USER MANUAL

Indigo SYSTEM

CoolFlow

ALLDAC

12 bit broadcast encoding converter with distribution amplifier

Crystal Vision

Contents

Revision 1.   General update since original release   .   03/12/2007
Revision 2.   Specifications updated   .   07/07/2010

1 Introduction

ALLDAC is a 12 bit broadcast encoding converter with distribution amplifier that converts Standard Definition serial digital video into a flexible combination of analogue outputs that can be configured to give a variety of component and composite signals.

Up to four reclocked SDI input loop-throughs are also available.

As a part of its great flexibility ALLDAC can have its Y/C outputs configured to mimic Crystal Visions DDAA132 monitoring encoder or ENDAC encoder allowing ALLDAC to become a direct replacement in existing systems without a need for any re-wiring.

ALLDAC will fully integrate with any other interface or keying product from the Crystal Vision range. Further flexibility is afforded by the large choice of control options including board edge control, local or remote active control panel and the Statesman PC Control System.

- 12 bit digital encoder

- Flexible control, including PC software.

- Outputs configurable for composite plus YC, YUV and RGB

- Up to four reclocked SDI loop-throughs available

- Compact design for high packing density
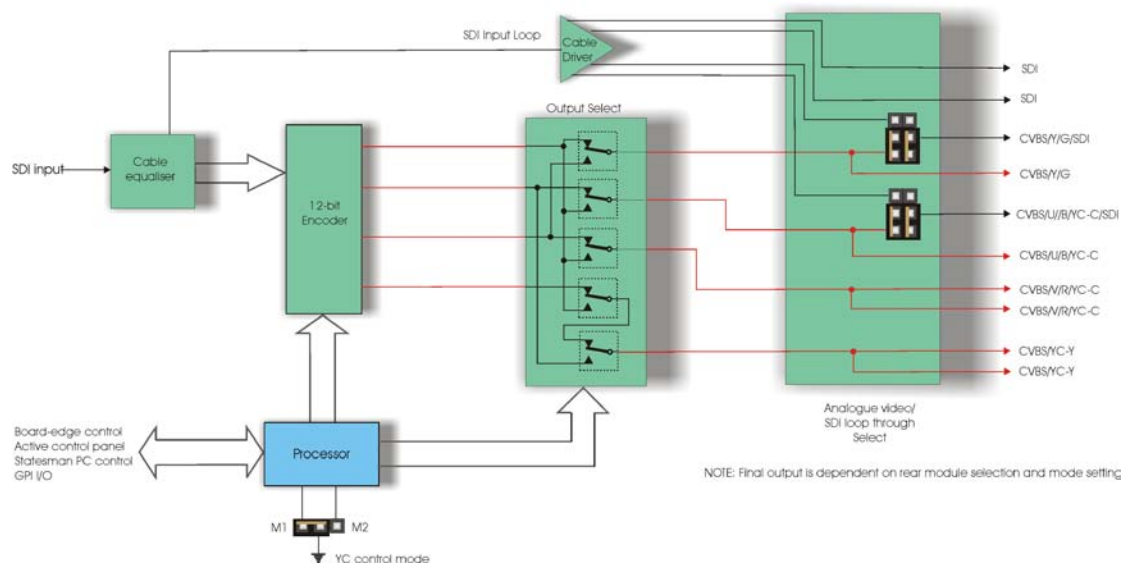
ALLDAC

ALLDAC is a 100mm x 266mm module that fits in Crystal Vision's four standard frame sizes - 24 modules fit in 4U, 12 modules fit in 2U, six in 1U or two in a desktop box. There are a range of rear connector modules available for the ALLDAC which allow the system builder great flexibility in frame configuration.

1.1 Operating modes

YC control mode

ALLDAC has been given two selectable output modes, M1 and M2. These output modes are used to configure the YC routing when YC is selected as an output format. ALLDAC will usually operated in mode 1 which, should it be necessary, will allow it to be used as a plug-in replacement for the DDAA132 monitoring encoder. Mode M2 will reconfigure the YC output routing to suit an existing frame previously wired for an ENDAC. The YC control mode is selected by an on-board link.

Analogue video formats

There are eight analogue video outputs and four SDI loop-throughs of which two are fixed serial digital outputs. All video outputs apart from the two fixed ones can be configured using on-board links and board edge menus to produce a selection of composite, YC, component RGB or YUV. The output standard is determined by the input which auto detects between 625-line and 525-line rate.

Data in the VBI (vertical blanking interval) is always passed to the analogue composite output. The addition of a 7.5% IRE set up is also selectable by onboard link and is active when outputting an NTSC format signal.

Betacam signal levels can also be selected for a 525-line component YUV output.

This makes ALLDAC ideal for all monitoring applications and for broadcast applications which do not require a TBC or the ability to time the sub-carrier reference.

Status and control

Status and control is available using the board edge menu selection switches and LEDs.

