# Crystal Vision

COMPONENT TO SDI CONVERTERS

Crystal Vision offers the choice of three 10 bit ADCs which balance high quality, low cost and an impressive list of features. All have horizontal position adjustment, with timing taken either from an external analogue reference or from the Y or Green signal. Vertical blanking can be switched on or off. Setup on the Y output in 525 line and Betacam chrominance levels can be selected. The three converters have both very low jitter and very low noise, while a high quality digital clamp eliminates dc offset errors. The boards can be controlled manually from board edge or remotely from frame active front panel, remote control panel, the Statesman PC Control System or by using GPI. Flexible outputs are available, with the RM01 frame rear module giving two outputs, the RM02 three outputs plus a syncs loop and the RM18 four outputs with a syncs loop.

ADC104F

The ADC104F converts from RGBS/YUVS analogue component to serial digital and fully meets the ITU 601 specification for filtering, thereby making it suitable for high quality broadcast and multi-pass applications. It can generate full-frame and split-field test patterns for calibrating the system, offering the choice of eight different patterns. It includes an on-board matrix to convert any RGB inputs to YUV. It is ideal for the conversion of component broadcast cameras or tape machines such as Betacam to SDI.
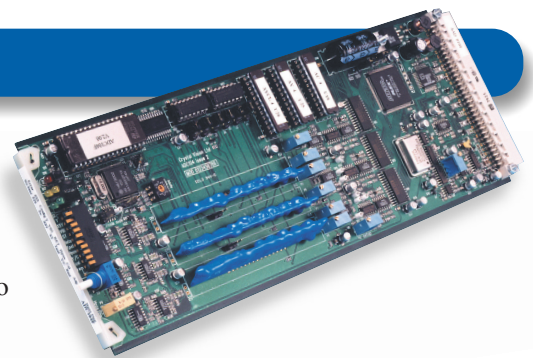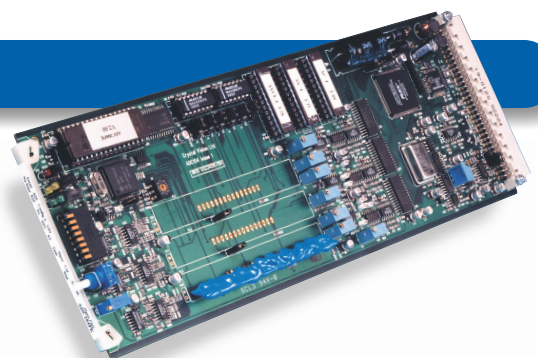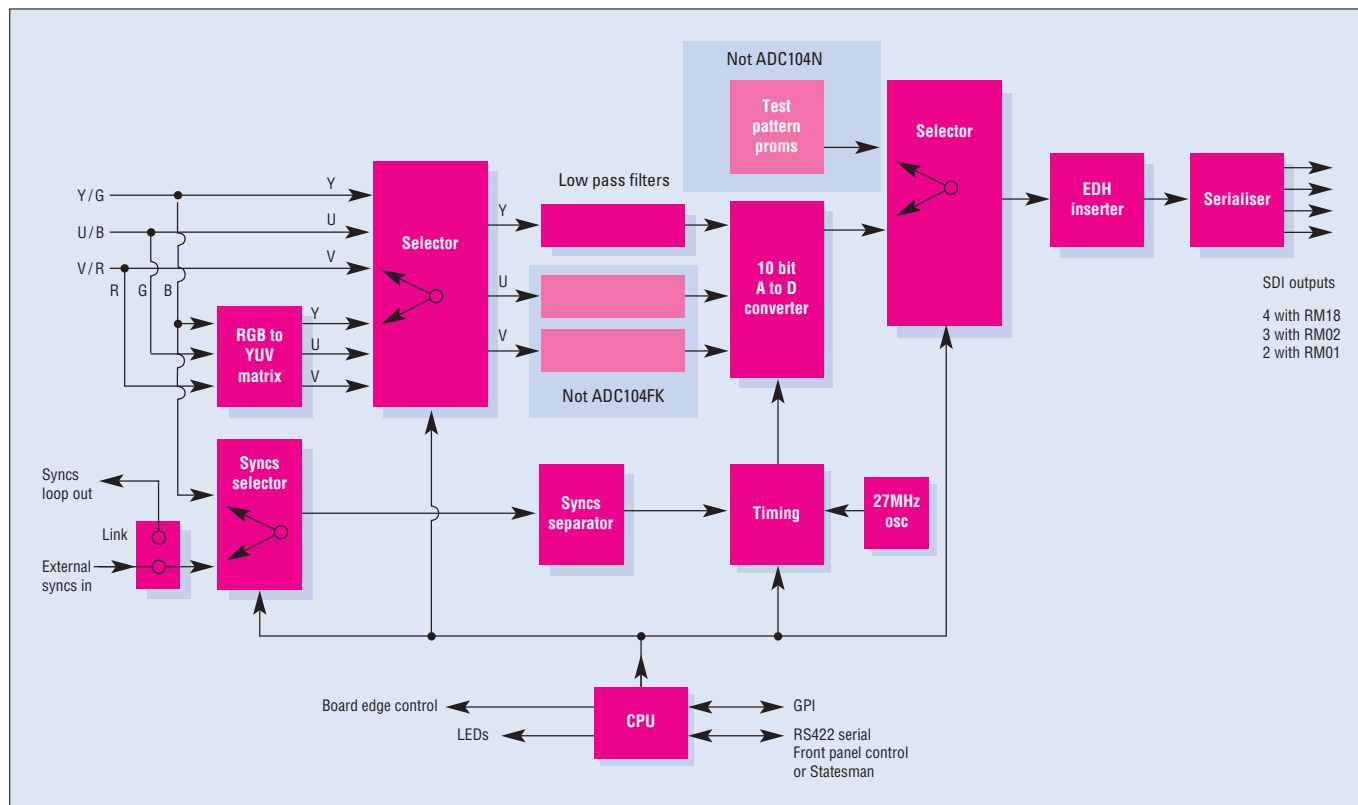

