Crystal Vision

ADCA412

Dual Analogue to Digital Audio Converter

The ADCA412 provides exceptional 24 bit conversion from analogue audio to AES/EBU, giving out clear, noise-free audio.

With two independent channels this space-saving 100mm x 266mm module fits 24 converters in 2U, at a price comparable to other single channel products.

The ADCA412 is ideal for any environment where you need to convert from analogue to 75 ohm or 110 ohm digital audio, especially multi-channel applications.

- Dual channel analogue to digital audio converter
- 24 bit AES/EBU outputs (up to four per channel)
- 110 ohm balanced or 75 ohm unbalanced output versions available (by changeable module)
- Excellent noise and distortion figures
- Works with 30kHz to 50kHz sampling rates
- Very stable 48kHz clock generator that can be referenced to video, AES or word clock
- Adjust the audio levels: +12dBu to +28dBu input level for 0dBFS digital output
- Space-saving: 100mm x 266mm module allows 12 ADCA412 in 2U (six in 1U and two in desk top box)
- Flexible control and status monitoring
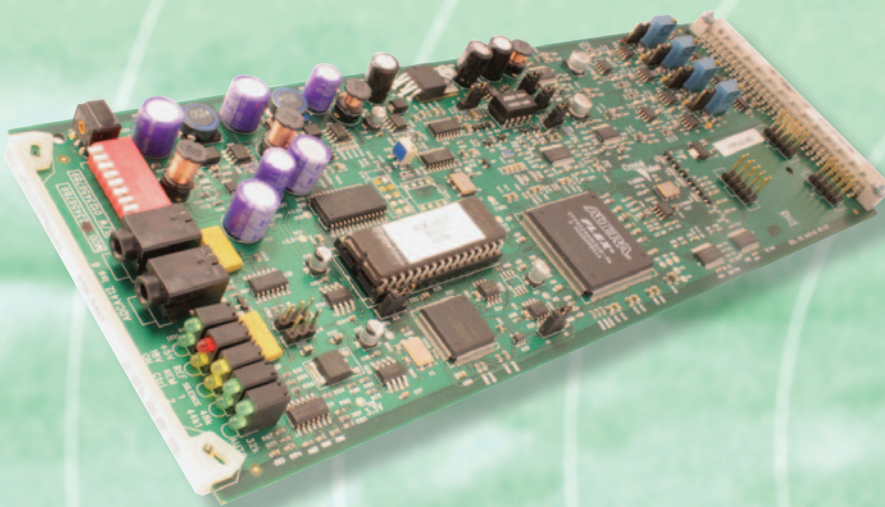
FLEXIBLE DATA RATES AND REFERENCE SOURCES

The ADCA412 can be used with any sampling data rates between 30kHz and 50kHz, with most applications typically involving 48kHz sampling.

It offers the flexibility to take the reference from three different sources: Black & Burst video (48kHz sampling only), another AES feed or word clock.

The crystal controlled phase locked loop ensures an extremely stable clock is generated at 48kHz even when referenced to video, resulting in the best possible performance.

Having the AES locked to video is especially useful for audio which may later be embedded into a video feed.

OUTPUT 75 OHM OR 110 OHM AUDIO

The ADCA412 is available in two versions, with the AES outputs configured as either 110 ohm balanced or 75 ohm unbalanced depending on which OPAES output module is fitted.

ADJUST THE AUDIO LEVEL

Analogue audio input levels are preset to give either +18dBu or +24dBu for 0dBFS digital (the most common audio levels within television stations), or can be continuously adjusted from +12dBu to +28dBu.

USEFUL FEATURES

Powerful features include a channel swap function allowing channels 1 and 2 to be transposed, while the phase of the right hand channel can be inverted to correct phasing errors.

Should multiple outputs from a single stereo input be required, there is an option to convert to single channel operation.

Listening to each incoming analogue stereo pair is quick and easy: just insert headphones into the jack at the front of the board.

SAVE RACK SPACE – AND GET A CHOICE OF OUTPUTS

The ADCA412 is a space-saving 100mm x 266mm module which is housed alongside any other product in the standard Indigo frames – available in 2U, 1U and desk top box sizes – with up to 12 boards (24 channels) fitting in 2U.

The choice of five frame rear modules means you can choose the outputs you need for your application.

The RM03 and RM11 rear modules give four 110 ohm AES outputs per channel. The RM13 rear module gives three 75 ohm AES outputs per channel with a Black and Burst loop-through, the RM14 four 75 ohm AES outputs per channel with a Black and Burst loop-through and the RM21 two 75 ohm AES outputs per channel.

