Crystal Vision

SYNAD

Embedded Audio Synchroniser

SYNAD124: one unique board which synchronises video and up to two embedded audio groups (eight mono channels) to an analogue reference.

The first synchroniser in the world able to process two groups of audio, SYNAD can be used to eliminate timing problems in serial digital systems and is ideal for video sources containing embedded audio. Audio delay is handled separately from video delay, allowing the video path to drop or repeat frames without noticeably affecting the audio. SYNAD de-embeds the two groups of audio, passes them through a tracking audio delay resampling them, and then re-embeds the audio. The audio and video are delayed by the same amount to ensure they stay correctly timed and lip sync errors are avoided. One versatile board therefore replaces a de-embedder, synchroniser, tracking audio delay and embedder in other systems.

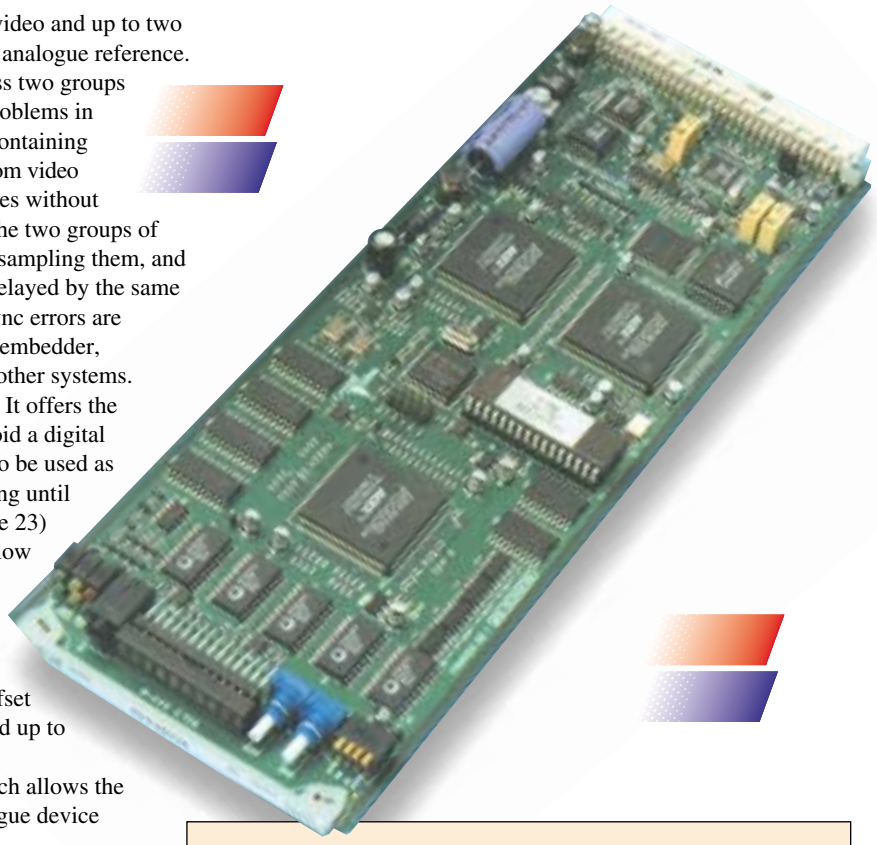
SYNAD has a very short minimum delay of 2us. It offers the choice of black, blue or freeze on input failure to avoid a digital green screen, while manual freeze allows the board to be used as a simple still store. In 625 line applications, by waiting until the last possible moment in the vertical blanking (line 23) to set the vertical position, SYNAD can follow a router without picture disturbance. Other synchronisers lock up from line 1 and therefore a vertical switch at line 6 to a vertically offset picture would not be corrected for a whole field. The user can offset the reference by up to two fields, or can manually add up to two fields of delay when there is no reference.

SYNAD also includes a monitoring encoder which allows the synchroniser to be attached to a non-broadcast analogue device such as a picture monitor.

