ShARC-XP

Horizontal aspect ratio converter

USER MANUAL

Crystal Vision

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Contents

1 Introduction

The ShARC102-XP is a single channel, broadcast quality, 10 bit serial digital video aspect ratio converter. The ShARC204-XP is a dual 10 bit serial digital video aspect ratio converter permitting 24 independent channels in a 2U frame. The module can be controlled locally from the card edge or by frame active front panel. Remote control is possible using Crystal Vision's active control panel REMIND, or Statesman PC Control Software. The GPI port can also be used for 442 control or simple switching, providing a final method of remote use.

Dedicating the image processing to these conversions allows a higher quality output compared with multi-purpose ARCs. The result is low levels of aliasing and banding coupled with a wide frequency response. No vertical processing is employed so the propagation delay is minimised.

Two main operational modes are available for each channel: convert mode and bypass mode. In each convert mode, two conversion types are available.

One stretches horizontally the central 75% of the input image to the full width of the output picture monitor. This permits a 16:9 input to be displayed correctly on a 4:3 picture monitor. The second conversion squashes horizontally the entire input image to 75% of its size and puts this in the centre of the output image with black bands down the sides. This permits a 4:3 input to be displayed correctly on a 16:9 picture monitor.

16:9 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 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

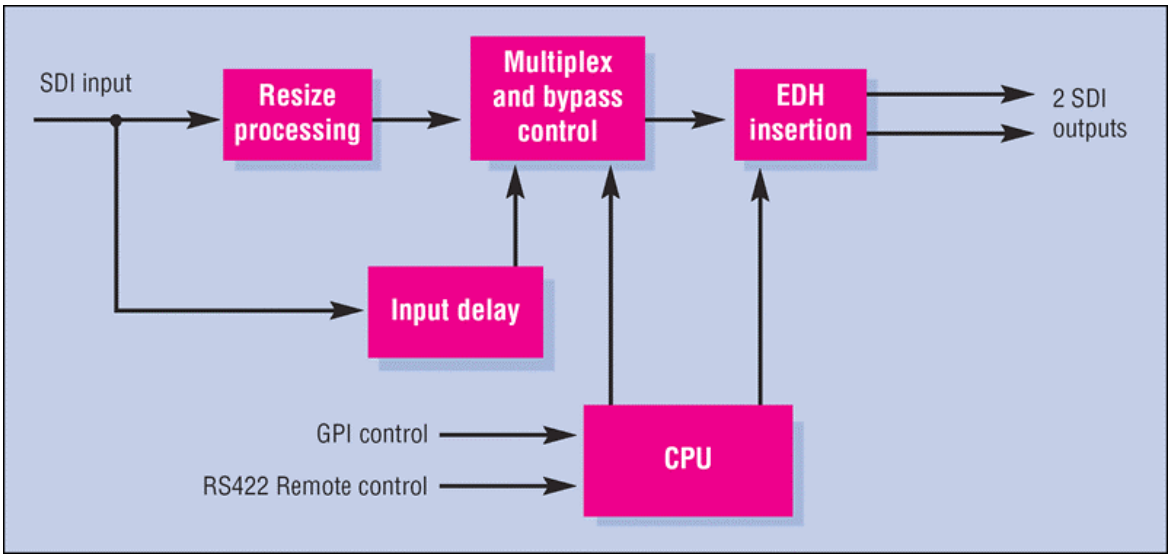
No picture lost

ShARC-XP conversions

625 or 525 line standard outputs are produced with automatic standard detection. EDH transmission is added to the output. Digital audio and 10 bit ancillary data is passed through unprocessed. There is a fixed propagation delay of 10μs between input data and output data even when bypass mode is selected.

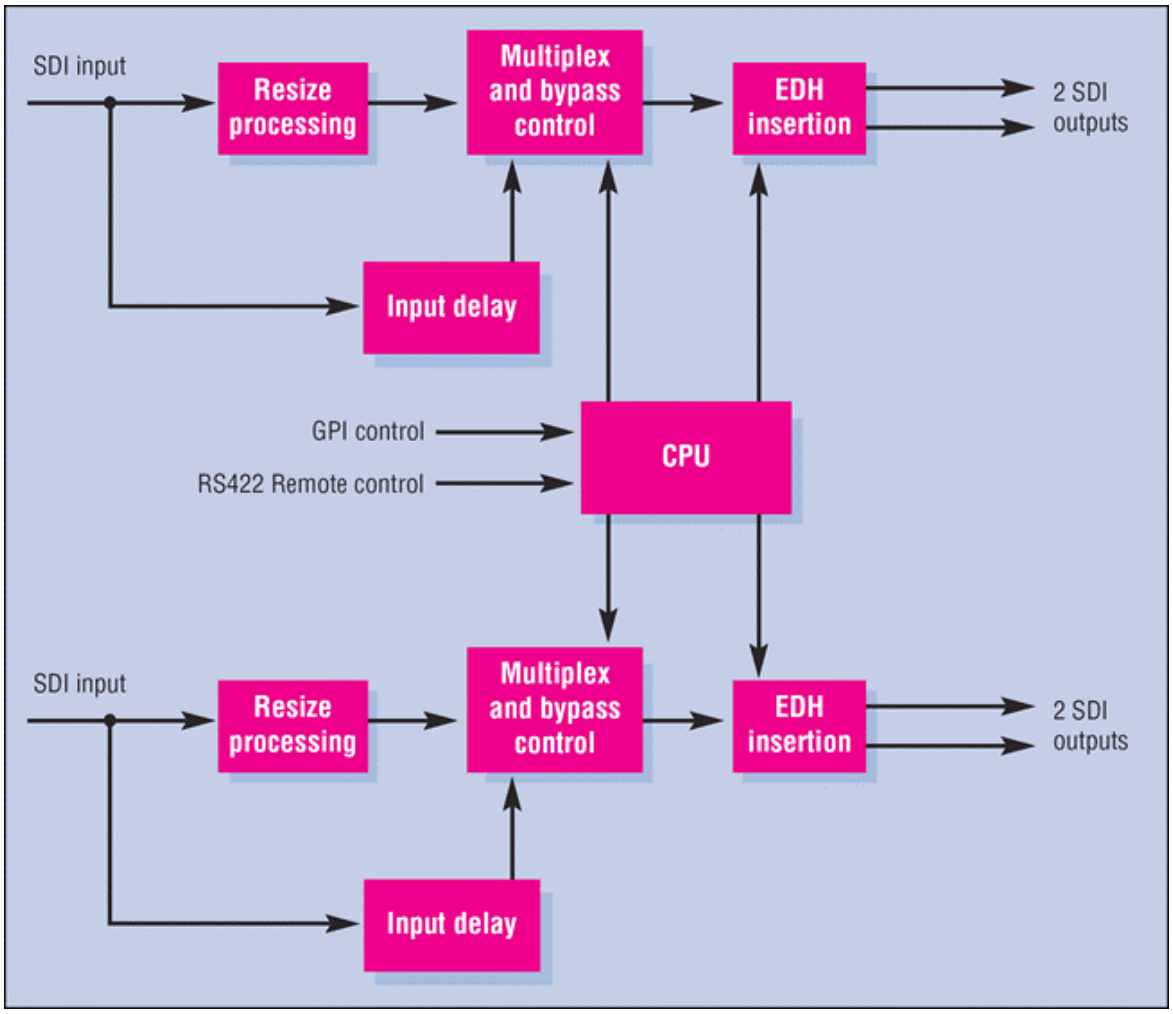
The unit will plug into the front of the rack frame and the universal connection system will allow a mixture of Crystal Vision modules, without the use of extra rear panels, in 4U, 2U, 1U frames and desk top boxes.