Status reporting is also available from an active frame front or remote active control panel as well as Crystal Visions Statesman PC controller package.

2 Hardware installation

The ALLDAC single height module uses the RM01, which will fit into all Crystal Vision rack frames. All modules can be plugged in and removed while the frame is powered without damage.

The ALLDAC can also be used with several other rear modules such as the quad height RM02 and double height RM18 to obtain a greater range of outputs but at reduced packing density.

2.1 Rear modules and signal I/O

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

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

Rear module connections with RM01

The RM01being a single height module will allow maximum packing density but with the maximum number of outputs reduced.

RM01 rear module connector	Description
	RM01 • 24 ALLDAC modules per Indigo 4 frame • 12 per Indigo 2 frame • Six per Indigo 1 frame • 2 per Indigo DT • All frame slots can be used

BNC	I/O assignment
OUT 4	Component R / V or CVBS and YC-C composite output (selectable by output mode)
SDI IN	Serial digital input
SD IN LOOP	Reclocked SDI input loop-through
OUT1	Serial digital, component G / Y or CVBS and YC-Y composite output (selectable by output mode and board link PL2)
OUT2	Serial digital, component B / U, YC-C or CVBS output (selectable by output mode and board link PL3)
OUT3	CVBS and YC-Y composite outputs (selectable by output mode)

Rear module connections with RM02

The RM02 is a 2U high rear module so will only fit the Indigo 2 and Indigo 4 frames, and will allow three cards to be fitted per bay. The benefit from using this rear module is in its increased number of connections per card allowing up to four input loop-throughs and or multiple analogue outputs simultaneously.

RM02 rear module connector	Description
	RM02 • 18 ALLDAC modules per Indigo 4 frame • 9 per Indigo 2 frame • Slots 1, 2 and 4 can be used

BNC	I/O assignment
SD IN LOOP	Reclocked SDI input loop-through
SDI IN	Serial digital input
OUT1	Serial digital, component G / Y or CVBS and YC-Y composite output (selectable by output mode and board link PL2)
SD IN LOOP	Reclocked SDI input loop-through
OUT2	Serial digital, component B / U or CVBS and YC-C composite output (selectable by output mode and board link PL3)
OUT4A	Component R / V or CVBS and YC-C composite output (selectable by output mode)
OUT4B	Component R / V or CVBS and YC-C composite output (selectable by output mode)
OUT3A	CVBS and YC-Y composite outputs (selectable by output mode)
OUT3B	CVBS and YC-Y composite outputs (selectable by output mode)

Rear module connections with RM18

The RM18 is a double height rear module which will fit all Indigo frames. The ALLDAC is fitted in the upper slot of the pair and gives the maximum number of outputs available.

RM18 rear module connector	Description
	RM18 • 12 ALLDAC modules per Indigo 4 frame • Six per Indigo 2 frame • Three per Indigo 1 frame • One per Indigo DT • Alternate frame slots are used

BNC	I/O assignment
OUT 5	Component B / U or CVBS and YC-C composite output (selectable by output mode)
SDI IN	Serial digital input
SD IN LOOP	Reclocked SDI input loop-through
OUT4A	Component R / V or CVBS and YC-C composite output (selectable by output mode)
OUT3A	CVBS and YC-Y composite outputs (selectable by output mode)
OUT3B	CVBS and YC-Y composite outputs (selectable by output mode)
OUT6	Component G / Y or CVBS and YC-Y composite output (selectable by output mode)
OUT1	Serial digital, component G / Y or CVBS and YC-Y composite output (selectable by output mode and board link PL2)
SD IN LOOP	Reclocked SDI input loop-through
OUT2	Serial digital, component B / U or CVBS and YC-C composite output (selectable by output mode and board link PL3)
NC	No user connection
OUT4B	Component R / V or CVBS and YC-C composite output (selectable by output mode)

Mode selection

The following tables list output configurations for the RM01, RM02 and RM18 in both modes M1 and M2.

RM01 mode selection I/O assignments

BNC				Mode M1	Mode M2
	CVBS	YUV	RGB	YC	YC
OUT 4	CVBS	V	R	CVBS	YC-C
SDI IN	SDI IN	SDI IN	SDI IN	SDI IN	SDI IN
SDI LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
*OUT1	CVBS	Y	G	YC-Y	CVBS
*OUT2	CVBS	U	B	YC-C	CVBS
OUT3	CVBS	CVBS	CVBS	CVBS	YC-Y

*Note: BNCs marked by an asterisk can be selected by using PL2 and PL3 to give SDI loop-throughs or analogue outputs.

