This holds for approximately 2 seconds.
Orange:	Signal level high	(Signal > -12.04dBFS)
Green:	Signal present	(Signal > -48.16dBFS)

7. CONNECTIONS

Viewed from the rear the connectors are as follows:

Left	XLR-F	Analogue In (Left/A)
	XLR-F	Analogue In (Right/B)
	XLR-F	Digital In (AES3)
	BNC-75S	Digital In (CP340/IEC958) or Word Clock In (SDIF-2)
	OPTICAL INPUT	Digital In (CP340)
	BNC-75S	SDIF-2 output Left channel (CH1) *
	BNC-75S	SDIF-2 output Right channel (CH2) *
	BNC-75S	SDIF-2 Wordclock output *
	OPTICAL OUTPUT	Digital Out (CP340 - consumer)
	BNC-75S	Digital Out (IEC958 - consumer)
Right	XLR-M	Digital Out (AES3)

* Note: SDIF-2 outputs are generated by an optional board which must be ordered separately. However the BNC connectors required to support SDIF-2 are fitted and so the presence of the SDIF-2 connectors does not mean that the option is fitted. The SDIF-2 option includes the internal expansion PCB which provides the necessary electronics to drive the connectors - which are not connected internally unless the SDIF-2 option board is fitted.

XLR wiring conventions, for all signals analogue and digital are:

pin 1 Chassis & Mains earth
pin 2 Balanced input or output (Hot or `+')
pin 3 Balanced input or output (Cold or `-')

8. SPECIFICATION

This specification is offered in good faith but is subject to alteration without notice.

8.1. Analogue Performance

These performance figures apply to operation in 24-Bit mode at a sample frequency of 48kHz. DRE and SNS are disabled, and the input level for full scale output is set to +18dBu unless otherwise stated.

Tests are performed to AES17-1991 (ANSI S4.51-1991) [3] except where stated.

Input Impedance	20kS
Alias rejection	>80dB above 28kHz
Input for full scale amplitude	
Fixed	+28dBu, +18dBu, +12dBu (±0.2dB)
Variable	+8dBu to +24dBu
Input gain stability	<0.01dB over an hour
Frequency response deviation	+0.1 -0.3dB from 1Hz to 20kHz
Maximum level vs frequency	0dBFS from 10Hz to 20kHz (with <-90dB THD+N)
Inter-channel phase deviation	< 1E from 10Hz to 20kHz
Polarity	Non-inverting
Level-dependent gain linearity	< 0.001dB
Idle channel noise	< -120dBFS unweighted < -120dBFS CCIR-RMS weighted < -122dBFS A weighted

Noise with signal (THD+N at -60dBFS, 20-20kHz) same as idle channel noise

THD+N at 997 Hz, -1dBFS < -98dB (0.0012%)

Linear cross-talk	< -90dB from 20Hz to 20kHz	
Common mode rejection	> 70dB	(20Hz - 1kHz)
	> 50dB	(20Hz - 10kHz)

8.2. Delay

8.2.1 ADC Mode 57 samples (48kHz = 1.19ms, 44.1kHz = 1.29ms)

8.2.2 D-D mode 6 samples (48kHz = 125.00 µs, 44.1kHz = 136.05 µs)

8.3. Synchronization

8.3.1 Internal

Sampling Frequency: 44.1 or 48kHz (+/- 10ppm)

8.3.2 External

Sampling Frequency: 30 to 50kHz on AES3 or IEC958 input.
44.1 or 48kHz ±1000ppm on word clock input.

Digital Output Phase: As AES11 standard [2]. (Matched to input phase within 5% of a sampling period.)

External synchronization sources:

1. Digital Audio Reference to AES11 format [2] on XLR (110 S balanced) or BNC (75 S unbalanced) digital input. The same input may also be used as the digital input in D-D mode)

2. Unbalanced 75S SDIF-2 word clock to BNC input.

Note: The BNC input can use either TTL-compatible square-wave Word-clock or digital audio interface (AES3 or IEC958) synchronizing signals. The *Dream AD-124* automatically detects the signal type.

