

# Crystal Vision



## Colour Corrector and Legaliser

CoCo104 is designed to be the perfect colour corrector for anyone who wants to adjust the whole picture. This flexible 100mm x 266mm module allows adjustments in both the RGB and YUV colour spaces and is ideal for manipulating the colours in any digital image.

The 10 bit CoCo104 offers independent gain, lift, gamma and soft clip in the RGB domain. The gain and lift tools are used together to effortlessly increase or reduce the red, green or blue individually, allowing CoCo to perform true colour correction. Overall gamma is used to lighten or darken the picture without crushing the blacks or the whites, while independent adjustment of red, green and blue gamma allows extremely sophisticated colour correction and will compensate for camera settings or lighting problems. Legalising is done using the RGB soft clipping function which changes YUV colours illegal in RGB to be valid in RGB, with the level and severity of the clipping specified by the user. CoCo will maintain signal integrity by bypassing the RGB processing on sections of the picture where no legalising or colour correcting occurs.

The YUV adjustment tools on offer include independent lift, independent gain, overall lift and gain, hue phase adjustment, independent YUV adjustable soft clipping, horizontal picture position correction, luminance and chrominance timing adjustments in 74ns steps and adjustable horizontal and vertical cropping.

CoCo provides an auxiliary output which can be connected to a monitor and allows you to preview and perfect any adjustments, by either wiping horizontally or vertically between the processed and unprocessed signal or alternatively switching between input and output. CoCo passes all ancillary data, including embedded audio, without modification. 16 user memories are provided to store user-defined adjustments for easy recall, while there is GPI output indication of RGB and YUV clip status.

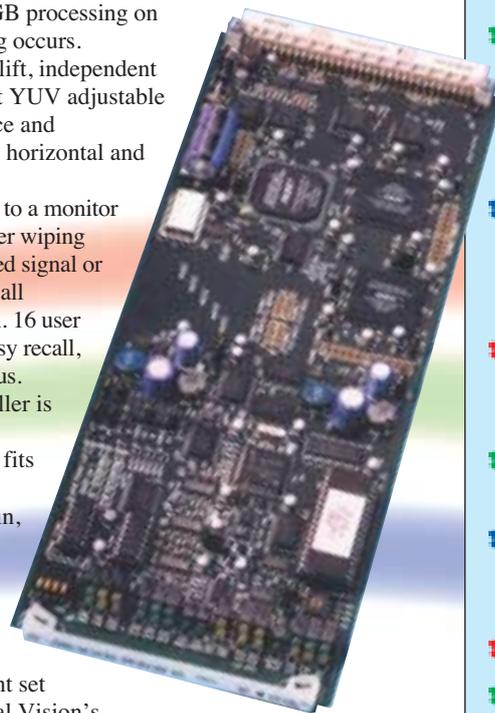
CoCo is exceptionally easy to operate. The CoCo Controller is a dedicated 1U control panel, ideal for live use. Simple and intuitive to operate, it controls up to 12 colour correctors and fits easily into any control desk. It has seven dedicated shaft encoders for the most commonly used adjustments (video gain, chroma gain, black level, red gain, green gain, blue gain and gamma) with the values shown in a display, while other adjustments can be quickly made using shortcut buttons in the centre of the panel. Statesman is available for those who prefer PC control, and allows alarms to be set for out of range inputs, loss of input or loss of board. For a permanent set up, such as for legalising, a frame active front panel or Crystal Vision's general remote control panel are ideal.

The CoCo104 can be easily integrated with any of Crystal Vision's full range of modular interface and keying products. The board fits in the company's four frame sizes (4U, 2U, 1U and desk top box) with the one input, two main outputs and two auxiliary outputs accessed by using the RM01 frame rear module.

