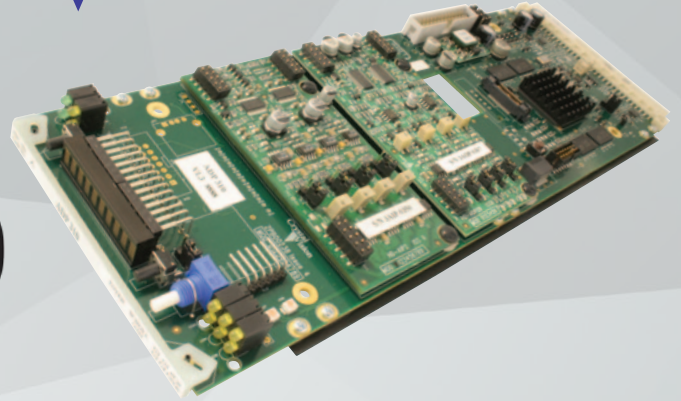


# Crystal Vision

## ADP 310



### Audio delay and processor for AES and analogue audio

ADP 310 is a flexible audio delay line and processor for multiple channels of discrete analogue or digital audio.

It provides up to 400ms of user adjustable delay for four stereo pairs of AES or two stereo pairs (four mono channels) of analogue audio – along with gain adjustments, stereo to mono conversion, channel muting and inversion, audio shuffling and signal monitoring.

With ADP 310 you'll need just one product for all your discrete audio delay and processing requirements – whether you need to match your audio to a delayed video path, process your audio or re-order your audio channels.

- ① **One product for all your discrete audio delay and processing requirements:** works with analogue or digital audio
- ② **Use it with multiple channels of audio:** fit one input piggyback and one output piggyback for either four stereo pairs of AES or two stereo pairs (four mono channels) of analogue audio
- ③ **Use it as an analogue or digital audio delay line:** includes up to 400ms of user adjustable delay, adjustable in 1ms steps
- ④ **Use it as an audio processor:** with gain adjustments, stereo to mono conversion and channel muting and inversion
- ⑤ **Use it as an audio shuffler:** with flexible audio routing
- ⑥ **Monitor your signals:** with alarm indication of reference missing, audio missing and audio silence
- ⑦ **Save rack space:** 100mm x 266mm module allows 12 ADP 310 in 2U (six in 1U and two in desk top box)
- ⑧ **Flexible control:** select from board edge, front and remote panels, GPIs, SNMP, PC software or web browser

## ONE PRODUCT FOR ALL YOUR AUDIO DELAY AND PROCESSING REQUIREMENTS

ADP 310 is a versatile audio delay line and audio processor for systems using multiple channels of discrete analogue or digital audio.

ADP 310 can be used to delay and process analogue audio, synchronous 48kHz AES or asynchronous 48kHz AES. To lock all the audio clocks, ADP 310 needs to be timed to an external tri-level syncs or Black and Burst analogue reference. Asynchronous linear audio will automatically be resampled.

Should Dolby E be routed through the ADP 310, it won't be damaged. ADP 310 detects Dolby E automatically and will ensure it avoids the audio processing, resampling and delay. It is possible to shuffle locked Dolby E channels using the audio router.



## CONFIGURE IT USING PIGGYBACKS

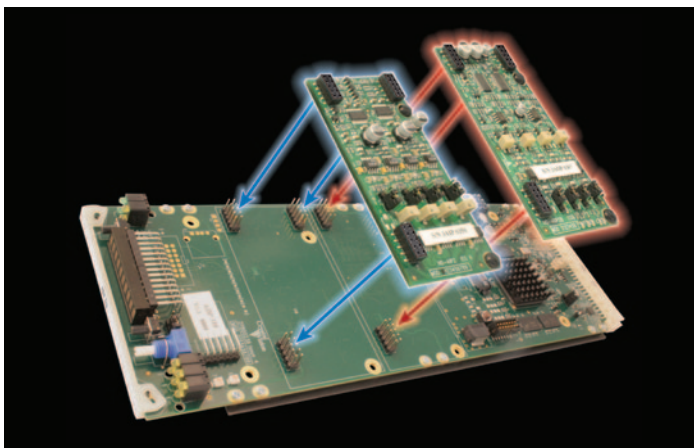
ADP 310 inputs and outputs audio by fitting two audio piggybacks to the main board. ADP 310 is always fitted with one input piggyback and one output piggyback.