The hinged front panel of the case reveals user control of the card and also LED indication of status. There is a four way piano switch to select modes of operation. Further configuration is possible using movable links.



ShARC102-XP

The ShARC204-XP has 2 channels with independent control of their respective conversion settings.



ShARC204-XP

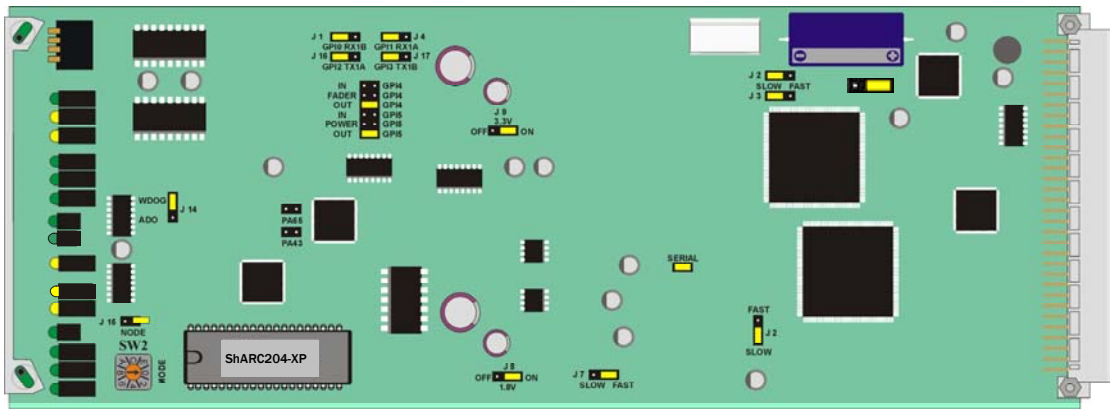
Both the ShARC102-XP and ShARC204-XP have up to five methods of control.

- Board edge switches allow control and monitoring of conversion status
- Active control panel, either frame front or remote panel (REMIND)
- Statesman PC Control
- General Purpose Interface (GPI) with status 'tally'
- Third party 422 control via GPI port

2 Hardware installation

2.1 Module configuration

The ShARC-XP has a large number of jumper links of which two sets are user adjustable. The remainder jumper links are factory set and should not be reconfigured by the user, as it is likely to result in the board malfunctioning. Where there is an NTSC requirement to place closed caption data on lines 20/21 the ShARC-XP can leave these lines unprocessed.



The ShARC204-XP module

2.2 Jumper links

Link	Text	Description
J1	GPI0 RX1B	Default position. Allows use of GPI control. Enables GPI port 422 comms.
J4	GPI1 RX1A	Default position. Allows use of GPI control. Enables GPI port 422 comms.
J16	GPI2 TX1A	Default position. Allows use of GPI control. Enables GPI port 422 comms.
J17	GPI3 TX1B	Default position. Allows use of GPI control. Enables GPI port 422 comms.
J10	None	Default towards edge connector. All lines processed. Towards broad front. Lines 20/21 unprocessed (NTSC only).

Note: Links J1, J4, J16 and J17 are all to be moved together.

2.3 Remote control protocol

Baud rate	19200
Parity	None
Data bits	8
Stop bits	1
Hand shaking	None

Please contact factory for remote protocol.

The NODE rotary switch SW2 selects one of 16 different remote protocol addresses for the board when used in Crystal Vision frames FR1-6 and FR2-12. The NODE rotary switch SW2 should be left in the '0' position when used in an FR2-12AV or frame from the Indigo range. The remote protocol address can be read from the slot position the board is plugged into.

