Crystal Vision

ADDEC-210

Decoding Converter

The ADDEC-210 12 bit decoding converter provides an excellent way to bring any analogue sources into a digital environment.

Used with sources generated by cameras, tape machines, DVD players or graphics generators, it can convert different analogue signals (PAL/NTSC composite, Y/C, YUV or RGB) to SDI, making it ideal for multiple applications and resulting in reductions in cost and rack space. ADDEC-210 has been designed to work both with RGB which has integrated syncs and RGB with separate syncs, which adds further flexibility. Input sources can be of any quality from full broadcast to VHS, with jittery signals accepted.

Performance is excellent, thanks to data sampled at 54Mbit per second allowing the highest quality digital filtering, as well as the five line comb decoder and the 12 bit A to D which reduces quantising noise. The internal video proc-amp allows adjustment of gains and levels for further picture improvements.

continued overleaf

- **12 bit broadcast decoding converter with framestore synchroniser**
- **Converts different analogue signals (PAL/NTSC composite, Y/C, YUV or RGB) to SDI**
- **Exceptional performance: high quality digital filtering, five line comb and gains and levels adjustment**
- **Suitable for all sources, from broadcast quality to VHS**
- **Synchroniser allows untimed inputs to be timed to local syncs**
- **Full vertical and horizontal timing adjustment (0-2 fields)**
- **Fixed delay of up to two fields can be added in absence of reference**
- **Audio follow pulse**
- **Save rack space: 100mm x 266mm module allows 12 ADDEC-210 in 2U (six in 1U and two in desk top box)**
- **Flexible control: select from front and remote panels, GPIs, SNMP or web browser**

continued from page 1

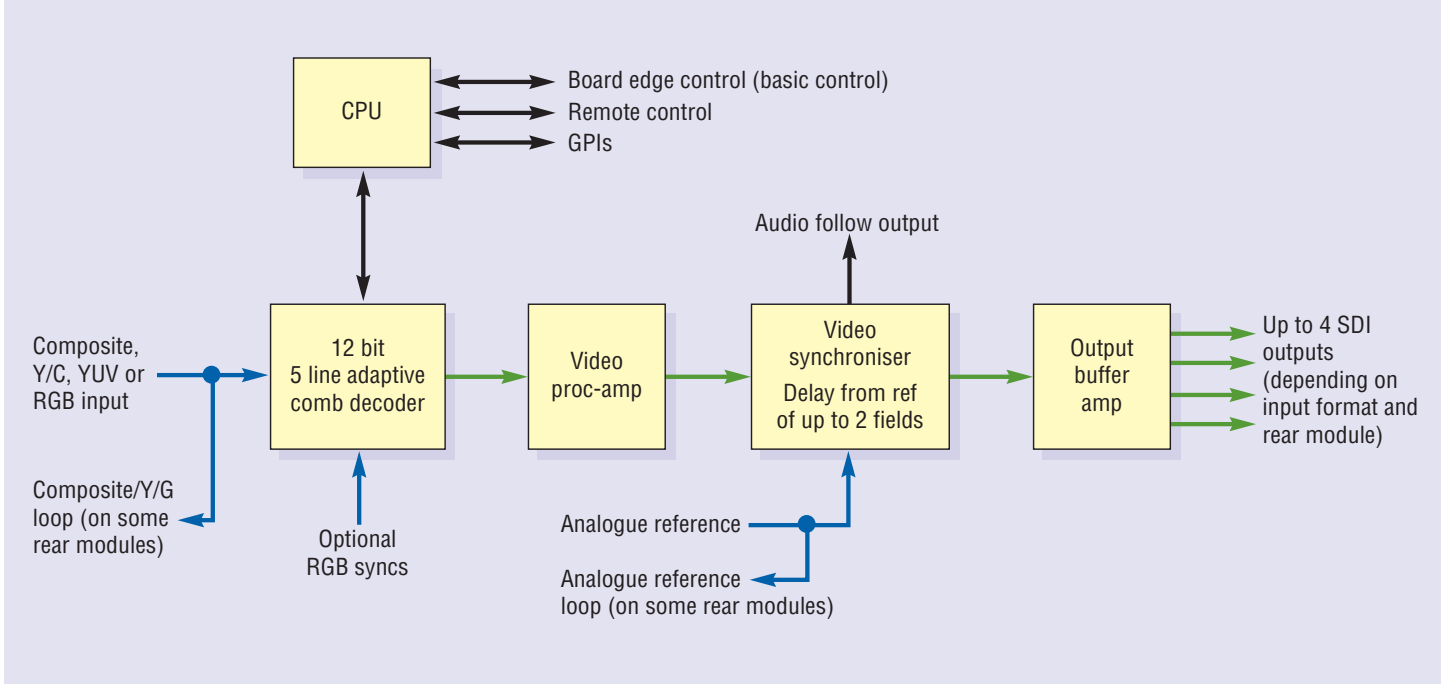
ADDEC-210 includes a synchroniser which allows untimed inputs to be timed to the local syncs. This will fix any incorrect frame rates as well as any delays by taking its timing from the external analogue reference, automatically synchronising sources between 0 and 2 fields. The output timing can also be vertically offset with respect to the reference by any number of lines up to a whole frame. In the absence of a reference, ADDEC-210 can operate in delay mode where timing is derived from the analogue input, with the addition of a fixed delay of up to two fields to compensate for the processing delays. An audio follow pulse allows ADDEC-210 to be used with an external tracking audio delay, and means that an audio delay can track the video delay through the board.