8.4. Digital Output

8.4.1 Formats

XLR	Professional, AES3 (110 S balanced)
BNC	Consumer, SPDIF/IEC958/CP340 (75 S coaxial)
Optical	Consumer, CP340 (TOSLink)

(SDIF-2 coaxial output option is available)

8.4.2 Word length
16, 20 or 24-Bits, dithered or noise-shaped to eliminate truncation distortion.

8.4.3 Channel Status
Professional channel status (AES3 [1]) is set on the XLR connector Consumer channel status (IEC958 [4]) is set on the coaxial output.

An internal link (see section 9.1) can select professional status for both outputs simultaneously; useful when 75-ohm co-axial format is used for transmission of AES-3id [5] signals.

SCMS is **NOT** asserted on the consumer output.

8.5. Power

8.5.1 Mains voltage: Internally set for 90-120V (Brown and Red transformer connections) or 195-250V operation. (Brown and Orange transformer connections). The selected supply voltage is indicated on the rear panel.

WARNING: To maintain product safety and reliability any changes to this setting should only be performed by the manufacturer.

8.5.2 Consumption: <25W

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8.6. Physical Dimensions

19 inch (483mm) width (rack-mountable)
1U (44mm) high when rack-mounted
48mm high when free-standing on rubber feet
10.25 inches (260mm) deep (including protruding BNC connectors to rear)

Note: The rubber feet may be removed by using a small screwdriver to lever out the plastic pin inside each foot. Once this is removed the rubber foot can then be levered out. This may be achieved without dismantling the unit or damaging the foot: which can be re-fitted by reversing the dismantling procedure.

9. PCB LINK SETTINGS

NOTE: The unit should not be dismantled, or the lid removed, except by qualified personnel. In order to maintain the cover of the manufacturer's warranty this should only be performed by Prism Media Products Limited or their agent.

The following PCB links are at the factory:

LK1	-	Left channel analogue input pin 1 to chassis, factory fitted
LK2	-	Link factory fitted pins 1-2
LK3	-	Link factory fitted pins 1-2
LK4	-	Link factory fitted pins 2-3 (also used by SDIF option board)
LK5	-	Link factory fitted pins 1-2
LK6	-	Not fitted
LK7	-	Link factory fitted pins 1-2
LK8	-	Link factory fitted pins 1-2 or 39 ohm resistor
LK9	-	No link 9
LK10	-	Left channel analogue input pin 1 to chassis, factory fitted

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9.1. Channel Status Format

It is possible to set the coaxial output to either consumer or professional Channel Status format. This is set by Link 4 as follows:

Link 4 (LK4) pins 1-2 linked :	Optical & coaxial outputs have AES/EBU (professional) Channel Status
Link 4 (LK4) pins 2-3 linked :	Optical & coaxial outputs have SPDIF (consumer) Channel Status (default)

If the SDIF option board is fitted the shorting link on the 3 contact connector should be fitted in the link position described above.

9.2. Analogue input ground connection

The input cable screen is normally wired to pin 1 of the XLR connector. This contact is capacitatively coupled to the chassis. LK1 and LK10 are fitted to connect the pin 1 contacts of the analogue left and right inputs to the chassis directly.

In some circumstances these links can be removed to eliminate low frequency circulating earth currents flowing along cable screens between equipment. By default the links should be fitted to minimise common mode signals.

10. ELECTROMAGNETIC COMPATIBILITY

This equipment is intended for use in an electromagnetically controlled environment. To maintain the performance specification it should not be subject to strong magnetic fields (such as in the immediate vicinity of a power amplifier or cathode ray tube) and all connections should be terminated as described below. This is also required to ensure that emissions are within applicable norms and that the unit does not interfere with other equipment.

All coaxial connections should be made using a properly screened 75S cable with the screen connected to the outer of the connector at both ends. All XLR connections should use a screened twisted pair cable with the screen connected to pin 1 of the XLR connector at both ends. In the case of the digital XLR connections this cable should be of 110S impedance.

11. REFERENCES

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[4] IEC958 - `Digital Audio Interface' International Electrotechnical Commission 1989

[5] AES-3id-1995 - `AES information document for digital audio engineering - Transmission of AES3 formatted data by unbalanced coaxial cable' *J. Audio Eng. Soc.*, Vol. 43 No. 10, pp 827-844 (October 1995)

12. FURTHER INFORMATION

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