RM02 mode selection I/O assignments

BNC				Mode M1	Mode M2
	CVBS	YUV	RGB	YC	YC
SD IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
SDI IN	SDI IN	SDI IN	SDI IN	SDI IN	SDI IN
*OUT1	CVBS	Y	G	CVBS	YC-Y
SD IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
*OUT2	CVBS	U	B	CVBS	YC-C
OUT4A	CVBS	V	R	YC-C	CVBS
OUT4B	CVBS	V	R	YC-C	CVBS
OUT3A	CVBS	CVBS	CVBS	YC-Y	CVBS
OUT3B	CVBS	CVBS	CVBS	YC-Y	CVBS

*Note: BNCs marked by an asterisk can be selected by using PL2 and PL3 to give SDI loop-throughs or analogue outputs.

RM18 mode selection I/O assignments

BNC	CVBS	YUV	RGB	Mode M1 YC	Mode M2 YC
OUT 5	CVBS	U	B	CVBS	YC-C
SDI IN	SDI IN	SDI IN	SDI IN	SDI IN	SDI IN
SD IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
OUT4A	CVBS	V	R	YC-C	CVBS
UT3A	CVBS	CVBS	CVBS	YC-Y	CVBS
OUT3B	CVBS	CVBS	CVBS	YC-Y	CVBS
OUT6	CVBS	Y	G	CVBS	YC-Y
*OUT1	CVBS	Y	G	CVBS	YC-Y
SD IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
*OUT2	CVBS	U	B	CVBS	YC-C
NC	NC	NC	NC	NC	NC
OUT4B	CVBS	V	R	YC-C	CVBS

*Note: BNCs marked by an asterisk can be selected by using PL2 and PL3 to give SDI loop-throughs or analogue outputs.

Module configuration

The ALLDAC has four user selectable jumper links which along with S2 and S3 are used to configure the output formats.

There are also four preset potentiometers. These are factory set and should not require any adjustment.

Note: Not all input/output combinations are available with all rear modules.
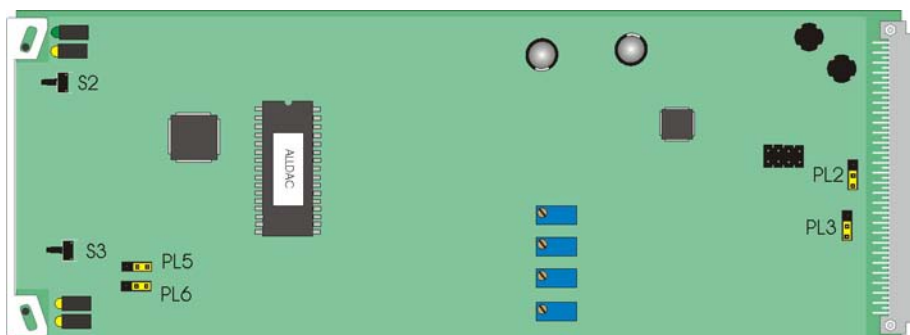
G / Y / YC-Y / SDI OUT port configuration

The Component G / Y / YC-C / SDI OUT port can be configured by setting the position of link PL2 (to be found at the middle right hand edge of the module). When an analogue output is required set jumper link PL2 to its lower position. Set jumper PL2 to its upper position when a further SDI output is required.

B / U / YC-C / SDI OUT port configuration

The Component B / U / YC-C / SDI OUT port can be configured by setting the position of link PL3 (to be found at the middle right hand edge of the module below PL2). When an analogue output is required set jumper link PL3 to its lower position. Set jumper PL3 to its upper position when a further SDI output is required.

NTSC-M / NTSC-J

A 7.5 IRE pedestal can be added to the analogue outputs by setting PL6 towards the front of the card, NTSC-M mode. Setting PL6 towards the rear of the card disables the pedestal for NTSC-J mode.

YC control mode

Mode M1 is set by PL5 being place towards the front of the card. In this position the output routing is similar to the DDAA132 monitoring encoder. Setting PL5 away from the card front will configure the outputs to be similar to the ENDAC encoder (mode M2).

2.2 General Purpose Interface (GPI)

Each frame slot has up to six connections 'a-f 'for GPI control and monitoring. These connections are available at the rear of the frame on the 26-way D type Remote connectors.

GPI			Low (<1V)	High (+5V)
1*	**'a'**	**Loss of input (duplicate)**	Input missing or invalid	Input OK
2	**'b'**		No user connection at present	
3	**'c'**		No user connection at present	
4	**'d'**		No user connection at present	
5	**'e'**	**Loss of input**	Input missing or invalid	Input OK
6	**'f'**		No user connection at present	

As supplied, each GPI output has a 270Ω resistor in series with its output. This allows for an external LED to be driven, connected to a DC voltage of +5V.

*Note: For Issue 3 onwards PCBs, the Input missing alarm is available on GPI5. This alarm will remain duplicated on GPI1 for existing installations.

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	Upper	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)
Slot no.		**'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	Lower	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)

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. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.

Remote 2, Remote 4, Remote 6 and Remote 8 are 26 way high-density D-Type male plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2 and Remote 6.

Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1A. Remotes 5-8 are similarly protected.