ADC104N

The ADC104N converts from RGBS/YUVS analogue component to serial digital and nearly meets the ITU 601 specification for filtering. It includes an on-board matrix to convert any RGB inputs to YUV. It is ideal for the more cost-sensitive conversion of component broadcast cameras or tape machines such as Betacam to SDI, and also for converting computer graphics cards with component outputs to serial digital.

ADC104FK

The ADC104FK is similar to the ADC104F but only has the Y and syncs inputs, and therefore converts just Y to SDI with full 601 filtering. It is used for luminance only signals, often with character or graphics generators for the key channel.

Not ADC104N

Test pattern proms

Selector

Low pass filters

Selector

EDH inserter

Serialiser

Y/G — Y
U/B — U
V/R — V

R G B

RGB to YUV matrix

Y
U
V

Selector

Y

U

V

Not ADC104FK

10 bit A to D converter

SDI outputs
4 with RM18
3 with RM02
2 with RM01

Syncs loop out

Link

External syncs in

Syncs selector

Syncs separator

Timing

27MHz osc

Board edge control

LEDs

CPU

GPI

RS422 serial
Front panel control
or Statesman

S P E C I F I C A T I O N

MECHANICAL
Standard Crystal Vision modules 266mm x 100mm
Weight: 220g
Power consumption: 5 Watts

ANALOGUE INPUT
YUV and syncs or RGB and syncs 700mV into 75ohm. (Y and Green 1 volt with syncs)
External syncs input can be composite Black & Burst or 2 volt mixed H & V syncs into 75ohm
Link on PCB selects 75ohm termination or high impedance with loop-through (via PCB)
DIL switch selection of YUV/RGB, Setup levels and (ADC104F/N only) Betacam chrominance levels
Auto or manual 625/525 line selection
+/- 2μs adjustment of picture position from syncs
+/- 100nS adjustment in approximately 9nS steps of timing of Y to UV delay (ADC104F/N)

SDI OUTPUTS
270Mbit to EBU 3267-E & SMPTE 259M with EDH
4 outputs with RM18 frame rear module, 3 outputs with RM02 and 2 outputs with RM01
<500ps 1KHz jitter and <800ps broadband jitter from stable 300mV
Black & Burst or mixed syncs reference

ANALOGUE PERFORMANCE
Frequency Response:
Luminance: +/- 0.1dB 0 to 5.75MHz (ADC104F/FK); +/- 0.2dB 0 to 5.75MHz (ADC104N)
Chrominance: +/- 0.1dB 0 to 2.75MHz (ADC104F); +/- 0.2dB 0 to 2.75MHz (ADC104N)
Noise: <-60dB weighted luminance or chrominance (ADC104F/N); <-60dB weighted (ADC104FK)

