Crystal Vision

Decoding Converters

The ADDEC 12 bit decoding converters provide 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, these flexible boards can convert different analogue signals (PAL/NTSC composite, Y/C, YUV and RGB) to SDI - making them ideal for multiple applications and resulting in reductions in both cost and rack space.

The ADDEC-310 is for people who like full board edge control and offers the most features of the two boards. Ideal for the more budget-sensitive systems, the lower cost ADDEC-210 has simple board edge functionality, and has been designed for engineers happiest using remote control.

Input sources can be of any quality from full broadcast to VHS, with jittery signals accepted. The ADDECs have been designed to work both with RGB which has integrated syncs and RGB with separate syncs, which adds further flexibility.

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.

Both boards include 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 the ADDECs 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 any processing delays. An audio follow pulse allows the boards 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 the ADDECs to extend their 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 they can be used. Data in the vertical 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.

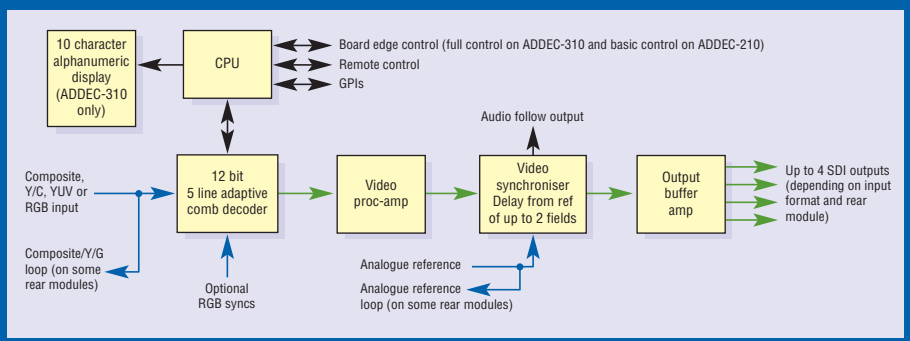
ADDEC-310 gives the most flexible control of the two, with any adjustments available at the board edge as well as remotely. There are an extensive set of board edge controls allowing the adjustment of levels and gains along with other options, with the inclusion of a ten character alphanumeric display making diagnosis and adjustment easy. ADDEC-210 has simple board edge control, allowing 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. The remote control options available for the two ADDECs include an active front panel on the frame, a remote control panel and the Statesman PC software.

The 100mm x 266mm modules fit in Crystal Vision's standard frames allowing them to be freely mixed with any product from the range. Taking up very little space, 24 boards can be housed in 4U, 12 in 2U, six in 1U or two in a desk top box. Five different frame rear modules (the RM01, RM23, RM24, RM25 and RM27) mean you can configure just the outputs you need, with a maximum of four SDI outputs available. 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.

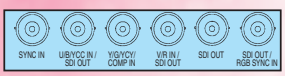
Choose ADDEC-210 when... you're working on a budget-sensitive big system and you're happy using remote control.

Choose ADDEC-310 when... you want all the features and you prefer the hands-on approach of full board edge control.

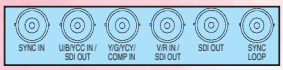
- 12 bit decoding converters, available in two versions
- Save money and rack space: convert any analogue signals to SDI
- Convert PAL/NTSC composite, Y/C, YUV and RGB (with integral or separate syncs)
- Suitable for all sources, from broadcast quality to VHS
- Exceptional performance: high quality digital filtering and five line comb
- Gains and levels adjustment
- On-board 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 output
- Space-saving: 100mm x 266mm module allows 12 decoding converters in 2U (24 in 4U, six in 1U and two in desk top box)
- Flexible control, including PC software



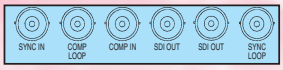
SPECIFICATION



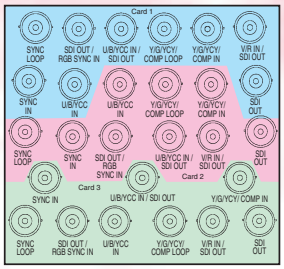
RM01



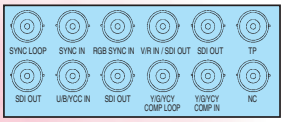
RM23



RM24



RM25



RM27

MECHANICAL
Standard Crystal Vision modules 266mm x 100mm
Weight: 200g
Power consumption: 6.5 Watts