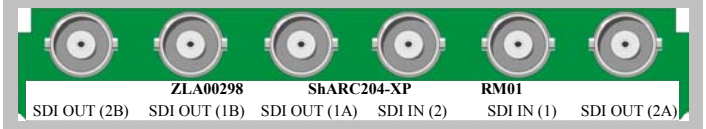
2.4 Rear modules and signal I/O

The Indigo 4 4U frames will house up to 24 single height modules with up to three power supplies. The FR2AV and Indigo 2U frames will house up to 12 single height modules and have dual power supplies. The FR1AV and Indigo 1U frames will house six single height modules and a single power supply. The DTBAV and Indigo desk top boxes have a built-in power supply and will house up to two single height modules.

RM01

RM01 modular rear connector for ShARC102-XP	Description
	**RM01(ZLA00297 artwork)** • 24 ShARC-XP modules per 4U Indigo 4 frame • 12 per 2U Indigo 2 frame • Six per 1U Indigo 2 frame • Two in an Indigo desk top box • All frame slots can be used

BNC	Function
N/C	No connection
SDI IN	Serial digital input
N/C	No connection
SDI OUT (A)	Serial digital output
SDI OUT (B)	Serial digital output
N/C	No connection

RM01 modular rear connector for ShARC204-XP	Description
	**RM01(ZLA00298 artwork)** • 24 ShARC-XP modules per 4U Indigo 4 frame • 12 per 2U Indigo 2 frame • Six per 1U Indigo 2 frame • Two in an Indigo desk top box • All frame slots can be used

Note: One ShARC-XP card can be fitted to each RM01 rear module.

BNC	Function
SDI OUT (2A)	Channel 2 serial digital output 2 (ShARC204-XP only)
SDI IN (1)	Channel 1 serial digital input
SDI IN (2)	Channel 2 serial digital input (ShARC204-XP only)
SDI OUT (1A)	Channel 1 serial digital output 2
SDI OUT (1B)	Channel 1 serial digital output 1
SDI OUT (2B)	Channel 2 serial digital output 2 (ShARC204-XP only)

Note: For details of fitting rear connectors please refer to the appropriate frame manual.

2.5 General Purpose Interface (GPI)

ShARC-XP, as with most Crystal Vision modules, is equipped with GPI control I/O.

Remote control of the aspect ratio conversion mode on each channel other than via the serial remote protocols is possible.

Remote connections

For Channel 1, DIL 1 and DIL 2 need to be in the 'UP' position. Jumpers on J1, J4, J16 and J17 need to be moved on to their GPI position. Remote control via auxiliary RS422 will no longer be possible. In this configuration a remote switch shorting to ground can be as defined below. Pull-up resistors are already present.

For Channel 2, DIL 3 and DIL 4 need to be in the 'UP' position. Likewise jumpers on J1, J4, J16 and J17 need to be moved on to their GPI position. Again remote control via auxiliary RS422 will no longer be possible. In this configuration a remote switch shorting to ground can be as defined below. Pull-up resistors are already present.

Each slot has an associated set of connections on a socket and on a plug. The letters in the table below refer to the connections described elsewhere in the manual.

Each slot has an associated set of connections on the frame rear-panel remote connectors. The tables below show the GPI connections and describe their action.

GPI			Remote	4:3 input to 16:9 output	16:9 input to 4:3 output	4:3 input to 16:9 output	16:9 input to 4:3 output	Bypass	Bypass
0	**'a'**	**Ch1**	High	Low	High			Low	
1	**'b'**		High	High	Low			Low	
2	**'c'**	**Ch2**	High			Low	High		Low
3	**'d'**	**(204-XP)**	High			High	Low		Low
4	**'e'**	**'tally out'**	High	Low	Low	High	High	High	High
5	**'f'**	**'tally out'**	High	High	High	Low	Low	High	High

Table showing GPI (General PurposeInterface) control

As supplied, each GPI output has a 330Ohm resistor in series with its output. This allows for an external LED to be driven, connected to a DC voltage of +5V.

Note: Latching switches are required

If DIP switches are used and then GPI is used, the last GPI command becomes the control method. This may lead to the DIP switch settings not corresponding to the output. To resume DIP control again, toggle the required DIP switch.

4U frame GPI connections

GPI lines 'a' to 'f' of each card connect to one of eight rear remote connectors as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	8 (3)	9 (3)	18 (3)	26 (3)	19 (4)	20 (4)
4	7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
6	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7	5 (3)	6 (3)	15 (3)	24 (3)	1 (4)	2 (4)
8	4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
10	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11	3 (3)	12 (3)	22 (3)	21 (3)	12 (4)	13 (4)
12	10 (3)	11 (3)	19 (3)	20 (3)	21 (4)	22 (4)
	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (5)	9 (5)	18 (5)	26 (5)	19 (6)	20 (6)
2	7 (5)	16 (5)	17 (5)	25 (5)	10 (6)	11 (6)
3	8 (7)	9 (7)	18 (7)	26 (7)	19 (8)	20 (8)
4	7 (7)	16 (7)	17 (7)	25 (7)	10 (8)	11 (8)
5	5 (5)	6 (5)	15 (5)	24 (5)	1 (6)	2 (6)
6	4 (5)	14 (5)	13 (5)	23 (5)	3 (6)	4 (6)
7	5 (7)	6 (7)	15 (7)	24 (7)	1 (8)	2 (8)
8	4 (7)	14 (7)	13 (7)	23 (7)	3 (8)	4 (8)
9	3 (5)	12 (5)	22 (5)	21 (5)	12 (6)	13 (6)
10	10 (5)	11 (5)	19 (5)	20 (5)	21 (6)	22 (6)
11	3 (7)	12 (7)	22 (7)	21 (7)	12 (8)	13 (8)
12	10 (7)	11 (7)	19 (7)	20 (7)	21 (8)	22 (8)

Upper

Lower

Table shows pin number (Remote number)

Note: Remote 1, Remote 3, Remote 5 and Remote 7 are 26 way high density D-Type female sockets and frame ground is pin 2 and +5V @500mA is pin 1 in each case.
Remote 2 and Remote 4 are 26 way high density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15 in each case.