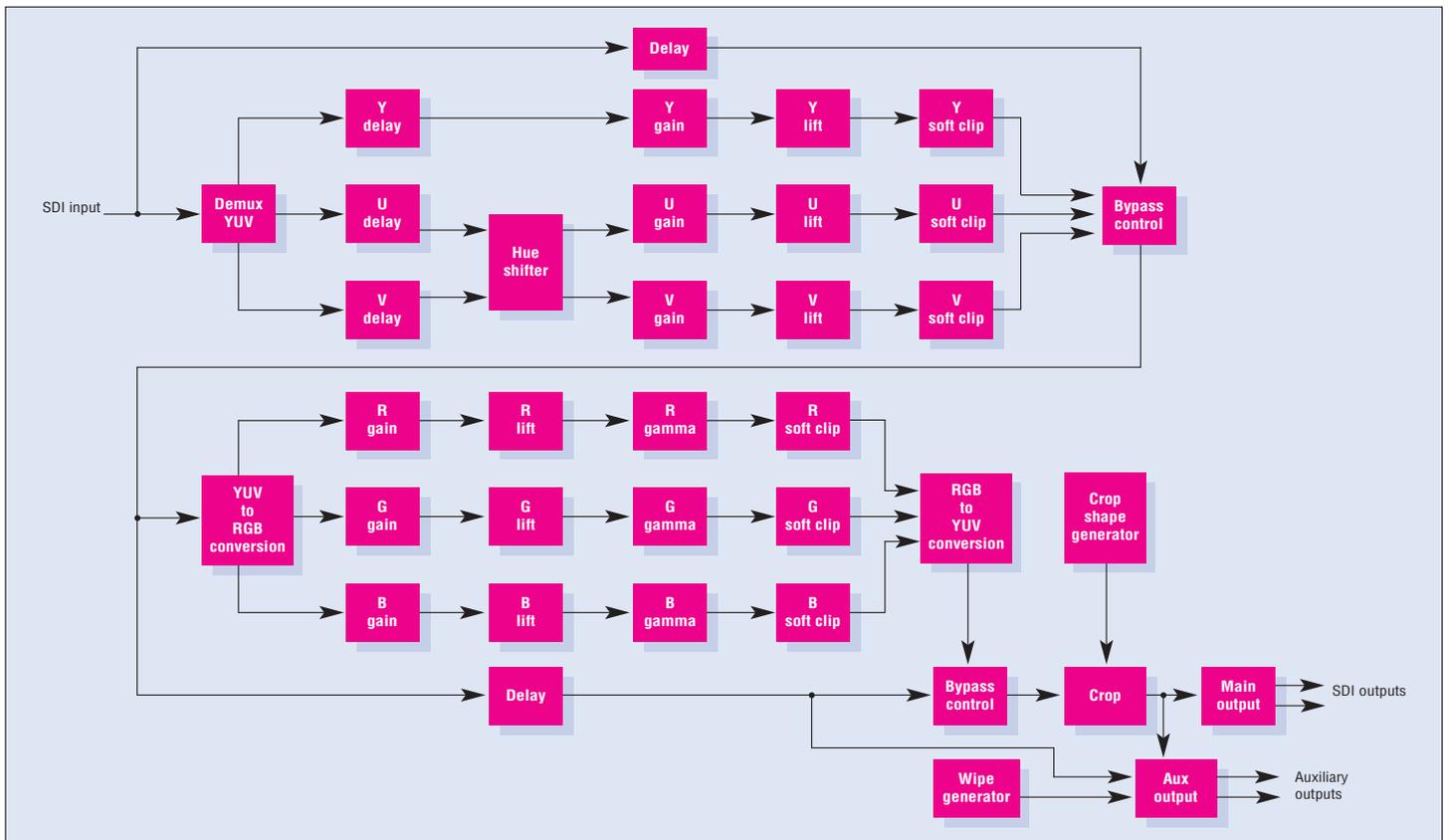
The space-saving CoCo is an indispensable tool in any broadcast environment and is especially useful for multi-channel applications. One of the most popular uses is to adjust the colours on in shot studio plasma displays. CoCo can be placed on broadcast station/OB van lines in or before an encoder to set the range of colours to be transmitted. It is also ideal for graphics suites and for correcting computer-generated or post production outputs.