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. 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 in each case and +5V @500mA is pin 15 on Remote 2.

Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1A.

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 female socket. Frame ground is pin 2 and +5V @500mA is pin 1.

Remote 2: 26 way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15. Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-2 to approximately 1A.

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 female socket. Frame ground is pin 2 and +5V @500mA is pin 1.

Remote 2: 26 way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15

Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-2 to approximately 1A.

3 Card edge operation

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

Front view of ALLDAC showing controls and LEDs

Card edge buttons

The two tactile push button switches allow the operator to navigate within the menu structure.

Button	Function	
Betacam	Sets the YUV output level to be Betacam compliant	Press to set Betacam levels. Press again to set normal levels Only active when output is set to YUV 525-lines
Output Format	Selects output format	Press OP Format repeatedly to toggle through the available output formats. CVBS, YUV, RGB, YC in turn.

Reading card edge LEDs

Card edge LEDs may be used in conjunction with status information from any connected remote status panel display or from Statesman if available.

Refer also to the trouble shooting chapter for more help with solving problems and monitoring status information.

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

Name	LED Colour	Function when ON	Function when Off
PSU	Green	Good power supply (PSU) rails	One or more of the monitor supplies is out of specification
Beta	Yellow	525-line component Betacam output levels selected	Normal output levels selected
625	Yellow	625-line input present	Input not present
525	Yellow	525-line input present	
CVBS	Yellow	CVBS output selected	See note
YUV	Yellow	YUV output selected	
RGB	Yellow	RGB output selected	
Y/C	Yellow	Y/C output selected	

Note: Additional CVBS outputs may be available depending on the choice of rear module.

4   Using the active front panel

4.1 Module selected

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

Note: It is **ESSENTIAL** that the Panel set up 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 keys 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 set up 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 – accept 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.

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

Selecting ALLDAC

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 1.

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

The message shows that an ALLDAC has been selected.

The ALLDAC 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.

The ALLDAC menu structure

The main top-level menu will give access to all sub-level menus. The Home menu can be reached from any point in the sub-level menus by pressing the Home button. Menu keys are illuminated when active and when further menus are available.

Pressing the Function keys F1, F2 and F4 accesses the ALLDAC's sub menus. Where further selections are available rotate the shaft control to navigate them. An adjacent LED illuminated indicates an active key. All key presses and numeric value changes are implemented immediately.

The following chart shows the available ALLDAC menus. The actual menus available may vary slightly as software is updated.
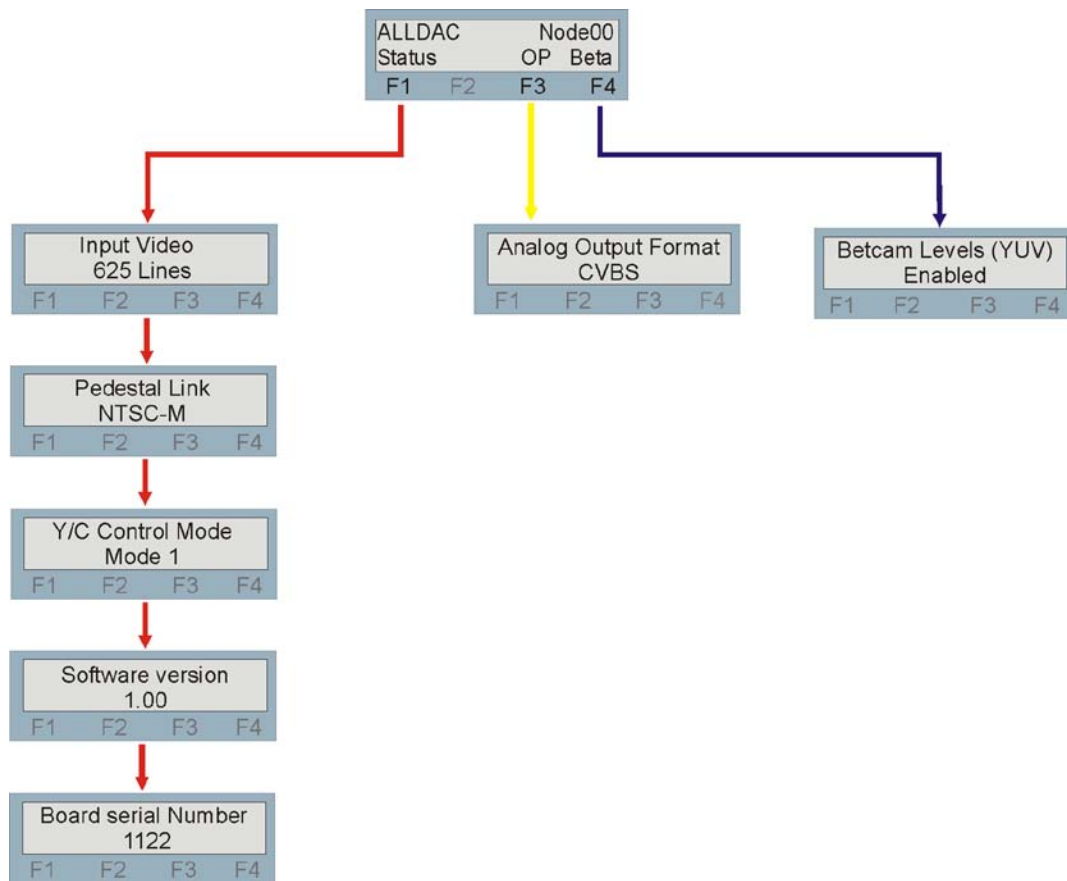
The ALLDAC menu tree