The picture can be frozen, allowing ADDEC-210 to extend its functionality and be used as a simple still store. The ability to select NTSC Betacam chrominance levels for YUV inputs – giving 700mV for 75% colour bars instead of the standard 700mV for 100% bars – increases the range of systems with which it can be used. Data in the blanking interval of the composite input can be blanked or passed, while the current board settings can be saved in one of 16 locations to be recalled as required.

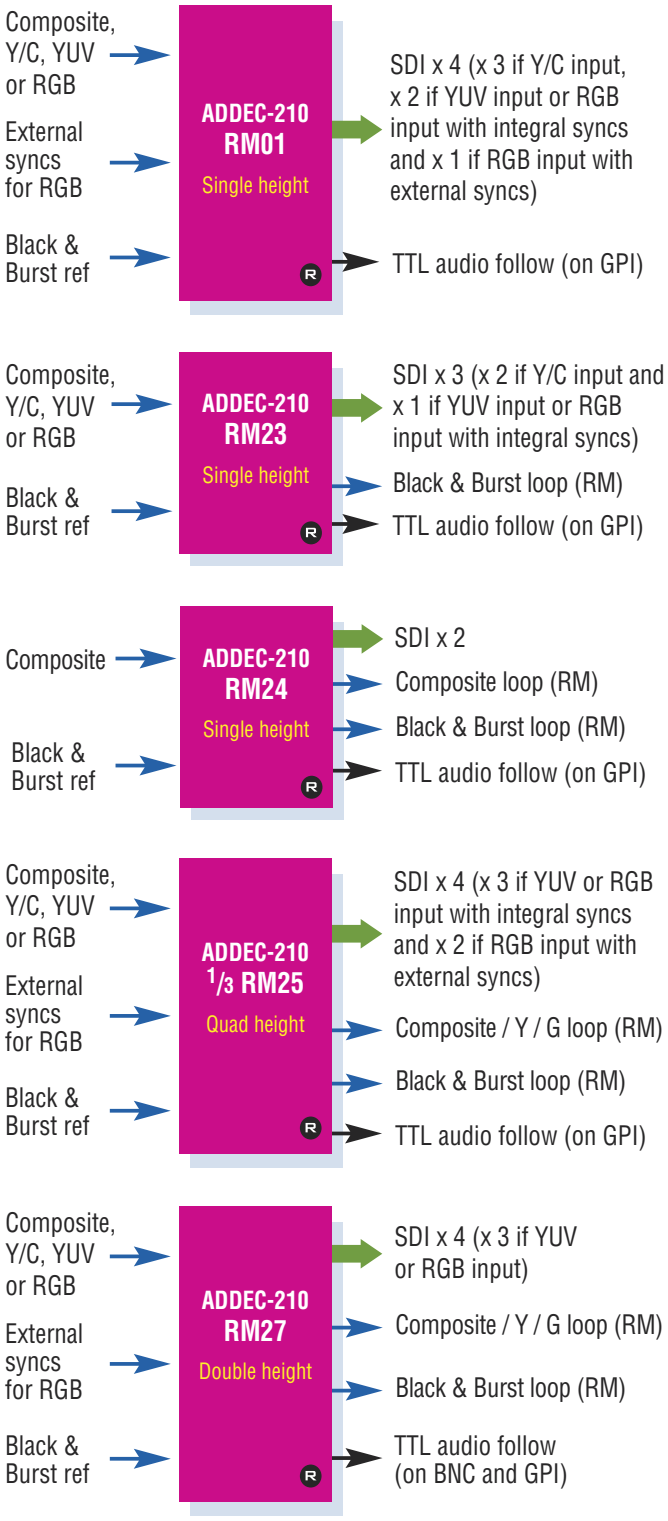
The 100mm x 266mm module fits in Crystal Vision's standard frames allowing it to be freely mixed with any product from the range. Taking up very little space, 12 boards can be housed in 2U, six in 1U or two in a desk top box. Five different frame rear modules (RM01, RM23, RM24, RM25 and RM27) mean you can configure just the outputs you need, with a maximum of four SDI available, dependent on the input format and the rear module fitted. An input loop-through is available on the RM24, RM25 and RM27, while you can distribute your reference by using the Black and Burst loop available on all rear modules except the RM01.