Three different piggybacks are available. For analogue audio the 3G-AIP2 is used to input two stereo pairs or four mono channels and the 3G-AOP2 to output two stereo pairs or four mono channels. For digital audio the DIOP4 piggyback is used to either input four stereo pairs or output four stereo pairs – with the front-positioned DIOP4 automatically configured as AES inputs and the rear-positioned DIOP4 as AES outputs.

It is not possible to mix analogue and digital piggybacks on this product.

### Which piggybacks can I fit?

Front position (audio input)	Rear position (audio output)	What it gives you
DIOP4	DIOP4	AES I/O
3G-AIP2	3G-AOP2	Analogue audio I/O



## USE IT AS AN AUDIO DELAY LINE

ADP 310 can be used as an analogue or digital audio delay line, providing flexible compensation for any equipment that has delayed your separate video.

Up to 400ms of audio delay is available, adjustable in 1ms steps. One delay value can be set and individual audio channels can then have the delay switched either on or off.



## USE IT AS AN AUDIO PROCESSOR

ADP 310 provides extensive audio processing for the linear AES. Dolby E signals automatically bypass all audio processing.

Audio gain adjustment allows the audio levels to be increased or decreased to match the rest of the system, with each channel independently adjustable between +18dB and -18dB in 0.1dB steps.

The available stereo to mono conversion could be useful for those broadcasting a multi-language service or for monitoring how the audio sounds when downmixed to mono.

Each of the audio channels can be muted to silence – useful for removing unwanted audio such as sporting commentary or a language you do not intend to broadcast. Channels can be individually inverted, allowing correction for any reversed wiring of differential pairs.

## USE IT AS AN AUDIO SHUFFLER

You can also use ADP 310 as a small audio router, allowing you to choose the arrangement of your audio I/O.

ADP 310 has one input/output mono audio routing matrix which allows any audio channels to be shuffled. This is known as the 4 x 4 AOP output router if an analogue 3G-AOP2 output piggyback is fitted and as the 8 x 8 AES output router if a digital DIOP4 output piggyback is fitted.

Dolby E channels can be shuffled using the audio router, if required.

## ALWAYS KNOW THE STATUS OF YOUR SIGNAL

Signal monitoring is available, with alarm indication provided via either two GPI outputs or SNMP traps.

There are nine alarms available for AES: reference video missing, AES input channel pair missing (four alarms) and AES input channel pair silent (four alarms). Analogue audio has three alarms: reference video missing and analogue input channel pair silent (two alarms). Reference missing and audio missing will assert an alarm immediately. The silence alarms will be triggered if the audio is consistently below -63dBFS and can be delayed by up to 127 seconds before an alarm is asserted to prevent false alarming during quiet audio periods.

## SAVE RACK SPACE

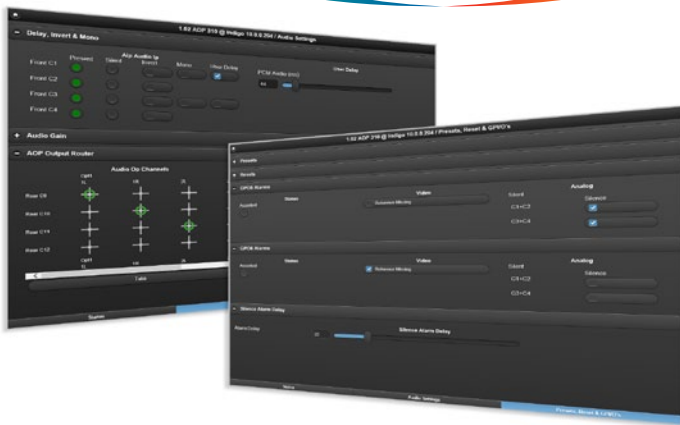
ADP 310 is a space-saving 100mm x 266mm module which is housed in the Indigo frames – available in 2U, 1U and desk top box sizes – with up to 12 boards fitting in 2U.

ADP 310 is used with the RM47 frame rear module for analogue audio or 110 ohm AES and with the RM74 rear module for 75 ohm AES.