Note: Function key LEDs are illuminated when active.

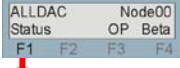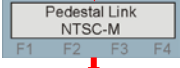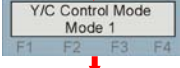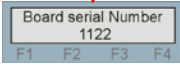A more detailed description of the individual menus follows.

Home Menu

There are three sub menus available from the home menu, they are: Status, Output and Beta. Pressing F1 Input leads to input status, link settings and engineering information. Output F3 contains the analogue output format configurations and F4 Betacam status. The Home menu also contains information about the type of card and its position in the frame.

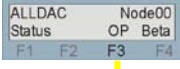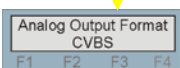|	Menu	Comment
	Home	Card type and frame position. Access to sub menus. Press F1 to access the Status menu. Press F3 to access the Output menu. Press F4 to access the Betacam menu.

Status Menu

The Status menu shows the input video standard, operating mode and engineering information. This information is scrolled through by rotating the shaft control.

	Menu	Comment
Input Video 625 Lines	Input video status	Press button F1 in the home menu to access the status information. *625 Lines, 525 Lines, No present*
Pedestal Link NTSC-M	NTSC set up status	Rotate the shaft control to view the pedestal link setting (NTSC only). *NTSC-M, NTSC-J, N/A*
Y/C Control Mode Mode 1	Operating mode selected	Rotate the shaft control to view the YC control mode link setting. *Mode 1, Mode 2*
Software version 1.00	Current board software fitted	Rotate the shaft control to view the current software version fitted.
Board serial Number 1122	Electronically store board serial number	Rotate the shaft control to view the board serial number electronically stored.

Output Menu
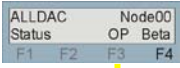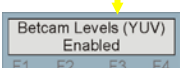
This menu gives access to the output configuration controls.

	Menu	Comment
Analog Output Format CVBS	Output video Format selected	Press button F3 in the home menu to access the output video format. Rotate the shaft control to select. Press ENTER to confirm. *CVBS, YUV, RGB, Y/C*

Beta Menu

This menu indicates the status of the Betacam selection control.

	Menu	Comment
Betcam Levels (YUV) Enabled	Output video Format selected	Press button F4 in the home menu to access the Betacam status menu. Rotate the shaft control to select. Press ENTER to confirm. *Enabled, Not Enabled, Not a valid control.*

Note: The Betacam control is only active when an NTSC input is present and the output is set to YUV. This control will also cause a reduction of approximately 8% in the UV levels of the simultaneously available CVBS outputs when active.

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 a LCD display. Statesman will not 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 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 size 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.
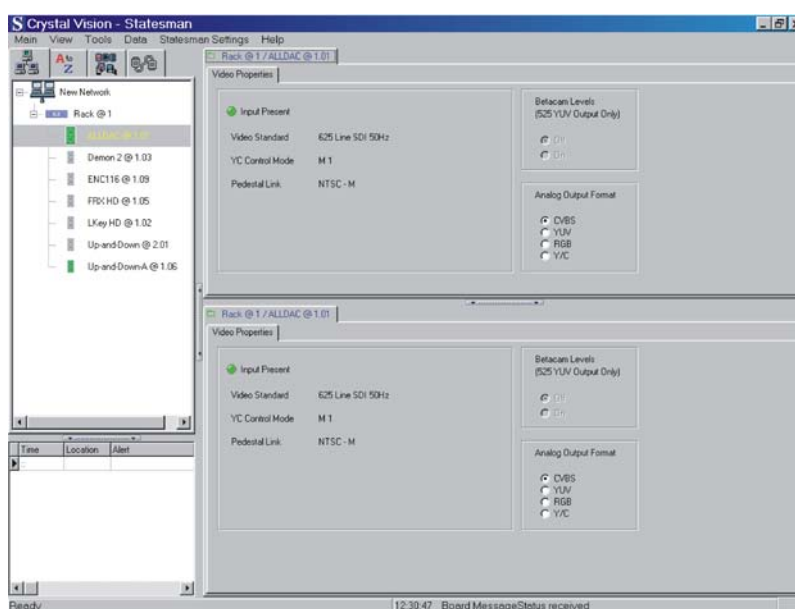
Statesman main application window

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.