2U frame GPI connections

GPI lines 'a' to 'f' of each card connect to one of four rear remote connectors as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	8 (3)	9 (3)	18 (3)	26 (3)	19 (4)	20 (4)
4	7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
6	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7	5 (3)	6 (3)	15 (3)	24 (3)	1 (4)	2 (4)
8	4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
10	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11	3 (3)	12 (3)	22 (3)	21 (3)	12 (4)	13 (4)
12	10 (3)	11 (3)	19 (3)	20 (3)	21 (4)	22 (4)

Table shows pin number (Remote number)

Note: Remote 1 and Remote 3 are 26 way high density D-Type female sockets and frame ground is pin 2 and +5V @500mA is pin 1 in each case.
Remote 2 and Remote 4 are 26 way high density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15 in each case.

1U frame GPI connections

GPI lines 'a' to 'f' of each card connect to one of two rear remote connectors as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3	5 (1)	6 (1)	15 (1)	24 (1)	1 (2)	2 (2)
4	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
5	3 (1)	12 (1)	22 (1)	21 (1)	12 (2)	13 (2)
6	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)

Table shows pin number (Remote number)

Note: Remote 1: 26 way high-density D-type socket. Frame ground is pin 2 and +5V @500mA is pin 1.
Remote 2: 26 way high-density D-Type plug. Frame ground is pin 6 and +5V @500mA is pin 15.

DTB-AV desk top box GPI connections

GPI lines 'a' to 'f' of each card connect to the rear remote connector as follows:

Slot no.	'a' pin	'b' pin	'c' pin	'd' pin	'e' pin	'f' pin
1	1	2	3	4	5	6
2	9	10	11	12	13	14

Note: Remote connector is 15 way normal density D-type socket. Frame ground is pin 15.

Indigo DT desk top box GPI connections

GPI lines ‘a’ to ‘f’ of each card connect to the rear remote connector as follows:

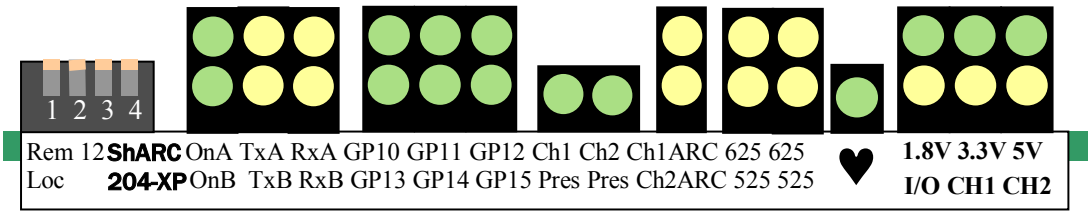
Slot no.	‘a’ pin	‘b’ pin	‘c’ pin	‘d’ pin	‘e’ pin	‘f’ pin
1	8 (1)	9 (1)	18 (1)	26 (1)	19 (2)	20 (2)
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)

Table shows pin number (Remote number)

Note: Remote 1: 26 way high-density D-Type socket. Frame ground is pin 2 and +5V @500mA is pin 1.
Remote 2: 26 way high-density D-Type plug. Frame ground is pin 6 and +5V @500mA is pin 15.

3 Card edge operation

The hinged front panel of the case reveals user control of the card and LED indication of card status.



ShARC204-XP front view showing controls and LEDs

3.1 LED status indication

The board-edge LEDs allow the operating modes and status to be monitored.

Description	Colour	Status when illuminated
OnA	Green	Active front panel communications online.
TxA	Yellow	ShARC-XP transmitting to active front panel.
RxA	Yellow	ShARC-XP receiving from active front panel.
OnB	Green	Reserved communications channel online.
TxB	Yellow	ShARC-XP transmitting on reserved communications channel.
RxB	Yellow	ShARC-XP receiving on reserved communications channel.
GP10	Green	GPI input 0 shorted to ground. Channel 1 aspect ratio conversion on. (4:3 to 16:9).
GP11	Green	GPI input 1 shorted to ground. Channel 1 aspect ratio conversion on (16:9 to 4:3).
GP12	Green	GPI input 0 shorted to ground. Channel 2 aspect ratio conversion on. (4:3 to 16:9). ShARC204-XP only.
GP13	Green	GPI input 1 shorted to ground. Channel 2 aspect ratio conversion on. (16:9 to 4:3). ShARC204-XP only.
GP14	Green	GPI input 4 shorted to ground. No effect. (GPI4 set to input).
GP15	Green	GPI input 5 shorted to ground. No effect. (GPI5 set to input).
Ch1 Pres	Green	Valid video input detected on Channel 1.
Ch2 Pres	Green	Valid video input detected on Channel 2 (ShARC204-XP only).
Ch1 ARC	Yellow	625 line input detected on Channel 1.
Ch2 ARC	Yellow	525 line input detected on Channel 1.
Ch1 625	Yellow	625 line input detected on Channel 1.

Description	Colour	Status when illuminated
Ch1 525	Yellow	525 line input detected on Channel 1.
Ch2 625	Yellow	625 line input detected on Channel 2 (ShARC204-XP only).
Ch2 525	Yellow	525 line input detected on Channel 2 (ShARC204-XP only).
♥	Green	Heartbeat. When beating all processor functions are healthy.
I/O	Yellow	Input/output programmable logic configured.
CH1	Yellow	Channel 1 programmable logic configured.
CH2	Yellow	Channel 2 programmable logic configured. (ShARC204-XP only)
1.8V	Green	1.8V supply voltage present.
3.3V	Green	3.3V supply voltage present.
5V	Green	5V supply voltage present.