THE INPUTS AND OUTPUTS
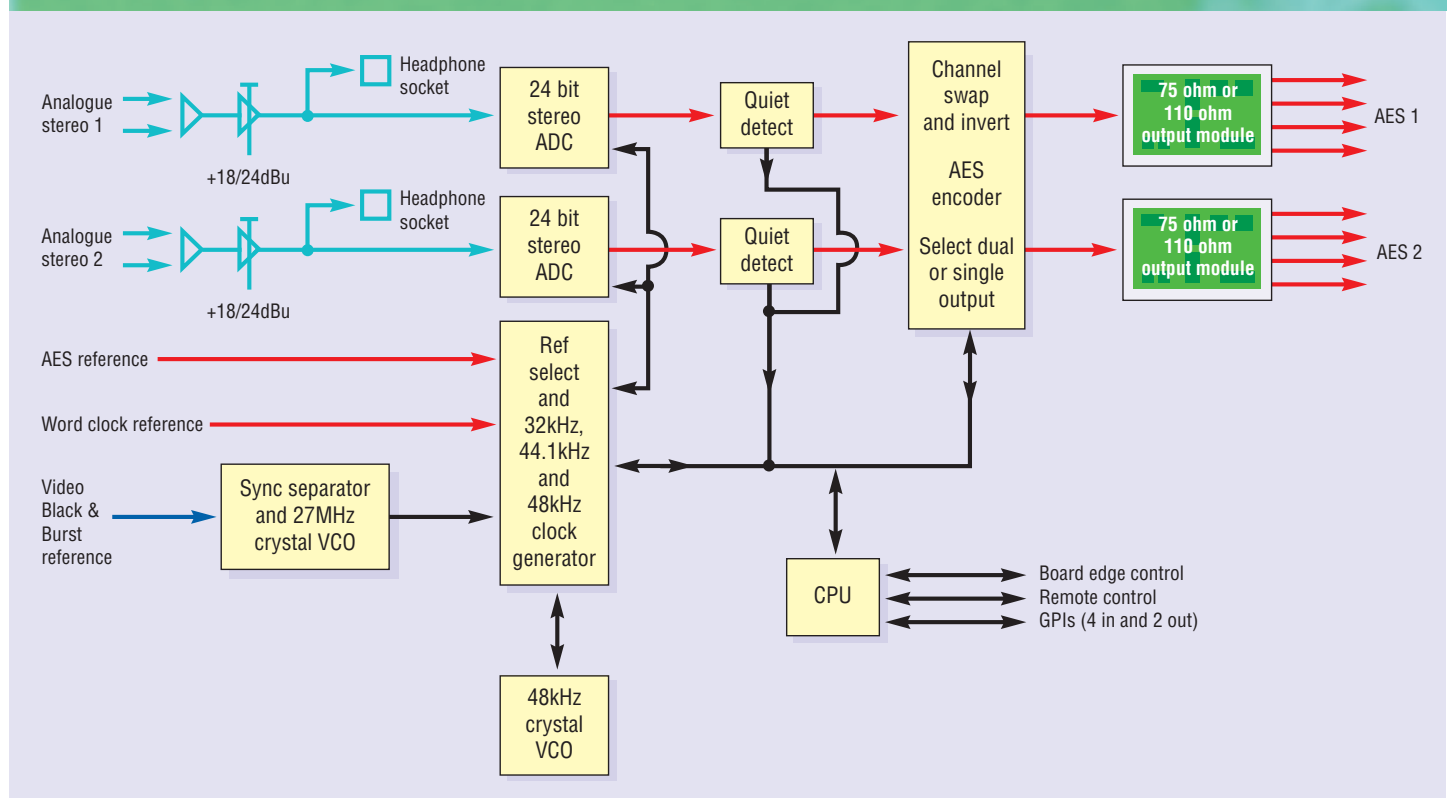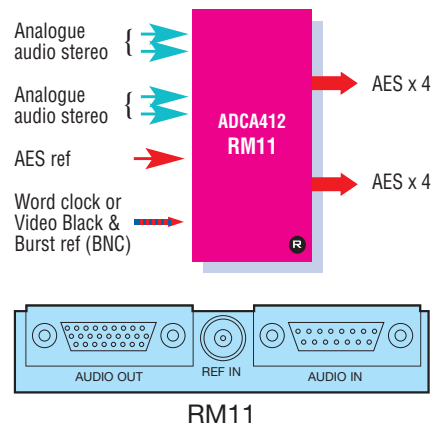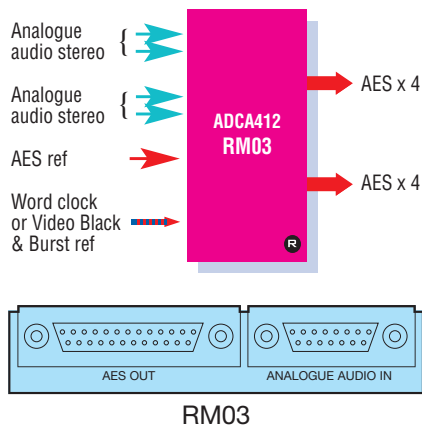
FLEXIBLE CONTROL

Control and status monitoring on the ADCA412 is flexible and sophisticated. Options include board edge, an integrated control panel on the AE frame, the VisionPanel remote control panel, SNMP, our ASCII and JSON protocols, the Statesman Lite PC Control System or the VisionWeb web browser control.