Video properties

The Statesman tab is divided into three group boxes - Status, Betacam select and Analogue Output Format.
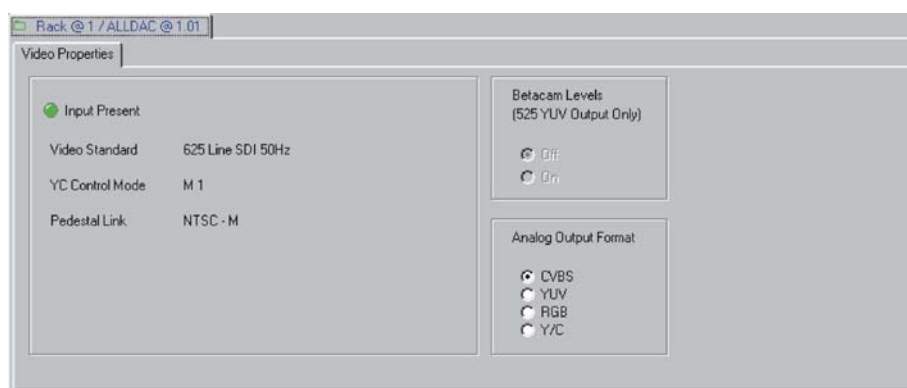
ALLDAC video properties

Status

Input present is indicated by a simulated LED. The LED will show green when an input is present and will turn red as a warning should the input fail.

ALLDAC will automatically detect the input video standard and Statesman will display this information.

The position of both the pedestal select link PL6 and YC control mode link PL5 is also given.

Betacam levels

In 525-line YUV output mode the ALLDAC is able to output in Betacam levels where the U and V components are increased by 1.333.

Note: The Betacam control is only active when an NTSC input is present and the output is set to YUV. This control will also cause a reduction of approximately 8% in the UV levels of the simultaneously available CVBS outputs when active.

Analogue Output format

The ALLDAC can be configured to output four analogue video formats, CVBS, YUV, RGB and Y/C.

6 Trouble shooting.

6.1 Card edge monitoring

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

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

Name	LED Colour	Function when ON	Function when Off
PSU	Green	Good power supply (PSU) rails	One or more of the monitor supplies is out of specification
Beta	Yellow	525-line component Betacam output levels selected	Normal output levels selected
625	Yellow	625-line input present	Input not present
525	Yellow	525-line input present	
CVBS	Yellow	CVBS output selected	See note
YUV	Yellow	YUV output selected	
RGB	Yellow	RGB output selected	
Y/C	Yellow	Y/C output selected	

6.2 Fault finding guide

The Power OK LED is not illuminated

Check that the frame PSU is functioning and the ALLDAC is fully inserted into its slot– refer to the appropriate frame manual for detailed information.

There is no video output

Check that a valid serial digital video input is present and appropriate output format selected. Check that all cabling is intact.

The video output exhibits jitter

Check that the input video stability is within normal limits and that the maximum cable length has not been exceeded.

The card no longer responds to Statesman or front panel control

Check that the card is seated correctly and that the power OK LED is lit.

Check any active control panel cabling.

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

If necessary re-set the card by simply removing the card from the rack and then re-inserting the card.

Output formats not as expected

Check the position of the YC control mode link PL5 and the positions of links PL2 and PL3.
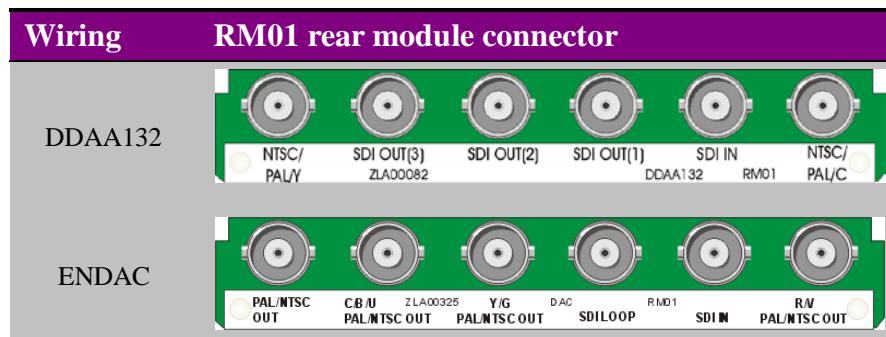
7   Appendix

The ALLDAC can be used in existing systems to replace for service purposes or upgrade both the DDAA132 monitoring encoder and the ENDAC encoder with no change to the wiring.

7.1   DDAA132/ENDAC compatibility

If replacing an ENDAC it will be necessary to set the on-board YC control mode selection link PL5 to mode M2 which will correctly route the YC outputs should they be required. The DDAA132 compatibility mode is M1.

