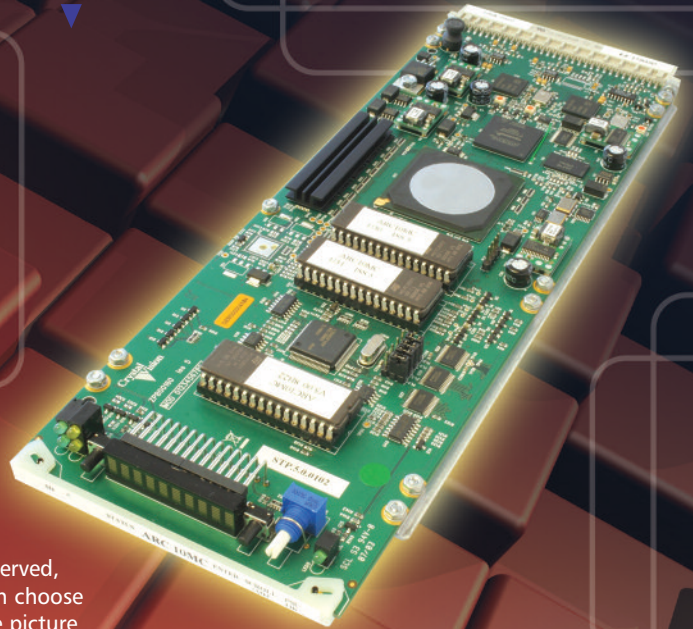# Crystal Vision

ARC-10MC

10 bit bi-directional aspect ratio converter

ARC-10MC is ideal for all aspect ratio conversion applications, especially those that demand high quality.

Designed to change the aspect ratio of a video signal, the broadcast quality 10 bit ARC-10MC includes presets for the six standard conversions between 4:3 and 16:9. Three of these conversions allow 16:9 sources to be shown on a 4:3 monitor with the geometry preserved, while the other three allow similar easy conversion of 4:3 to 16:9. You can choose the conversion that suits you most, with the choice of showing the whole picture with wide black edging, less picture with narrow black edging or even less picture with no black edging. Not only this, but ARC-10MC also allows you to control both the size and position of the picture. You can continuously compress or expand a picture in line and pixel increments up to plus or minus 100 lines and pixels, while vertical and horizontal offsets of the picture bring extra flexibility and allow the easy addition of subtitles. Vertical and horizontal cropping is ideal for cleaning up the edges of the picture and removing unwanted material, with four individual crop controls available. Up to 31 lines can be cropped from the top and bottom of the picture and up to 31 pixels from the left and right.

Exceptional quality conversion comes from a combination of 10 bit processing and motion adaptive video de-interlacing. When scaling a picture the best results are generally obtained by using different techniques depending on whether the video contains slow or fast moving images. Motion adaptive video de-interlacing maximises the picture's vertical resolution and ensures that ARC-10MC will choose the best processing method based on the video content, with the result that the output picture always appears smooth and natural-looking. Changing the aspect ratio can result in an apparently softer picture, therefore the adjustable detail enhancement feature allows the image to be sharpened. Simple colour correction is provided by the RGB gain adjustments, while further picture enhancements are available by using the dc offset adjustment which allows you to alter the black level.

Video index and widescreen signalling detection and insertion make the ARC-10MC useful for some automation applications. Video index control allows you to auto-switch the board to bypass if the input is already in the required aspect ratio, with the switch based on the aspect ratio information carried in the video index data according to SMPTE RP186. Similarly you can choose to bypass the processing when the widescreen signalling (WSS) indicates that the input is a specific shape, again reducing the need for operator intervention. Video indexing and WSS can also both be inserted into the output video for use by downstream equipment. Closed captions can be passed on line 21 in 525 line applications.

ARC-10MC passes embedded audio, ensuring the audio is delayed by the same amount as the video and therefore removing the need for a separate audio delay.

As a 100mm x 266mm module, ARC-10MC also brings space-saving benefits. It fits in the standard Crystal Vision frames allowing easy integration with any SD or HD product from the range. Using the RM34 and RM43 frame rear modules gives two scaled SDI outputs along with two reclocked input loop-throughs allowing distribution of the original SDI signal. The RM43 additionally provides relay bypass protection and helps maintain programme output in the event of power failure or board removal.