BBC News 24 uses CoCo to adjust its in shot monitors



- 10 bit digital colour corrector and legaliser
- Space-saving: 100mm x 266mm module allows 12 CoCos in 2U (24 in 4U, six in 1U and two in desk top box)
- Allows independent digital image adjustments in RGB and YUV domains
- Wide range of tools to adjust level, gain, gamma, clipping and timing
- Overall and independent RGB gamma adjustment
- Changes YUV colours illegal in RGB to be valid in RGB
- Bypass control
- Passes ancillary information
- 16 user memories
- Auxiliary output allows preview of adjustments, with wipes between input and output
- Flexible control, including dedicated control panel and PC software



## SPECIFICATION

### MECHANICAL

Standard Crystal Vision module 266mm x 100mm  
Weight: 200g  
Power consumption: 10 Watts

### VIDEO INPUTS

SDI 270Mbit to EBU 3267-E and SMPTE 259M  
One SDI input  
Cable equalisation >200m Belden 8281 or equivalent  
Auto 625/525 line selection  
Minimum input to output delay approx. 1us

### VIDEO OUTPUTS

SDI 270Mbit to EBU 3267-E and SMPTE 259M with inserted EDH on main outputs  
Four SDI outputs (two main, two auxiliary) using the RM01 frame rear module

### CONTROL

RS485 multi-drop 19200 baud, 8 bits, no parity  
Control from frame active front panel and remote panel  
Statesman allows control from any PC on a network  
The CoCo Controller is a dedicated 1U control panel for up to 12 CoCos

### GPI INPUT LEVELS

Active: connect to ground  
Inactive: high impedance, or 5 volts  
Input current <50uA

### GPI INPUTS

Memory recall

### GPI OUTPUTS

YUV clip status  
RGB clip status

### ANCILLARY DATA/EMBEDDED AUDIO

All data in the vertical and horizontal blanking interval is passed through unprocessed with full 10 bits. The unit will pass through embedded audio and any ancillary data with a delay that matches the default processing delay of 1us

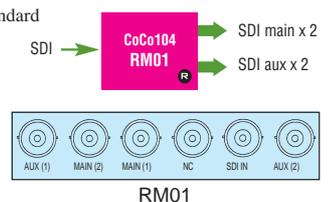
### PROCESSING MODES

Advance/retard Y channel delay  
Advance/retard U and V channels delay (74ns increments)  
Hue shift UV channels  
Increase/decrease overall lift and gain  
Increase/decrease Y channel lift and gain  
Increase/decrease U channel lift and gain  
Increase/decrease V channel lift and gain  
Set and soft limit Y channel positive and negative excursions independently  
Set and soft limit U channel positive and negative excursions symmetrically  
Set and soft limit V channel positive and negative excursions symmetrically  
Increase/decrease R channel lift and gain  
Increase/decrease G channel lift and gain  
Increase/decrease B channel lift and gain  
Increase/decrease overall gamma  
Increase/decrease R gamma  
Increase/decrease G gamma

Increase/decrease B gamma  
Set and soft limit R channel positive excursions  
Set and soft limit G channel positive and negative excursions  
Set and soft limit B channel positive excursions  
Set horizontal and vertical active picture area cropping region on final output  
EDH generation  
16 non-volatile user memory areas  
All limiting has adjustable softness  
Adjustable wipe on auxiliary outputs, for before/after processing comparison  
Overall RGB clip on/off  
Overall board process/bypass selection

### LED INDICATION OF:

Power supplies on board  
SDI input present  
625/525 input standard  
RS422 active  
GPI input status  
YUV clip status  
RGB clip status



## ORDERING INFORMATION

CoCo104	Colour corrector and legaliser
Indigo 4	4U frame with passive front panel for up to 24 Crystal Vision modules
Indigo 4S	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 2A	2U frame with active front panel for up to 12 Crystal Vision modules
Indigo 2S	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
Indigo 1A	1U frame with active front panel for up to six Crystal Vision modules
Indigo 1S	1U frame with passive front panel fitted with Statesman CPU for up to six Crystal Vision modules
Indigo DT	Desk top box with passive front panel for up to two Crystal Vision modules
Indigo DTA	Desk top box with active front panel for up to two Crystal Vision modules
Indigo DTS	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 CoCos in frame (24 in 4U, 12 in 2U, six in 1U, two in desk top box). Gives access to two main outputs and two auxiliary outputs
CoCo Controller	1U dedicated control panel for up to 12 CoCos
REMIND	19" remote control panel
Statesman	PC Control System

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