3.2 Board edge DIP switches

The board edge piano switches DIP1-4 allow full control of ShARC-XP channel configuration. Their individual functions are listed in the table below.

Lever		Remote	4:3 input to 16:9 output	16:9 input to 4:3 output	4:3 input to 16:9 output	16:9 input to 4:3 output	Bypass	Bypass
1	**Ch1**	Up	Down	Up			Down	
2		Up	Up	Down			Down	
3	**Ch2**	Up			Down	Up		Down
4	**(204-XP)**	Up			Up	Down		Down

4 way DIL switch functions

If DIP switches are used and then GPI is used, the last GPI command becomes the control method. This may lead to the DIP switch settings not corresponding to the output. To resume DIP control again, toggle the required DIP switch.

4 Using the active front panel

4.1 Module selected

This operational guide assumes that the panel has been setup according to the Panel Setup procedure described in the Crystal Vision Control Panel manual.

Note: It is **ESSENTIAL** that the panel setup procedure is followed and any old or unknown passwords cleared prior to using the panel for the first time.

At power up, the two line 20-character screen will display ‘Crystal Vision’ followed by the firmware version number for the control panel. All eight control panel key LEDs will illuminate.

The Crystal Vision control panel start up display

'Control Panel' then briefly replaces the version number display.

If the control panel firmware has been updated for Statesman control (version 1.5.0 or higher), Statesman Mode will be entered and the message, ‘Press CAL to Exit’ will be displayed and the CAL LED will light.

Statesman mode is entered by default

To continue with control panel operation or configuration, press the CAL key once. A second press of the CAL key will return to Statesman control.

The control panel will display the name of the card that first responds to the polling request together with its location number.

The location number consists of the frame number plus the card position in the frame.

Navigating the display

The functions assigned to control panel keys are:

- DEVICE – enters Device menu to select a card or show cards available / enters Panel Setup when held down during power up / shows frame status when pressed from Statesman mode
- CAL – enters or leaves Statesman mode / enters panel diagnostics mode when held down during power up / updates the display
- Asterisk – enters board rename menu from the Device menu
- F1 to F4 – soft keys, function assigned within each menu
- HOME – moves the display to the home menu
- ENTER – accepts current selection
- Upward arrow – used to move up the menu structure / enter lock panel menu from the Device menu
- Rotary control – shaft encoder used to select options or variable data

Menu numbering scheme

This manual uses a simple menu numbering convention based on the sequence of keys required to reach each menu from the top level home menu. For example, menu 1.1.2 is reached from the home menu by pressing F1, then F2. Menu 1.2.3 is reached by pressing F2 and then F3.

Note: Please refer to the Crystal Vision Control Panel manual for details of the Panel Setup, Lock Panel and Diagnostic menus.

Selecting ShARC-XP

To select a particular card in a frame, press the DEVICE key to go to the Device menu. The top line of the display will show 'Available Cards X', where X is the number of cards that have responded so far to the polling request.

The available cards menu

Rotate the shaft encoder and the bottom row will display the successfully polled cards by name and location or slot number.

In the example above, the card displayed is located in the first frame in slot number 2.

When the desired card is selected press the ENTER key to access that card's Home menu.

The message shows that a ShARC102-XP or ShARC204-XP has been selected with the version of software on the module as V1.00. Depending on the software version and whether a ShARC102-XP is being controlled, the output may differ from that shown above.

If remote control has been enabled, the control panel will then enter card mode and communicate with the ShARC-XP at the node number last displayed in the available cards list.

The ShARC-XP home menu

Updating the display

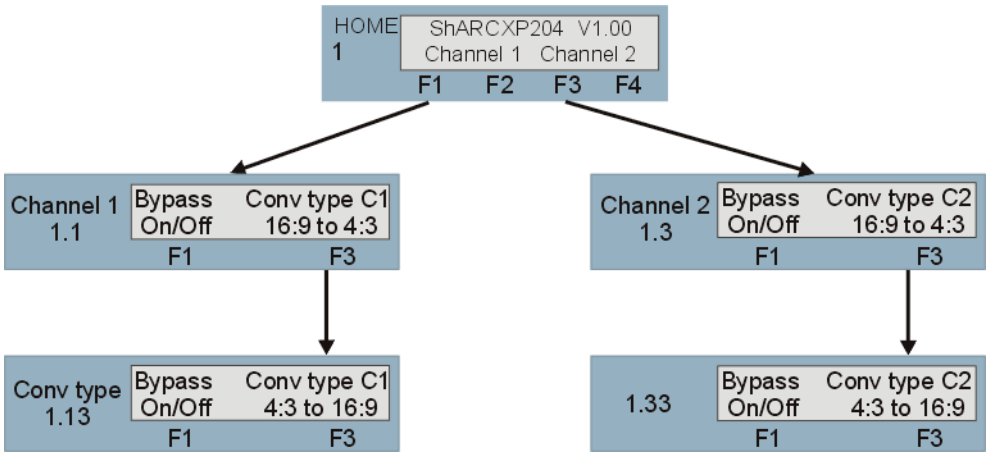
The values displayed on an active front panel are only updated when an adjustment is made and when changing menu level. If mode changes occur through the use of Statesman, card edge controls or through automatic response to the input video signal, the text displayed on the active front panel will not be updated immediately. If necessary, press CAL to update the display.

4.2 The ShARC-XP menu structure

The main top-level menus are obtained by pressing the F1, F2 and F4 keys from the HOME menu. Menu keys are illuminated when active and when further menus are available. The three top-level menus are:

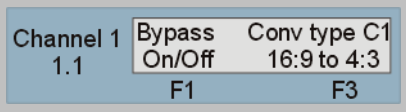
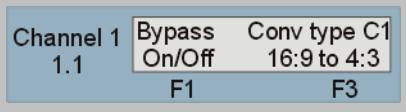
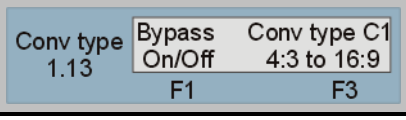
- Channel 1 (Configuration) – press F1
- Channel 2 (Configuration) – press F3

The following chart shows the available ShARC-XP menus. The actual menus available may vary slightly as software is updated.