## EASY AND FLEXIBLE CONTROL

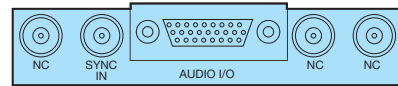
ADP 310 is very straightforward to operate, with control options including board edge switches, an integrated control panel on the AE frames, the VisionPanel remote control panel, GPIs, SNMP, the Statesman Lite PC software and the VisionWeb web browser control.

Up to 16 user-defined presets, containing the board setup data, may be stored and recalled – with four GPIs dedicated to this function.



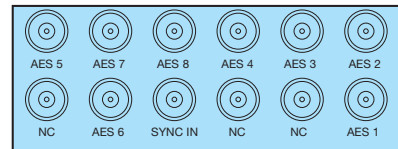
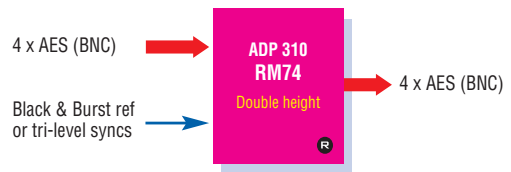
## REAR MODULE CONNECTIONS

### For applications using 110 ohm AES or analogue audio



RM47

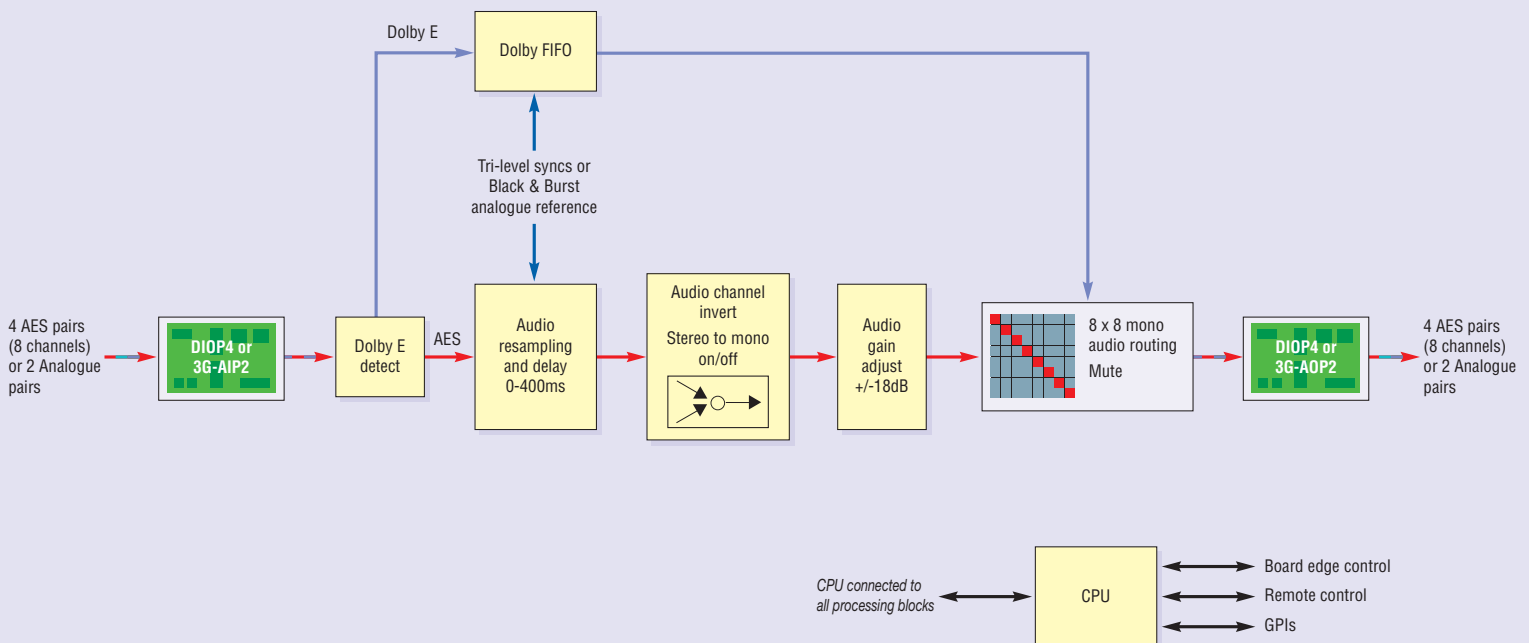
### For applications using 75 ohm AES



RM74

NB. AES 1-4 are audio inputs and AES 5-8 are audio outputs

## THE INPUTS AND OUTPUTS



## SPECIFICATION

### MECHANICAL

Standard Crystal Vision module 266mm x 100mm  
Weight: 200g  
Power consumption: 9 Watts