Control options include Crystal Vision's intuitive board edge interface, an active frame front panel, a remote control panel or the Statesman PC software.

ARC-10MC: exceptional aspect ratio conversion you can really afford.

- 10 bit bi-directional digital aspect ratio converter
- Exceptional performance thanks to 10 bit processing, motion adaptive video de-interlacing and detail enhancement processing
- Save time with presets for the six most popular aspect ratio conversions
- Three presets allow 16:9 sources to be shown on a 4:3 monitor: 16:9 to 4:3 Letterbox, 16:9 to 14:9 Letterbox and 16:9 to 4:3 Full Screen
- Three presets allow 4:3 sources to be shown on a 16:9 monitor: 4:3 to 16:9 Pillarbox, 4:3 to 14:9 Pillarbox and 4:3 to 16:9 Full Screen
- Continuous vertical and horizontal compression and expansion
- Vertical and horizontal offsets of picture
- Vertical and horizontal cropping
- Video index detection and insertion
- WSS detection and insertion
- GPI selection of presets
- Passes embedded audio with same delay as picture
- Two scaled SDI outputs and two loop-throughs
- Relay bypass protection
- Space-saving: 100mm x 266mm module allows 12 ARC-10MC in 2U (24 in 4U, six in 1U and two in desk top box)
- Flexible control, including board edge, front and remote panels and PC software

MECHANICAL
Standard Crystal Vision module 266mm x 100mm
Weight: 225g
Power consumption: 8 Watts

VIDEO INPUT
One SDI input with reclocking
SDI 270Mbit to EBU 3267-E and SMPTE 259M
Cable equalisation >250m Belden 8281 or equivalent
Auto 625/525 line selection
May contain embedded audio or data (10 bit data path)

VIDEO OUTPUTS
Two scaled SDI outputs using RM34 and RM43 frame rear modules
Two equalised and reclocked input loop-throughs
The RM43 provides relay bypass protection to help maintain programme output. An electromechanical relay switch needs power to hold the switch in one state and will revert to the other state (board bypass) on loss of power. It prevents signal loss by mechanically connecting the input to main output 1 on complete frame power failure or board removal
SDI 270Mbit to EBU 3267-E and SMPTE 259M
10 bit picture with 10 bit ancillary data path

DELAY THROUGH BOARD
One frame

PICTURE PROCESSING
Presets for the six standard conversions to put a 16:9 source on a 4:3 monitor, or a 4:3 source on a 16:9 monitor. The available presets are: 16:9 to 4:3 Letterbox, 16:9 to 14:9 Letterbox, 16:9 to 4:3 Full Screen, 4:3 to 16:9 Pillarbox, 4:3 to 14:9 Pillarbox and 4:3 to 16:9 Full Screen. It is also possible to select no conversion with the same delay
Vertical and horizontal picture size adjust + or - 100 lines and pixels
Vertical and horizontal picture offset + or - 100 lines and pixels
Pixel based motion adaptive de-interlacing means that ARC-10MC will automatically choose the best processing method based on the video content. In video containing significant movement the output picture will look natural and smooth
Adjustable detail enhancement allows the user to sharpen the edges in the image
RGB gain and dc offset adjustments allow control of the image brightness, contrast and colour
Processing is 10 bit with 10 bit data path in horizontal and vertical blanking interval to allow embedded audio or data
Vertical and horizontal cropping allows up to 31 lines to be cropped from the top and bottom of the picture and up to 31 pixels from the left and right
Closed captions on line 21 in 525 line can be passed
Video index and widescreen signalling (WSS) detection allow the ARC-10MC to auto-switch to bypass if the input is already in the required aspect ratio. Video index to SMPTE RP186. WSS to ETSI EN 300 294 (625 line)
The ARC-10MC can insert appropriate video index and/or WSS into the output video for use by downstream equipment. WSS and video index controls are completely independent allowing insertion of both types of data on to the video output. Alternatively, video index data and WSS on the incoming video can be passed through the ARC-10MC, or blanked. Should WSS and video indexing both be present on the input video, preference will be given to video indexing