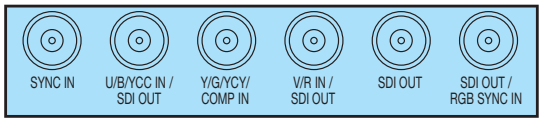
Simple board edge control allows the selection of the input format, pedestal setting, Betacam levels, passing or blanking of the VBI, synchroniser or delay mode and control type via piano switches. The output timing can additionally be adjusted by using a shaft encoder. All other adjustments (including gains and levels) must be done remotely, using an integrated control panel on the AE frame, the VisionPanel remote control panel, SNMP, our ASCII and JSON protocols, the Statesman Lite PC software or the VisionWeb web browser control.

THE INPUTS AND OUTPUTS

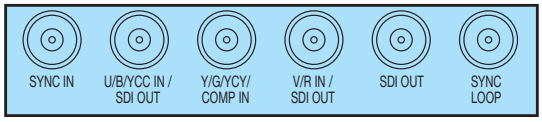


REAR MODULE CONNECTIONS

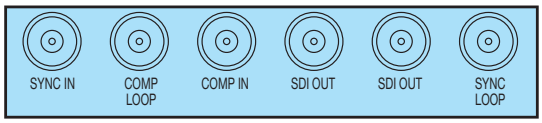




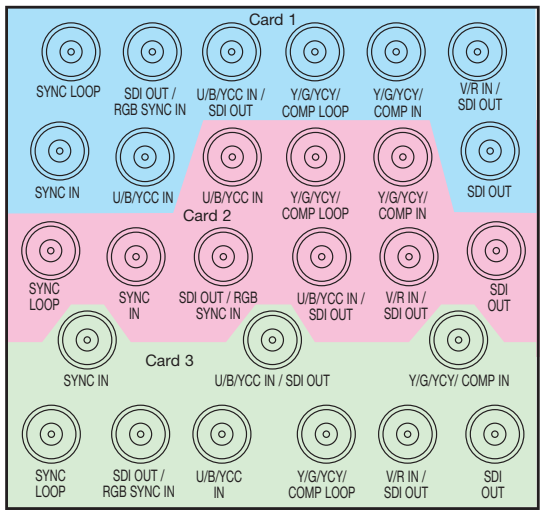
RM01



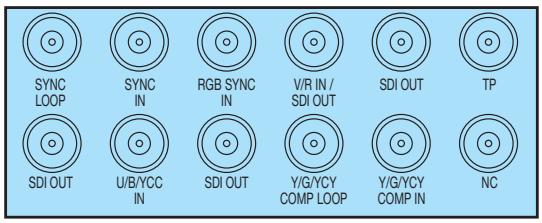
RM23



RM24



RM25



RM27

SPECIFICATION

MECHANICAL

Standard Crystal Vision module 266mm x 100mm

Weight: 200g

Power consumption: 6 Watts

VIDEO INPUT

Composite, Y/C, YUV or RGB component video input, 1 volt with syncs (Composite input only with RM24 frame rear module)

PAL and NTSC Y/C

Switchable Betacam levels on YUV input

Can accept RGB input with integral sync pulses on all three components, on green only or no syncs. Should the video not have syncs present, an RGB external syncs input is available on the RM01, RM25 and RM27 rear modules

625 line PAL or 525 line NTSC

VIDEO OUTPUTS

270Mb/s to EBU 3267-E and SMPTE 259 with inserted EDH

Maximum of four SDI outputs depending on the input format and the rear module fitted:

- Single height RM01 gives four outputs with composite input, three outputs with Y/C input, two outputs with YUV input or RGB input with integral syncs, and one output if RGB input with external syncs
- Single height RM23 gives three outputs with composite input, two outputs with Y/C input and one output with YUV input or RGB input with integral syncs
- Single height RM24 gives two outputs (composite input only)
- Quad height RM25 gives four outputs with composite or Y/C input, three outputs with YUV input or RGB input with integral syncs and two outputs if RGB output with external syncs
- Double height RM27 gives four outputs with composite or Y/C input and three outputs with YUV input or RGB input (with or without integral syncs)