RM01 connection details

Wiring	RM01 rear module connector	
DDAA132	NTSC/PAL/Y SDI OUT(3) ZLA00082 SDI OUT(2) SDI OUT(1) SDI IN DDAA132 RM01 NTSC/PAL/C	
ENDAC	PAL/NTSC OUT C.B/U PAL/NTSC OUT ZLA00325 Y/G PAL/NTSC OUT DAC SDILOOP RM01 SDI IN R/V PAL/NTSC OUT	

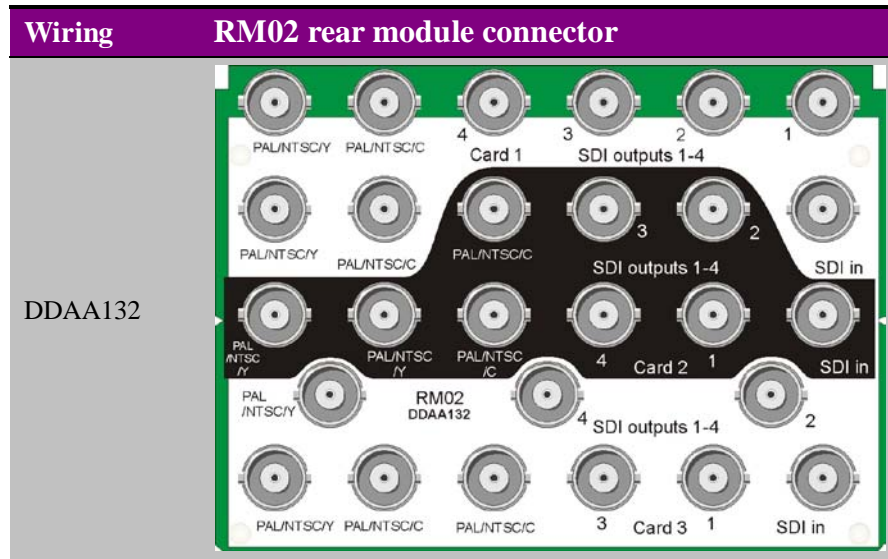| BNC		I/O assignment
Mode M1 (DDAA132)	**Mode M2 (ENDAC)**	
NTSC/ PAL/C	R/V PAL/NTSC OUT	Component R / V or CVBS and YC-C composite output (selectable by output format and mode)
SDI IN	SDI IN	Serial digital input
SDI OUT (1)	SDI LOOP	Reclocked SDI input loop-through
SDI OUT (2)	Y/G PAL/NTSC OUT	Serial digital, component G / Y or CVBS and YC-Y composite output (selectable by output format, mode and board link PL2)
SDI OUT (3)	C/B/U PAL/NTSC OUT	Serial digital, component B / U, YC-C or CVBS output (selectable by output format, mode and board link PL3)
NTSC/ PAL/Y	PAL/NTSC OUT	CVBS and YC-Y composite outputs (selectable by output format and mode)

RM01 I/O assignments

| BNC | DDAA132 (mode M1) | | | |
	CVBS	YUV	RGB	Y/C
NTSC/ PAL/C	CVBS	V	R	CVBS
SDI IN	SDI IN	SDI IN	SDI IN	SDI IN
SDI OUT (1)	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
*SDI OUT (2)	CVBS	Y	G	YC-Y
*SDI OUT (3)	CVBS	U	B	YC-C
NTSC/ PAL/Y	CVBS	CVBS	CVBS	CVBS

| BNC | ENDAC (modeM2) | | | |
	CVBS	YUV	RGB	Y/C
R/V/PAL/NTSC OUT	CVBS	V	R	YC-C
SDI IN	SDI IN	SDI IN	SDI IN	SDI IN
SDI LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
*Y/G/PAL/NTSC OUT	CVBS	Y	G	CVBS
*C/B/U/PAL/NTSC OUT	CVBS	U	B	CVBS
PAL/NTSC OUT	CVBS	CVBS	CVBS	YC-Y

*Note: BNCs marked by an asterisk can be selected by using PL2 and PL3 to give SDI loop
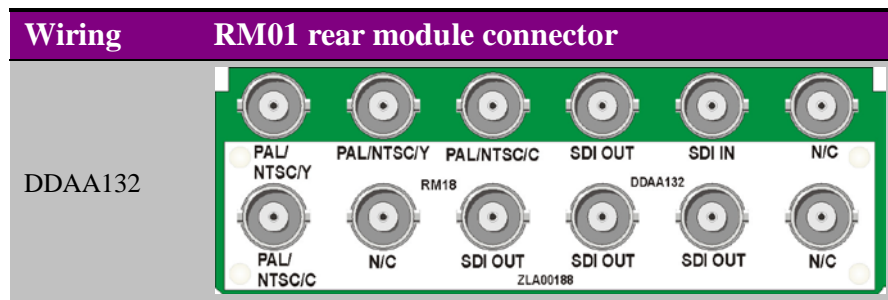throughs or analogue outputs.