GPI INPUT LEVELS
Active: pull to ground, pulled up to +5V through 10 kohm

GPI OUTPUT LEVELS
Electrically: Open collector transistors 48V, 270 ohm current limit resistors. Pulled up to +5V through 1 kohm

GPI INPUTS
GPI recall of eight presets. By default the first six each contain a different one of the standard conversions

## GPI OUTPUT
Input missing

LED INDICATION OF:
Input present
Power supplies okay

LOCAL CONTROL
Intuitive board edge interface with two select buttons, shaft encoder and 10 character alphanumeric display
Conversion set by board edge menu

REMOTE CONTROL
RS422/485
19200 baud, 8 bits, 1 stop no parity
Control from frame active front panel or remote panel
Statesman allows control from any PC on a network
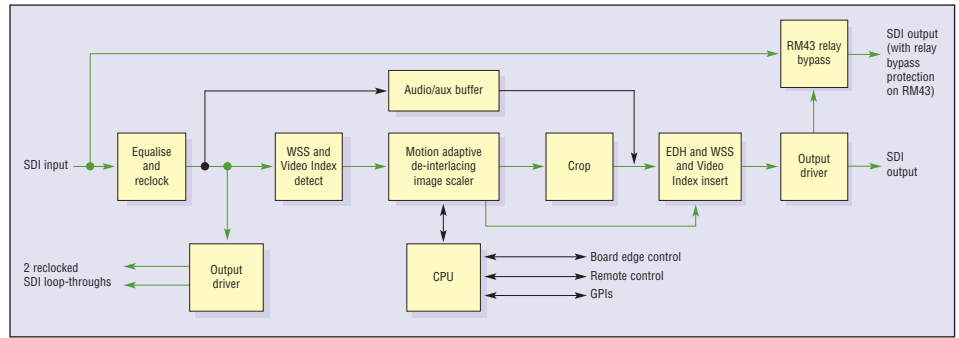
16:9 to 4:3 Letterbox
- Full 16:9 source width mapped to 4:3 monitor width
- Full source height compressed to 75% of monitor height
- Horizontal black bands added to top and bottom
- No picture lost

16:9 to 14:9 Letterbox
- Central 87.5% of 16:9 source width stretched to 4:3 monitor width
- Full source height compressed to 87.5% of monitor height
- Horizontal black bands added to top and bottom
- Minimal picture lost

16:9 to 4:3 Full Screen
- Central 75% of 16:9 source width stretched to 4:3 monitor width
- Full source height mapped to monitor height
- No horizontal black bands required
- Significant picture lost

4:3 to 16:9 Pillarbox
- Full 4:3 source width compressed to central 75% of 16:9 monitor width
- Full source height mapped to monitor height
- Vertical black bands added to left and right
- No picture lost

4:3 to 14:9 Pillarbox
- Full 4:3 source width compressed to central 87.5% of 16:9 monitor width
- Central 87.5% of source height stretched to monitor height
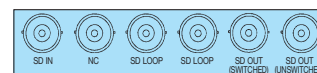- Vertical black bands added to left and right
- Minimal picture lost

4:3 to 16:9 Full Screen
- Full 4:3 source width mapped to 16:9 monitor width
- Central 75% of source height stretched to monitor height
- No vertical black bands required
- Significant picture lost
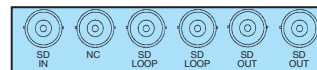
ORDERING INFORMATION

ARC-10MC	10 bit bi-directional digital aspect ratio converter with motion adaptive video de-interlacing
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
RM34	Single slot frame rear module. Allows maximum number of ARC-10MC in frame (24 in 4U, 12 in 2U, six in 1U, two in desk top box). Gives access to two SDI outputs and two SDI reclocked loop-throughs
RM43	Single slot frame rear module. Allows maximum number of ARC-10MC in frame (24 in 4U, 12 in 2U, six in 1U, two in desk top box). Provides relay bypass protection. Gives access to two SDI outputs and two SDI reclocked loop-throughs
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. ARC10MC0808