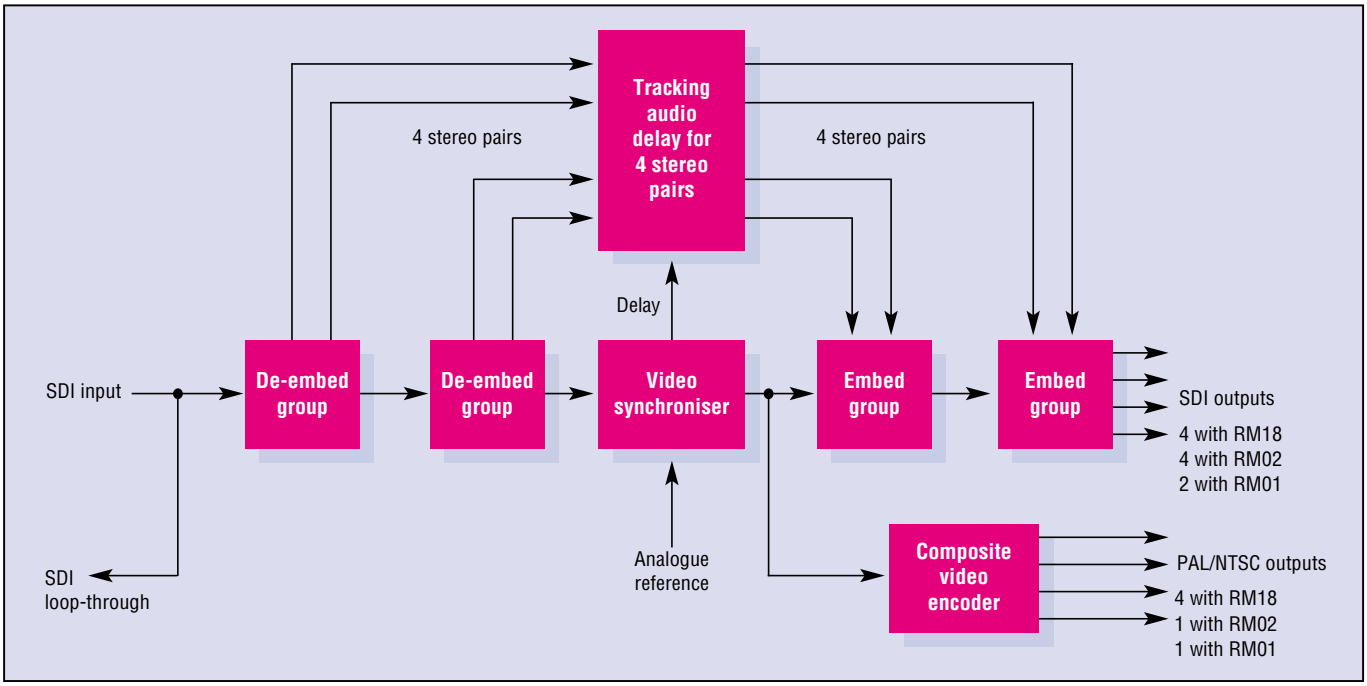
Sophisticated audio processing techniques are incorporated to deal with any interruption to the embedded audio or unusual methods of packing. A headphone socket on the front of the card allows any of the audio signals being synchronised to be monitored.

SYNAD124 can be easily integrated with any of Crystal Vision's full range of modular interface and keying products. It can be used with three frame rear modules (RM01, RM02 and RM18) depending on the outputs required, with the RM18 giving the maximum four SDI and four composite outputs. It can be controlled from either board edge, an active front panel on the frame, a remote control panel or the Statesman PC Control System.

SYNAD124 can be placed anywhere it is needed within a broadcast system - on lines in, after a routing switch where the sources are several lines apart, or in installations using the latest generation of broadcast VTRs which can record up to two groups of embedded audio.



- Digital embedded audio synchroniser
- Delays and resamples two groups of embedded audio independently to video
- Space-saving: 100mm x 266mm module allows 12 SYNADs in 2U (six in 1U and two in desk top box)
- Includes PAL/NTSC monitoring encoder
- Full vertical and horizontal adjustment (0-2 fields)
- Can be used as fixed delay of up to 1 frame
- Minimum delay of 2us
- Selectable black, blue or freeze on input failure
- Corrects any corruption to embedded audio
- Audio follow control output
- Flexible control, including PC software



SPECIFICATION

MECHANICAL
Standard Crystal Vision module 266mm x 100mm
Weight: 200g
Power consumption: 11 Watts