The ShARC-XP menu tree

Note: Function keys LEDs are illuminated when active.

Configuration menu structure	Description
	Use F1 to select Bypass mode. Input is passed to the output unprocessed.
	Use F3 to toggle 16:9 to 4:3 conversion mode.
	Use F3 to toggle 4:3 to 16:9 conversion mode.

Bypass mode

When Bypass mode is selected the input program is passed to the output unprocessed. The ShARC204-XP dual channel module can individually bypass either Channel 1 or 2.

Conversion mode

Toggling F3 selects either of the conversion modes. One converts from 16:9 where a centre cut is performed and the resulting picture is stretched to fill the screen on a 4:3 monitor. In 4:3 to 16:9 mode the 4:3 picture is squeezed to 75% of its height and black bands added to either side so that it will fit a 16:9 monitor.

With the ShARC204-XP both Channels 1 and 2 can be controlled independently from each other.

5 Statesman

The Crystal Vision Statesman PC Control Software is designed to control a range of Crystal Vision modules via serial control from a PC.

The main Statesman application communicates with each module in a frame that is fitted with an active front panel. This panel can be with or without an LCD display. Statesman will not normally be able to detect modules used in a frame with only a passive front panel unless it is part of an active/passive combination.

5.1 Installing Statesman

Minimum pre-requisites:

- A PC running Windows 98, NT4 with SP 5 or higher, Windows 2000 or Windows XP
- A parallel port dongle supplied with the Statesman software package
- An RS422 serial connection from the host PC to the Indigo frame control input or to Remote 2 connector on an FR1AV or FR2AV Crystal Vision frame with at least one ShARC-XP module and/or other Statesman compatible module
- An active control panel MUST be fitted to the frame with version 1.63 or above firmware – if it is an Indigo frame the firmware must be V1.04 or above
- An optional RS422 to RS232 converter if the PC has no RS422 ports

Installing Statesman

- Refer to the readme and/or help file on the CD before proceeding
- To view all application windows, set graphics resolution to at least 1024 x 768
- Remove any previous version of the Statesman software using the Add/Remove Programs application in the Windows control panel
- Ensure that the Statesman dongle is fitted to the parallel port of the host PC
- Insert the Statesman CD and the installation should start immediately – if it does not, run the setup.exe file on the CD
- Obey any installation program prompts and restart the PC when asked

Running Statesman for the first time

The Statesman PC Control System may be run from the Crystal Vision programs folder via the Start menu or by double-clicking on the Crystal Vision.exe file in the installed program directory.

When the program runs it will require licence information and an administrator name and password. It will also need to know which computer port is being used to connect to a Crystal Vision frame(s).

Note: For further details of Statesman configuration please refer to the Statesman manual.

5.2 Statesman operation

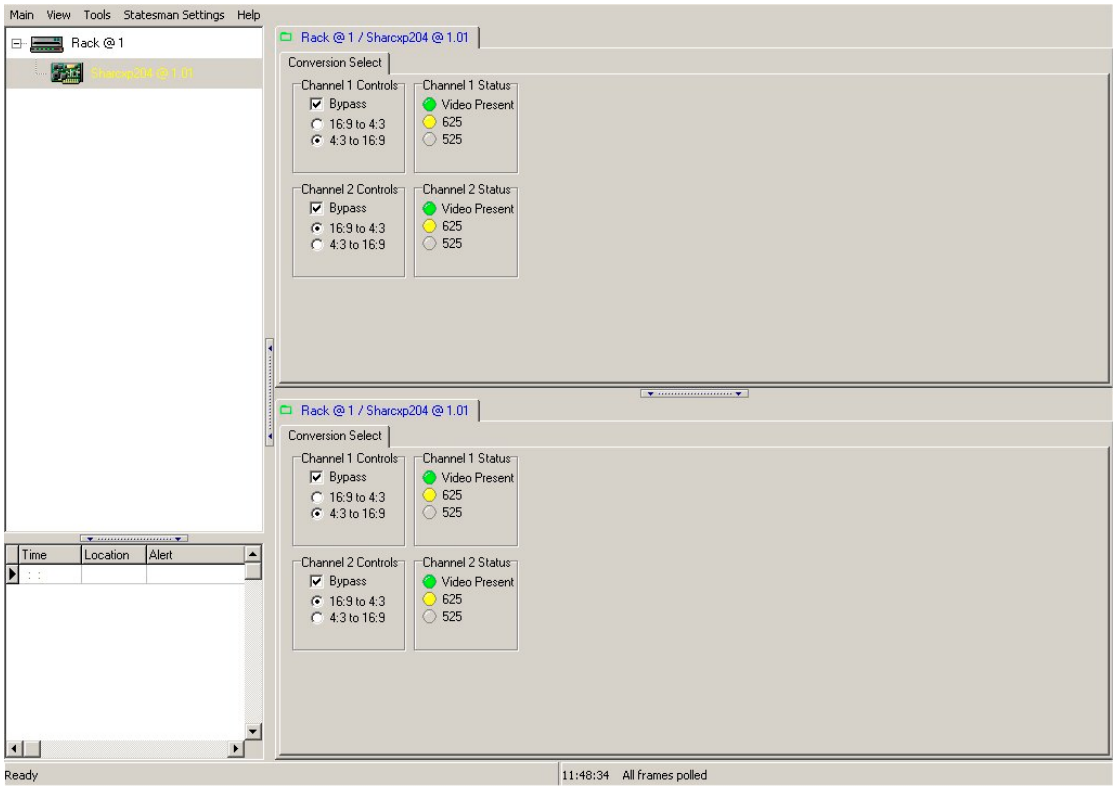
Once Statesman is configured it should automatically detect any Statesman compatible modules in the connected frame or frames and display them in the main application left hand explorer-style window.