GPI functionality is especially useful, with available warnings including sustained silence – ideal for continuous feeds. The duration of silence before a warning is given can be programmed from 1.5 to 120 seconds in eight second steps.
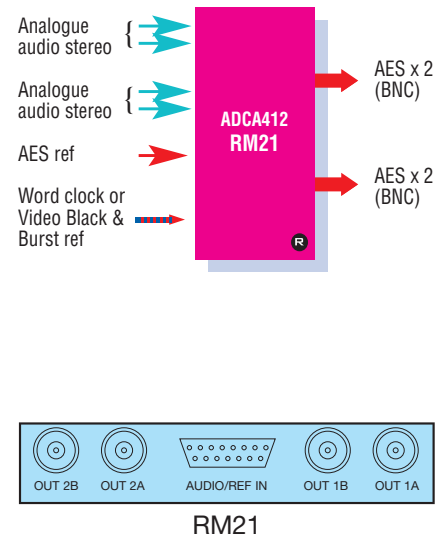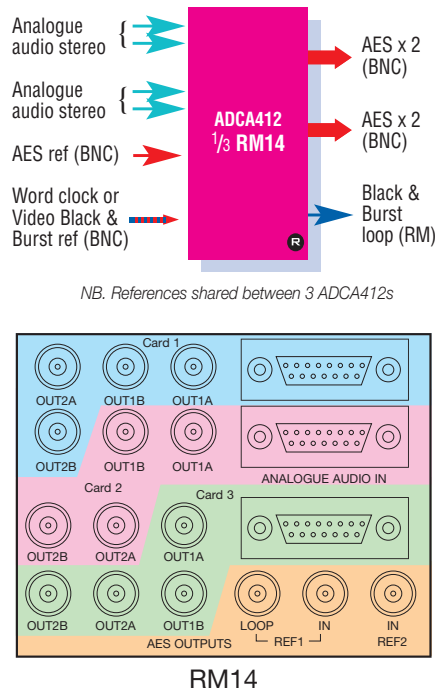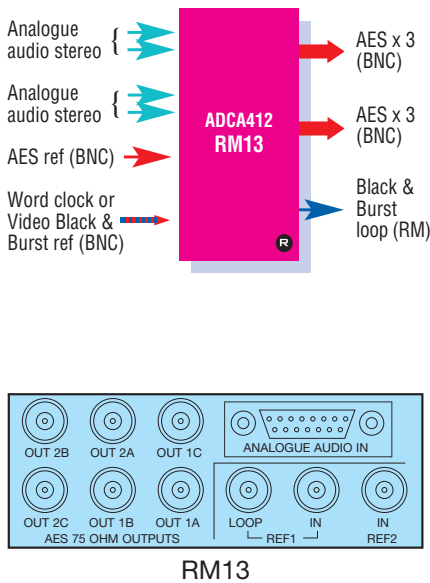
REAR MODULE CONNECTIONS

For 110 ohm AES outputs:

RM03

Analogue audio stereo
Analogue audio stereo
AES ref
Word clock or Video Black & Burst ref

ADCA412 RM03

AES x 4
AES x 4

AES OUT   ANALOGUE AUDIO IN

RM03

RM11

Analogue audio stereo
Analogue audio stereo
AES ref
Word clock or Video Black & Burst ref (BNC)

ADCA412 RM11

AES x 4
AES x 4

AUDIO OUT   REF IN   AUDIO IN

RM11

For 75 ohm AES outputs:

Analogue audio stereo
Analogue audio stereo
AES ref (BNC)
Word clock or Video Black & Burst ref (BNC)

ADCA412 RM13

AES x 3 (BNC)
AES x 3 (BNC)
Black & Burst loop (RM)

Analogue audio stereo
Analogue audio stereo
AES ref (BNC)
Word clock or Video Black & Burst ref (BNC)

ADCA412 $1/3$ RM14

AES x 2 (BNC)
AES x 2 (BNC)
Black & Burst loop (RM)

NB. References shared between 3 ADCA412s

Analogue audio stereo
Analogue audio stereo
AES ref
Word clock or Video Black & Burst ref

ADCA412 RM21

AES x 2 (BNC)
AES x 2 (BNC)