ANALOGUE INPUT
Composite, Y/C or YUV/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

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

VIDEO OUTPUTS
SDI 270Mbit to EBU 3267-E and SMPTE 259M 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 input 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

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 ADDECs 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 remotely with ADDEC-210, and either locally or remotely on ADDEC-310

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

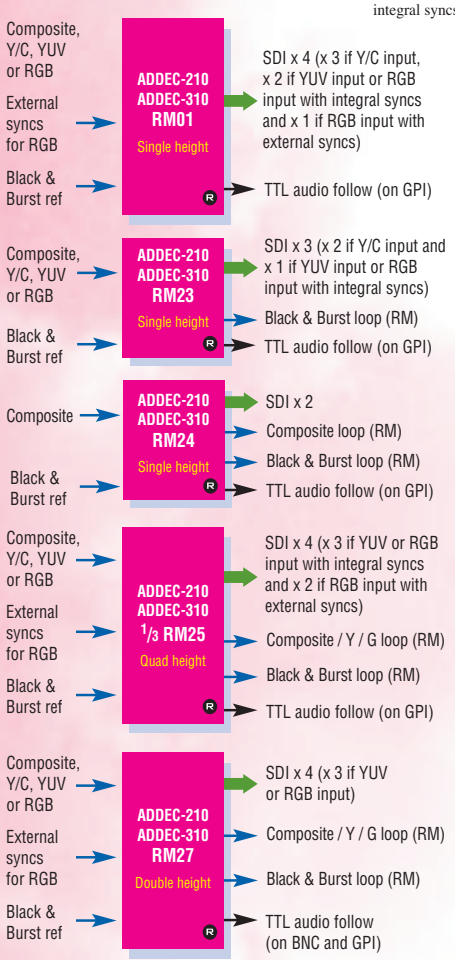
GPI INPUTS
Four GPI inputs can recall presets 1 to 16

GPI OUTPUTS
Video input present
Audio follow output

LOCAL CONTROL
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
ADDEC-310 uses a shaft encoder to access menus for a number of functions using the aid of a ten character alphanumeric display. These include adjustment of video gains and levels

REMOTE CONTROL
Control from frame active front panel and remote panel
Statesman allows control from any PC on a network. Four Statesman menu tabs available: Video properties, Presets, Gains and Factory Reset



ORDERING INFORMATION

ADDEC-310	12 bit PAL/NTSC, Y/C, YUV or RGB to SDI decoding converter with framestore, output timing adjustment and full board edge control
ADDEC-210	12 bit PAL/NTSC, Y/C, YUV or RGB to SDI decoding converter with framestore and output timing adjustment
Indigo 4	4U frame with passive front panel for up to 24 Crystal Vision modules
Indigo 4SE	4U frame with passive front panel fitted with Statesman CPU for up to 24 Crystal Vision modules
Indigo 2	2U frame with passive front panel for up to 12 Crystal Vision modules
Indigo 2AE	2U frame with active front panel for up to 12 Crystal Vision modules
Indigo 2SE	2U frame with passive front panel fitted with Statesman CPU for up to 12 Crystal Vision modules
Indigo 1	1U frame with passive front panel for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1-DP
Indigo 1AE	1U frame with active front panel for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1AE-DP
Indigo 1SE	1U frame with passive front panel fitted with Statesman CPU for up to six Crystal Vision modules. Power supply redundancy available with Indigo 1SE-DP
Indigo DT	Desk top box with passive front panel for up to two Crystal Vision modules
Indigo DTAE	Desk top box with active front panel for up to two Crystal Vision modules
Indigo DTSE	Desk top box with passive front panel fitted with Statesman CPU for up to two Crystal Vision modules
RM01	Single slot frame rear module. Allows maximum number of ADDEC in frame (24 in 4U, 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 in frame (24 in 4U, 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 in frame (24 in 4U, 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, allowing 18 ADDEC in 4U and nine 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 12 ADDEC in 4U, six 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-through, and a TTL audio follow
REMIND	19" remote control panel
REMIND-E	19" Ethernet remote control panel
Statesman	PC Control System

Performance and features are subject to change. Figures given are typical measured values. ADDEC0308

Crystal Vision

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