Open any frame by clicking on the + sign or by double clicking on a frame. Installed modules should be shown with module icons. Frame and module icons can be named as desired by right-clicking or using the edit menu and choosing rename.

To aid user recognition of module and frame status quickly, the following colour and size coding is used:

- A module is shown present by full colour and absent by greyed colour
- A module is shown open by large icon and closed by small icon
- A module is the source of an active alarm if red and not alarmed if green

Double-clicking on a module will enable the display of the main application menus.



Statesman main application window

The two large control panes shown in the upper and lower halves of the window may display different menus for the same card, or controls for different cards. Click on the horizontal button-bar between the two panes to close the lower plane or drag the button to vary the size of the panes.

Note: For further details of Statesman configuration and operation please refer to the Statesman manual.

Conversion and status

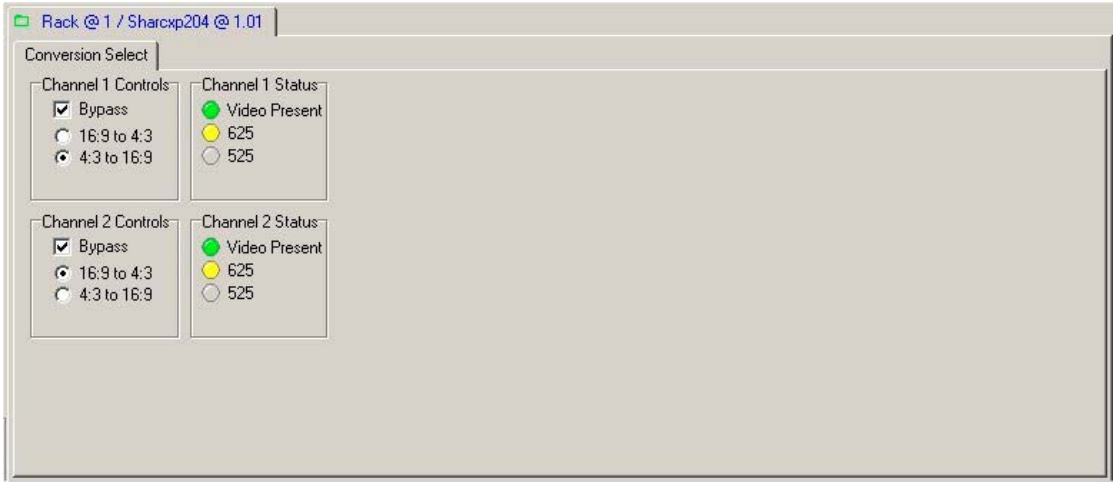
The conversion select tab provides access to the following:

Channel 1

- Bypass
- Conversion 16:9 to 4:3
- Conversion 4:3 to 16:9
- Video input present
- Input line standard PAL/NTSC

Channel 2 (ShARC204-XP only)

- Bypass
- Conversion 16:9 to 4:3
- Conversion 4:3 to 16:9
- Video input present
- Input line standard PAL/NTSC



Conversion and monitoring

Channel controls

The channel controls are as follows:

Chl control setting	Description
Bypass on/off	With Bypass ON the input appears on the output unconverted.
16:9 to 4:3	The centre 75% of the 16:9 picture is stretched to correctly fit the 4:3 format. Results in significant picture loss.
4:3 to 16:9	The 4:3 picture is applied to the centre 75% of the 16:9 image with no loss of picture. Vertical black bars are added either side of the picture.

Channel status

Status indication is as follows:

Input setting	Description
Video present	Green when input detected. Red when no input detected.
625/525	Indicates input line standard detected.

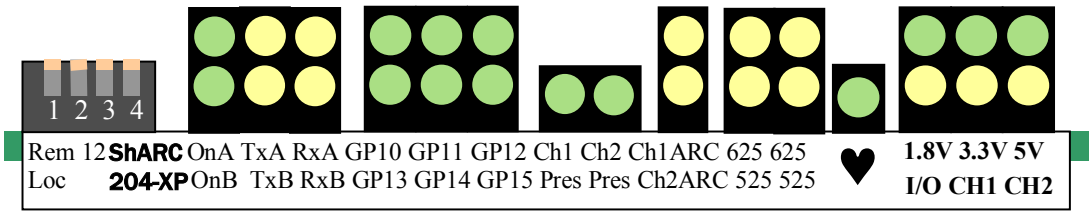
6 Trouble shooting

6.1 Card edge monitoring

Once the start-up initialisation procedure is complete (shown by the heartbeat LED going from steady state to flashing), the ShARC-XP can be controlled or configured from the card edge, from GPIs, from an active control panel or the Statesman PC interface. This chapter will concentrate on the card edge monitoring LEDs.

Status LEDs

Board edge LEDs provide status reporting and may be useful when fault finding.