Gain error: <1%
RGB matrix error: <1%
Chroma/Luma delay inequality: <5ns (ADC104F/N)
Sampled to 10 bit precision at 13.5MHz on Y and 6.75MHz on U and V (ADC104F/N) and at 13.5MHz on luminance input signal (ADC104FK)
Blanking: To 601 specification vertically, with selectable VBI blanking PAL lines 6 to 22 and 319 to 335 and NTSC lines 10 to 20 and 273 to 282

TEST PATTERNS (ADC104F/FK)
8 digital patterns on full screen, or on split screen with incoming video in bottom half
► Ramps
► Edge of Frame Markers
► Frequency Sweep
► Grey
► Multi-frequency Burst
► 100% Colour Bars
► EBU Colour Bars
► SDI Test

BOARD EDGE CONTROL
YUV/RGB input select
Syncs on Y/G or external select
VBI blanking ON/OFF select
Setup ON/OFF select (applies to 525 Standard only)
Betacam chrominance levels ON/OFF select (ADC104F/N)
Test pattern ON/OFF select (ADC104F/FK)
Set Horizontal picture position parameter to factory default values (ADC104FK)

Set Horizontal picture position and/or Y to UV delay parameters to factory default values (ADC104F/N)
Remote/local mode select
Shaft encoder adjustment of Horizontal picture position, Y to UV delay and (ADC104F/FK) test pattern section

REMOTE CONTROL
RS422/485
19200 baud, 8 bits, 1 stop no parity
2 serial ports - 1 connected to frame front panel, 1 can be linked to rear of frame instead of GPI input signals
Front panel control from frame active panel and remote panel
Statesman allows control from any PC on a network

LED INDICATION OF:
Power supplies on board
Lock onto input reference syncs
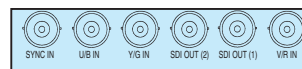625/525 input standard

GPI INPUTS
YUV/RGB input select
Syncs on Y/G or external select
VBI blanking ON/OFF select
Setup ON/OFF select (applies to 525 Standard only)
Betacam chrominance levels ON/OFF select (ADC104F/N)
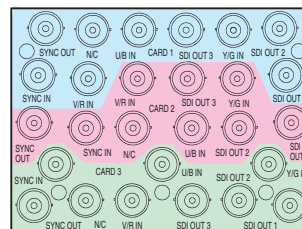Test pattern ON/OFF select (ADC104F/FK)

GPI OUTPUT
Invalid syncs on input

GPI CONTROL
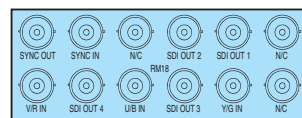Contact-closure inputs to 0V from +5V to +30V
Current-sink outputs. Can drive LED with 330ohm resistor in series from +5V or 12/24V bulb, 50mA max.

SYNC IN U/B IN Y/G IN SDI OUT (2) SDI OUT (1) V/R IN

RM01

SYNC OUT N/C CARD 1 U/B IN Y/G IN SDI OUT 2
SYNC IN V/R IN V/R IN CARD 2 SDI OUT 3 Y/G IN SDI OUT 1
SYNC OUT SYNC IN N/C CARD 3 U/B IN SDI OUT 2 SDI OUT 1
SYNC IN SYNC OUT N/C V/R IN SDI OUT 3 SDI OUT 1

RM02

SYNC OUT SYNC IN N/C SDI OUT 2 SDI OUT 1 N/C
V/R IN SDI OUT 4 U/B IN SDI OUT 3 Y/G IN N/C
RM18

RM18

O R D E R I N G   I N F O R M A T I O N

ADC104F	10 bit RGBS/YUVS to SDI converter with full 601 specification filtering
ADC104N	10 bit RGBS/YUVS to SDI converter with near 601 specification filtering
ADC104FK	10 bit Y to SDI converter with full 601 specification filtering
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 ADCs in frame (12 in 2U, six in 1U, two in desk top box). Gives access to two SDI outputs
RM02	Four slot frame rear module. One rear module used for three ADCs, allowing nine ADCs in 2U (fits in 2U frame only). Gives access to three SDI outputs and syncs loop
RM18	Two slot frame rear module. Allows six ADCs in 2U, three in 1U and one in desk top box. Gives access to all four SDI outputs and syncs loop
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

Performance and features are subject to change. Figures given are typical measured values.   ADC0102