Black and Burst rear module loop-through available when using RM23, RM24, RM25 and RM27 – loop does not need ADDEC to be fitted as rear module has all circuitry required

Composite rear module loop-through available when using RM24; composite or Y or G rear module loop-through available when using RM25 or RM27 – loop does not need ADDEC to be fitted

<500ps 1kHz jitter and <800ps broadband jitter from stable 300mV Black and Burst reference

ANALOGUE REFERENCE

Analogue Black and Burst, mixed syncs or video reference

Amplitude of syncs 150mV to 4V

Link on PCB selects 75 ohm termination or high impedance for loop-through

AUDIO FOLLOW OUTPUT

TTL output (0.7V to 5V). On BNC (RM27 only) or available from the D-Type on rear of frame. Pulse length shows delay through store (0 to 40mS)

ANALOGUE PERFORMANCE

12 bit precision 54Mbit (four times oversampling)

Exceptional performance is achieved by a 12 bit five line adaptive comb decoder

Frequency response: +/- 0.5dB to 5.5MHz

Differential phase and gain <1.5°, <1.5%

Signal to Noise: > 60dB

Blanking: To analogue PAL/NTSC specifications, with selectable VBI blanking PAL lines 7 to 22 and 319 to 335. NTSC lines 10 to 20 and 273 to 282

VIDEO TIMING ADJUSTMENTS

With a video timing reference the timing of the output (with respect to the reference in) may be adjusted by any number of lines up to a whole video frame. Horizontal timing adjustment is also possible in 37ns steps

With no video timing reference the delay from input to output is set by the same timing adjustments

DELAY THROUGH BOARD

3 lines min – 2 fields + 3 lines max

FREEZE FUNCTIONS

Manual freeze allows the ADDEC to be used as a simple still store. Selecting single field output can counteract any flicker caused by the interlacing of two fields. Either field can be selected

VIDEO GAIN AND LEVEL ADJUSTMENTS

Luma gain

Chroma gain

U gain

V gain

Black level

Chroma phase (NTSC hue)

Adjustable either locally or remotely

LED INDICATION OF:

Analogue input present

Analogue reference present

Power supplies okay

Store frozen

GPI INPUT LEVELS

Electrically: Will tolerate 0V to 30V, pulled up to +5V through 10 kohm

GPI OUTPUT LEVELS

Electrically: Open collector transistors 30V, 220 ohm current limit resistors. Pulled up to +5V through 10 kohm

GPI INPUTS

Four GPI inputs can recall presets 1 to 16

GPI OUTPUTS

Video input present

Audio follow output

LOCAL CONTROL

Basic board edge control

Piano switches select:

Input format (composite, Y/C, YUV or RGB)

Pedestal on/off

Normal/Betacam levels (525 YUV only)

VBI passed/blanked

Synchroniser mode/delay mode

Board edge/remote control

ADDEC-210 uses a shaft encoder to adjust delay or output timing

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

ADDEC-210	12 bit PAL/NTSC, Y/C, YUV or RGB to SDI decoding converter with framestore and output timing adjustment
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
RM01	Single slot frame rear module. Allows maximum number of ADDEC-210 in frame (12 in 2U, six in 1U, two in desk top box). Gives access to four SDI outputs (three if Y/C input, two if YUV input or RGB input with integral syncs and one if RGB input with external syncs)
RM23	Single slot frame rear module. Allows maximum number of ADDEC-210 in frame (12 in 2U, six in 1U, two in desk top box). Gives access to three SDI outputs (two if Y/C input and one if YUV input or RGB input with integral syncs) and a Black and Burst rear module loop-through
RM24	Single slot frame rear module. Allows maximum number of ADDEC-210 in frame (12 in 2U, six in 1U, two in desk top box). Composite only input. Gives access to two SDI outputs and both Black and Burst and composite rear module loop-throughs
RM25	Four slot frame rear module. One rear module used for three ADDEC-210, allowing nine ADDEC-210 in 2U. Gives access to four SDI outputs (three if YUV input or RGB input with integral syncs and two if RGB input with external syncs), a Black and Burst rear module loop-through, and a composite, Y or G rear module loop-through
RM27	Two slot frame rear module. Allows six ADDEC-210 in 2U, three in 1U and one in desk top box. Gives access to four SDI outputs (three if YUV or RGB input), a Black and Burst rear module loop-through, a composite, Y or G rear module loop, and a TTL audio follow
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

Crystal Vision

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