### AUDIO INPUTS AND OUTPUTS

ADP 310 can be used with discrete analogue audio, synchronous 48kHz AES, asynchronous 48kHz AES and locked Dolby E

Use RM47 frame rear module for 110 ohm AES or analogue audio and RM74 for 75 ohm AES

One input piggyback and one output piggyback must be fitted to the main board. Front position is always audio in and rear position is always audio out. The audio piggybacks must both be analogue or both be digital

*For analogue audio:*

Use one 3G-AIP2 piggyback to input 2 x analogue audio stereo pairs (4 mono)

Use one 3G-AOP2 piggyback to output 2 x analogue audio stereo pairs (4 mono)

*For digital audio (75 ohm or 110 ohm):*

Use one DIOP4 piggyback to input 4 x AES stereo pairs

Use one DIOP4 piggyback to output 4 x AES stereo pairs

### ANALOGUE REFERENCE

To lock all the audio clocks, ADP 310 needs to be timed to an external tri-level syncs or Black and Burst analogue reference

### DOLBY E HANDLING

Dolby E data will be automatically detected and will bypass the audio processing, resampling and delay.

Dolby E channels can be shuffled using the 8 x 8 audio router

### AUDIO DELAY

Minimum delay through board <200us

Up to 400ms user adjustable audio delay, adjustable in 1ms steps. One delay value can be set and individual channels then have the delay switched either on or off

### AUDIO PROCESSING

Audio processing can be applied to linear AES only. It cannot be applied to Dolby E Gain level adjustment on each channel

between +18dB and -18dB in 0.1dB steps with 0dB calibration

Mute

Inversion

Stereo to mono conversion. The first channel of the stereo pair is converted to mono, with the second channel unchanged. The mono output is gain corrected to maintain unity gain

### AUDIO RESAMPLING

ADP 310 will automatically resample asynchronous linear audio to lock the audio to the reference input

### AUDIO ROUTING

ADP 310 has one input/output mono audio routing matrix which allows any audio channels to be shuffled. This is known as the 4 x 4 AOP output router if a 3G-AOP2 is fitted and as the 8 x 8 AES output router if a DIOP4 is fitted

The audio router is auto configured according to the piggyback options fitted to the motherboard

### SIGNAL CHECKS

Checks can be performed on a selection of parameters, with warnings of any problems provided via two GPI outputs or SNMP traps

There are nine alarms available for AES: reference video missing, AES input channel pair missing x 4 and AES input channel pair silent x 4

There are three alarms available for analogue audio: reference video missing and analogue input channel pair silent x 2 Reference missing and audio missing will assert an alarm immediately. The silence alarms will be triggered if the audio is consistently below -63dBFS and can be delayed by up to 127 seconds before an alarm is asserted to prevent false alarming during quiet audio periods

### LED INDICATION OF:

Power supplies on board

AES 1 to 4 present

GPI output 5 active

GPI output 6 active

### PRESETS

The current board settings can be saved in one of 16 locations to be recalled as required

### GPI INPUT LEVELS

Active: pull to ground, pulled up to +5V through 10 kohm

### GPI OUTPUT LEVELS

Electrically: Open collector transistors 30V, 270 ohm current limit resistors. Pulled up to +5V through 6800 ohm

### GPI INPUTS

Four GPI inputs can be used to recall stored presets

### GPI OUTPUTS

Two GPI outputs (GPI 5 and GPI 6) can provide alarm indication of reference missing, audio missing and audio silence (see SIGNAL CHECKS for more information)

### LOCAL CONTROL

Intuitive board edge interface with two select buttons, shaft encoder and ten character alphanumeric display