RM02 connection details

Wiring	RM02 rear module connector
DDAA132	

I/O assignment	
DDAA132 (mode M1)	
1	Reclocked SDI input loop-through
SDI IN	Serial digital input
2	Serial digital, component G / Y or CVBS and YC-Y composite output (Mode 1 selected and board link PL2)
3	Reclocked SDI input loop-through
4	Serial digital, component B / U or CVBS and YC-C composite output (Mode 1 and board link PL3)
PAL/NTSC/C	Component R / V or CVBS and YC-C composite output (Mode 1 selected)
PAL/NTSC/C	Component R / V or CVBS and YC-C composite output (mode)
PAL/NTSC/Y	CVBS and YC-Y composite outputs (selectable by output mode)
PAL/NTSC/Y	CVBS and YC-Y composite outputs (selectable by output mode)

RM02 I/O assignments

	DDAA132 (mode M1)			
BNC	**CVBS**	**YUV**	**RGB**	**Y/C**
1	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
SDI IN	SDI IN	SDI IN	SDI IN	SDI IN
*2	CVBS	Y	G	CVBS
3	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
*4	CVBS	U	B	CVBS
PAL/NTSC/C	CVBS	V	R	YC-C
PAL/NTSC/C	CVBS	V	R	YC-C
PAL/NTSC/Y	CVBS	CVBS	CVBS	YC-Y
PAL/NTSC/Y	CVBS	CVBS	CVBS	YC-Y

*Note: BNCs marked by an asterisk can be selected by using PL2 and PL3 to give SDI loop throughs or analogue outputs.

RM18 connection details

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Wiring	RM01 rear module connector
DDAA132	

BNC DDAA132 (mode M1)	I/O assignment
N/C	Component B / U or CVBS and YC-C composite output (selectable by output mode)
SDI IN	Serial digital input
SDI OUT	Reclocked SDI input loop-through
PAL/NTSC/C	Component R / V or CVBS and YC-C composite output (selectable by output mode)
PAL/NTSC/Y	CVBS and YC-Y composite outputs (selectable by output mode)
PAL/NTSC/Y	CVBS and YC-Y composite outputs (selectable by output mode)
N/C	Component G / Y or CVBS and YC-Y composite output (selectable by output mode)
SDI OUT	Serial digital, component G / Y or CVBS and YC-Y composite output (selectable by output mode and board link PL2)
SDI OUT	Reclocked SDI input loop-through
SDI OUT	Serial digital, component B / U or CVBS and YC-C composite output (selectable by output mode and board link PL3)
N/C	No user connection
PAL/NTSC/C	Component R / V or CVBS and YC-C composite output (selectable by output mode)

RM18 I/O assignments

BNC	DDAA132 (mode M1)			
	CVBS	YUV	RGB	Y/C
N/C	CVBS	U	B	CVBS
SDI IN	SDI IN	SDI IN	SDI IN	SDI IN
SDI OUT	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
PAL/NTSC/C	CVBS	V	R	YC-C
PAL/NTSC/Y	CVBS	CVBS	CVBS	YC-Y
PAL/NTSC/Y	CVBS	CVBS	CVBS	YC-Y
N/C	CVBS	Y	G	CVBS
*SDI OUT	CVBS	Y	G	CVBS
SDI OUT	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP	SDI IN LOOP
*SDI OUT	CVBS	U	B	CVBS
N/C	NC	NC	NC	NC
PAL/NTSC/C	CVBS	V	R	YC-C

*Note: BNCs marked by an asterisk can be selected by using PL2 and PL3 to give SDI loop throughs or analogue outputs.

8   Specification

General

Dimensions	100 mm x 266 mm module with DIN 41612 connector
Weight	160g
Power consumption	5 W

Inputs

270Mb/s serial digital to EBU Tech 3267-E and SMPTE-259M.

Cable equalisation >200m Belden 8281 or equivalent.

Input return loss >15dB at 270Mbs

Outputs

Up to 8 x CVBS, 4 x YC, 2 x YUV/RGB and 4 x SDI input loop-through. The final number is rear module dependent.

Output return loss >35db up to 5.5Mhz

Conversion Performance

Sampling	12-bit precision
Frequency response	± 0.14dB to 5.5MHz (PAL/NTSC output)
	Frequency response with YUV output:
	Y=0.15dB to 5.5Mhz
	UV=0.8dB to 2.75Mhz
Gain error	<1.0%
Differential phase	<1.5%
Differential gain	<1.0%
Signal to noise	<-60dB

Control and status

Control	Board edge control using push button switches movable links and LEDs, active control panel or Statesman PC control software.
GPI Alarm	Input absent
	Electrically: Open drain FET 30V, 220Ω current limit resistors. Pulled up to +5V through 10kΩ.
LEDs	PSU okay, Betacam levels selected, input standard and output format.