OUT 2B   OUT 2A   OUT 1C   ANALOGUE AUDIO IN
OUT 2C   OUT 1B   OUT 1A   LOOP   IN   IN
                              REF1   REF2
AES 75 OHM OUTPUTS

RM13

Card 1
OUT2A   OUT1B   OUT1A
OUT2B   OUT1B   OUT1A   ANALOGUE AUDIO IN
Card 2
OUT2B   OUT2A   OUT1A
Card 3
OUT2B   OUT2A   OUT1B   LOOP   IN   IN
                          REF1   REF2
AES OUTPUTS

RM14

OUT 2B   OUT 2A   AUDIO/REF IN   OUT 1B   OUT 1A

RM21

SPECIFICATION

MECHANICAL

Standard Crystal Vision module 266mm x 100mm

Weight: 200g

Power consumption: 6.25 Watts

AUDIO INPUTS

Two analogue stereo inputs

High impedance input (>20 kohm)

Level range: 0dBFS = +28dBu max; 0dBFS = +12dBu min

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

Reference input: Analogue video Black & Burst or mixed syncs for 48kHz sampling. AES reference or word clock for 32kHz, 44.1kHz or 48kHz sampling

48kHz clock will be regenerated, 32kHz and 44.1kHz taken directly from reference

AUDIO OUTPUTS

Maximum of four 24 bit stereo outputs per channel (two outputs with frame rear modules RM14 and RM21, three with RM13 and four with RM03 and RM11)

AES3 110 ohm (balanced) D-Type or AES3-id 75 ohm (unbalanced) BNC. Order version required by selecting OPAES-110 or OPAES-75 output module

Reference rear module loop-through available on RM13 and RM14 - loop does not need ADCA412 to be fitted as rear module has passive circuitry required

Can convert to single channel operation if extra outputs from single input required

Works with any sampling rates between 30kHz and 50kHz, usually 32, 44.1 and 48kHz sampling

Signal to noise: Weighted better than -98dB

Total Harmonic Distortion (THD): <.005% at +18dBu/+24dBu with 48kHz sampling

Interchannel crosstalk: <-110dB

Frequency response: +/- 0.1dB 20Hz to 20kHz

DELAY THROUGH BOARD

100ns

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

Mono input repeat on stereo outputs

Swap channels 1 and 2

Reference select (two GPIs select video, AES or word clock)

GPI OUTPUTS

Loss of reference or sustained silence (one output for each analogue stereo input)

Set period of silence before indication from 1.5 to 120 seconds in 8 second increments

LED INDICATION OF:

Power supplies

Clock reference

Audio silent

LOCAL CONTROL

Options and silence indication delay set by switches at board edge

REMOTE CONTROL

Software:

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

Statesman Lite allows control from any PC on a network

SNMP monitoring and control available as a frame option

Control using ASCII and JSON protocols

Hardware:

Control from integrated control panel on Indigo 1AE-DP frame

Control from VisionPanel 3U remote panel

ORDERING INFORMATION

ADCA412	24 bit dual analogue to AES/EBU audio converter. Requires OPAES output module
OPAES-75	75 ohm AES output module
OPAES-110	110 ohm AES output module
Indigo 2SE	2U frame with active front panel featuring smart CPU for up to 12 Crystal Vision modules
Indigo 1AE-DP	1U frame with active front panel featuring smart CPU and integrated control panel for up to six Crystal Vision modules, with included power supply redundancy
Indigo 1SE-DP	1U frame with active front panel featuring smart CPU for up to six Crystal Vision modules, with included power supply redundancy
Indigo DT	Desk top box with passive front panel for up to two Crystal Vision modules
Indigo DTSE	Desk top box with active front panel featuring smart CPU for up to two Crystal Vision modules
RM03	Single slot frame rear module. Allows maximum number of ADCA412 in frame (12 in 2U, six in 1U, two in desk top box). Gives access to four 110 ohm AES outputs per channel
RM11	Single slot frame rear module. Allows maximum number of ADCA412 in frame (12 in 2U, six in 1U, two in desk top box). Gives access to four 110 ohm AES outputs per channel
RM13	Two slot frame rear module. Allows six ADCA412 in 2U, three in 1U and one in desk top box. Gives access to three 75 ohm AES outputs per channel and a rear module Black and Burst loop-through
RM14	Four slot frame rear module. One rear module used for three ADCA412, allowing nine ADCA412 in 2U. Gives access to two 75 ohm AES outputs per channel and a rear module Black and Burst loop-through
RM21	Single slot frame rear module. Allows maximum number of ADCA412 in frame (12 in 2U, six in 1U, two in desk top box). Gives access to two 75 ohm AES outputs per channel
VisionPanel	3U Ethernet remote control panel with touch screen
VisionWeb Control	VisionWeb web browser control included within frame software
Statesman Lite	PC Control System
SNMP	SNMP monitoring and control

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