### REMOTE CONTROL

Control from integrated control panel on AE frames and remote panel

Statesman Lite allows control from any PC on a network

VisionWeb Control is available via the web server on the frame and allows operation using a standard web browser on a PC or tablet

SNMP monitoring and control available as a frame option

### 3G-AIP2 DUAL ANALOGUE AUDIO INPUT PIGGYBACK

#### MECHANICAL

Power consumption: 1.6 Watts

#### AUDIO INPUTS

Two analogue stereo pairs or four mono channels. 24 bit quantising A to Ds. High input impedance (20 kohm) balanced

#### INPUT LEVEL RANGE

0dBFS = +28dBu max / 0dBFS = +12dBu min

Factory set default: 0dBFS = +18dBu or +24dBu by on board link

#### SIGNAL TO NOISE

99dB (+18dBu) rms., 22Hz to 22kHz typ.

### TOTAL HARMONIC DISTORTION

0.004% THD+N rms., 22Hz to 22kHz typ.

### INTERCHANNEL CROSSTALK

-110dB at 1kHz, -90dB at 20kHz, rms., typ.

### 3G-AOP2 DUAL ANALOGUE AUDIO OUTPUT PIGGYBACK

#### MECHANICAL

Power consumption: 1.5 Watts

#### AUDIO OUTPUTS

Two analogue stereo pairs or four mono channels. 24 bit quantising D to As. Low output impedance (66 ohm) balanced

#### INPUT LEVEL RANGE

0dBFS = +28dBu max / 0dBFS = +12dBu min

Factory set default: 0dBFS = +18dBu or +24dBu by on board link

#### SIGNAL TO NOISE

99dB (+18dBu) rms., 22Hz to 22kHz typ.

### TOTAL HARMONIC DISTORTION

0.002% THD+N rms., 22Hz to 22kHz typ.

### INTERCHANNEL CROSSTALK

-110dB at 1kHz, -90dB at 20kHz, rms., typ.

### DIOP4 QUAD DIGITAL AUDIO INPUT AND OUTPUT PIGGYBACK

#### MECHANICAL

Power consumption: 0.9 Watts

#### AUDIO INPUTS AND OUTPUTS

Four 24 bit stereo pairs Software selectable as 110 ohm AES/EBU balanced or 75 ohm AES3-id unbalanced on a per-DIOP4 basis (all four connections have the same impedance)

Front-positioned DIOP4 automatically configured as AES inputs; rear-positioned DIOP4 automatically configured as AES outputs

#### TOTAL HARMONIC DISTORTION

With asynchronous inputs: < 0.0001% (-120dB)

## ORDERING INFORMATION

ADP 310	Audio delay and processor for AES or analogue audio (must fit one audio input piggyback and one audio output piggyback)	Indigo DT	Desk top box with passive front panel for up to two Crystal Vision modules
3G-AIP2	Analogue audio input piggyback (two stereo pairs or four mono)	Indigo DTSE	Desk top box with active front panel featuring smart CPU for up to two Crystal Vision modules
3G-AOP2	Analogue audio output piggyback (two stereo pairs or four mono)	RM47	Single slot frame rear module. Allows maximum number of ADP 310 in frame (12 in 2U, six in 1U, two in desk top box). Suitable for 110 ohm digital audio or analogue audio. Gives access to all audio inputs and outputs
DIOP4	Digital audio input or output piggyback (four stereo pairs)	RM74	Two slot frame rear module. Allows six ADP 310 in 2U, three in 1U and one in desk top box. Suitable for 75 ohm digital audio. Gives access to all audio inputs and outputs
Indigo 2AE	2U frame with active front panel featuring smart CPU and integrated control panel for up to 12 Crystal Vision modules	VisionPanel	3U Ethernet remote control panel with touch screen
Indigo 2SE	2U frame with active front panel featuring smart CPU for up to 12 Crystal Vision modules	VisionWeb Control	VisionWeb web browser control included within frame software
Indigo 1AE	1U frame with active front panel featuring smart CPU and integrated control panel for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1AE-DP	Statesman Lite	PC Control System
Indigo 1SE	1U frame with active front panel featuring smart CPU for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1SE-DP	SNMP	SNMP monitoring and control

Performance and features are subject to change. Figures given are typical measured values. ADP3100115