VIDEO INPUTS
SDI 270Mbit to EBU 3267-E and SMPTE 259M
Cable equalisation >200m Belden 8281 or equivalent
Auto 625/525 line selection

SDI OUTPUTS
SDI 270Mbit to EBU 3267-E and SMPTE 259M with inserted EDH
Maximum of four SDI outputs (two outputs with frame rear module RM01 and four with RM02 and RM18)
<500ps 1kHz jitter and <800ps broadband jitter from stable 300mV Black and Burst reference
<500ps 1kHz jitter in delay mode (low frequency jitter follows SDI input in delay mode only)
Active reclocked loop-through provided on second BNC on all rear modules

ANALOGUE VIDEO OUTPUTS
Maximum of four PAL/NTSC composite outputs (one output with frame rear modules RM01 and RM02 and four with RM18)
Frequency response: +/-0.3dB 0 to 5MHz
Noise: <-54dB weighted luminance or chrominance

ANALOGUE REFERENCE
Analogue Black and Burst, mixed syncs or video
Amplitude of syncs 100mV to 4V
Optimum jitter performance is from analogue Black and Burst plus 300mV syncs to EBU N14-1988

VIDEO TIMING ADJUSTMENTS
In synchroniser mode 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
In delay mode the reference is not used and the delay through for the SDI is set by this timing adjustment

AUDIO INPUTS AND OUTPUTS
Two groups of audio in and out

AUDIO TIMING ADJUSTMENTS
The audio is delayed by the same amount as the video
An additional delay can be added to the audio of up to 80ms

AUDIO MONITORING
Select any audio pair to monitor on headphones

LOCAL CONTROL
Board edge with 10 character alphanumeric display

REMOTE CONTROL
RS422/485
19200 baud, 8 bits, 1 stop no parity
Control from frame active front panel and remote panel
Statesman allows control from any PC on a network

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

GPI OUTPUT LEVELS
Electrically : Open collector transistors 30V, 330ohm current limit resistors. Pulled up to +5V through 10kohm

GPI INPUTS
Freeze

GPI OUTPUTS
SDI input present
Analogue reference present
Delay less than 25 lines
Selected audio group missing from input
Audio follow pulse

FREEZE FUNCTIONS
Automatic freeze is available when input fails through loss of signal. The user can specify to show the last good field repeated before picture failure, the whole frame in which failure happened (useful for diagnostic purposes) or a black or blue screen. It can also be selected to freeze the picture for approximately one second and then go to black or blue
Manual freeze allows SYNAD to be used as a simple still store.
Selecting single field output can counteract any flicker caused by the interlacing of the two fields on a picture with significant movement. Either field can be selected. The single field is output only when the picture is frozen

AUDIO FOLLOW OUTPUT
TTL output is provided on the same D-Type as GPIs to indicate the video delay through the synchroniser
The length of the pulse is equal to the delay

LED INDICATION OF:
SDI input present
Analogue reference present
Delay less than 25 lines
Store frozen
Selected audio group missing from input
All power supplies present

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ORDERING INFORMATION

SYNAD124	Synchroniser with tracking audio delay for two groups of embedded audio
FR2AV	2U frame for up to 12 Crystal Vision modules
FR1AV	1U frame for up to six Crystal Vision modules
DTB-AV	Desk top box for up to two Crystal Vision modules
RM01	Single slot frame rear module. Allows maximum number of SYNADs in frame (12 in 2U, six in 1U, two in desk top box). Gives access to two SDI outputs, one PAL/NTSC output and an SDI loop-through
RM02	Four slot frame rear module. One rear module used for three SYNADs, allowing nine SYNADs in 2U (fits in 2U frame only). Gives access to four SDI outputs, one PAL/NTSC output and SDI and Black and Burst loop-throughs
RM18	Two slot frame rear module. Allows six SYNADs in 2U, three in 1U and one in desk top box. Gives access to four SDI outputs, four PAL/NTSC outputs and SDI and Black and Burst loop-throughs
FP2-LF	Active front control panel for 2U frame
FP1-LAV	Active front control panel for 1U frame
FP1-SAV	Active front control panel for desk top box
REM1U	19” remote control panel
REM1US	Narrow 1U remote control panel
Statesman	PC Control System

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