ShARC-XP front view showing controls and LEDs

The following table summarises the card edge LED functions and colours:

Description	Colour	Status when illuminated
OnA	Green	Active front panel communications online.
TxA	Yellow	ShARC-XP transmitting to active front panel.
RxA	Yellow	ShARC-XP receiving from active front panel.
OnB	Green	Reserved communications channel online.
TxB	Yellow	ShARC-XP transmitting on reserved communications channel.
RxB	Yellow	ShARC-XP receiving on reserved communications channel.
GP10	Green	GPI input 0 shorted to ground. Channel 1 aspect ratio conversion on. (4:3 to 16:9)
GP11	Green	GPI input 1 shorted to ground. Channel 1 aspect ratio conversion on (16:9 to 4:3).
GP12	Green	GPI input 0 shorted to ground. Channel 2 aspect ratio conversion on. (4:3 to 16:9). ShARC204-XP only.
GP13	Green	GPI input 1 shorted to ground. Channel 2 aspect ratio conversion on. (16:9 to 4:3). ShARC204-XP only
GP14	Green	GPI input 4 shorted to ground. No effect. (GPI4 set to input)
GP15	Green	GPI input 5 shorted to ground. No effect. (GPI5 set to input)
Ch1 Pres	Green	Valid video input detected on Channel 1.
Ch2 Pres	Green	Valid video input detected on Channel 2 (ShARC204-XP only).
Ch1 ARC	Yellow	625 line input detected on Channel 1.
Ch2 ARC	Yellow	525 line input detected on Channel 1.
Ch1 625	Yellow	625 line input detected on Channel 1.
Ch1 525	Yellow	525 line input detected on Channel 1.
Ch2 625	Yellow	625 line input detected on Channel 2 (ShARC204-XP only).
Ch2 525	Yellow	525 line input detected on Channel 2 (ShARC204-XP only).
♥	Green	Heartbeat. When beating all processor functions are healthy.
I/O	Yellow	Input/output programmable logic configured.
CH1	Yellow	Channel 1 programmable logic configured.
CH2	Yellow	Channel 2 programmable logic configured. (ShARC204-XP only)
1.8V	Green	1.8V supply voltage present.
3.3V	Green	3.3V supply voltage present.
5V	Green	5V supply voltage present.

6.2 Fault finding guide

The power supply voltage LEDs are not illuminated

Check that the frame PSU is functioning – refer to the appropriate frame manual for detailed information.

There has been a failure of one or more of the on-board voltage regulators.

There is no video output

Check that a valid input is present (Input present LEDs ON) and that any cabling is intact.

There is no conversion in the video output

Check that the channel is not in Bypass. Neither Ch1ARC or Ch2ARC LEDs will be lit.

The card no longer responds to Statesman/front panel control

Check that the card is seated correctly and that all the Power LEDs are lit.

Check that the card edge Rx and Tx LEDS flash (Comms LED in an Indigo frame) when Statesman communication control is attempted.

Check any active control panel/Statesman cabling.

Check if the control panel/Statesman can control another card in the same rack.

If necessary re-set the card.

Statesman settings change unexpectedly

Active control panel or card edge control settings may have overridden Statesman settings if they were changed more recently.

Card edge settings have changed unexpectedly

Statesman or active control panel settings may have overridden card edge control settings if they were changed more recently.

Active control panel settings change unexpectedly

Statesman or card edge control settings may have overridden control panel settings if they were changed more recently.

Active control panel and/or Statesman does not work as expected

Check that a unique node address is being used in the frame the module is fitted within.

GPI control not working

Check that jumpers J1, J4, J16 and J17 are set for GPI control.

Re-setting the card

If required, the card may be reset by simply removing the rack power and re-applying power after a few seconds or by removing the card from the rack then re-inserting it. It is usually safe to reinsert the card whilst the rack is powered.

7 Specification

General

Dimensions	266mm x 100mm module with DIN 41612 connector
Weight	230g
Power consumption	8 Watts (ShARC102-XP), 8.4 Watts (ShARC204-XP)

Inputs

Video SDI inputs	One input with ShARC102-XP
	Two inputs with ShARC204-XP
	SDI 270Mbit to EBU 3267-E & SMPTE 259M
Cable equalisation	>200m Belden 8281 or equivalent
Line selection	Auto 625/525 line selection
Blanking	All data in the vertical and horizontal blanking interval is passed through unprocessed with full 10 bits. Therefore, the unit will pass through embedded audio and any ancillary data with a 10μs propagation delay.

Outputs

Video SDI outputs	One output with ShARC102-XP
	Two outputs with ShARC204-XP
ShARC102-XP	2 x 270Mb/s serial digital to EBU Tech 3267-E and SMPTE-259M
ShARC204-XP	4 x 270Mb/s serial digital to EBU Tech 3267-E and SMPTE-259M

Horizontal picture conversions	16:9 to 4:3 conversion stretches middle 75% of picture to fill whole screen
	4:3 to 16:9 conversion squashes picture to fill 75% of screen creating a pillarbox with black vertical bars.
	No vertical conversion
Frequency response	16:9 to 4:3 is virtually distortion free
	4:3 to 16:9 output frequency response 0 to 5.5MHz
	This corresponds to input frequencies of 0 to 4.1MHz
	The squashing of the picture raises the frequency spectrum of the picture and so the anti-aliasing filters can cause a loss of very fine detail
Delay through board	10μs
Picture processing	10 bit with 10 bit data path in horizontal and vertical blanking interval to allow embedded audio or data

GPI input levels

Active	Connect to ground
Inactive	High impedance or 5 Volts
Input current	<50uA

GPI inputs	Convert or bypass
	Stretch or squash
Local control	Conversion set by DIP switches
Remote control	Front panel control from frame active panel and remote panel
	Statesman allows control from any PC on a network

Ordering information

ShARC102-XP	Single channel 10 bit horizontal digital aspect ratio converter
ShARC204-XP	Dual channel 10 bit horizontal digital aspect ratio converter
Indigo 4	4U frame with passive front 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 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 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 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 ShARC-XPs in frame (24 in 4U, 12 in 2U, six in 1U, two in desk top box)
	Gives access to one input and two outputs on ShARC102-XP
	Gives access to two inputs with two outputs of each channel on ShARC204-XP
REMIND	19” remote control panel
Statesman	PC Control System