

digital keying modular
interface audio
converters analogue video

Dual DL-3G

Dual channel dual link
to single link converter

USER MANUAL



Contents

1	Introduction	3
2	Hardware installation	4
2.1	Module configuration	4
2.2	Rear modules and signal I/O	5
	Rear module connections with RM50	5
3	Card edge operation	6
3.1	Card edge controls	6
3.2	Card edge buttons	6
3.3	Card edge rotary control	6
3.4	Reading card edge LEDs	7
3.5	Navigating card edge menus	7
3.6	Card edge configuration	8
	Menu tree	8
	Status menu	9
	Output level menu	10
4	Using the front control panel	11
4.1	Module selection	11
4.2	The Dual DL-3G active panel menu structure	13
	Active control panel menus	13
	The Status menu	14
	Output level menu	15
5	Statesman	16
5.1	Statesman operation	16

	Status	17
6	Trouble shooting	18
	Basic fault finding guide	19
7	Specification	20

1 Introduction

The Dual DL-3G is a dual link to 3G converter for interfacing between 1080p dual link and 3Gb/s equipment. It takes two 1.5Gb/s dual link signals or two separate co-timed HD signals and combines them into a single 3Gb/s signal

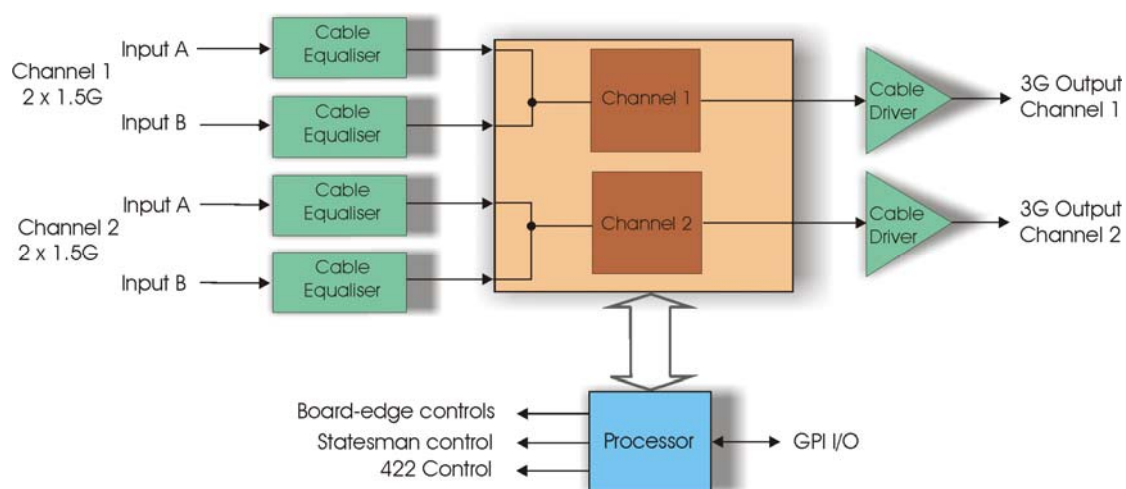
The two co-timed HD signals could be the left and right pictures from an HD 3D programme which come from a pair of cameras looking at the same scene. The Dual DL-3G allows two 3D images to be combined and put down the same wire so they go the same route and stay together

The Dual DL-3G can cope with a 12 sample timing difference between the links.

There are two independent channels on the board meaning two conversions can be performed

The Dual DL-3G is designed mainly for use with Level B 3Gb/s signals. Although it will work with Level A signals which do not contain audio or other embedded data.

The Dual DL-3G has user controllable selection of level A or B for its outputs and the VPID status of the input video is indicated.



The Dual DL-3G card can be controlled by Statesman PC control software, active control panel such as the REMIND-E, or from its card edge controls.

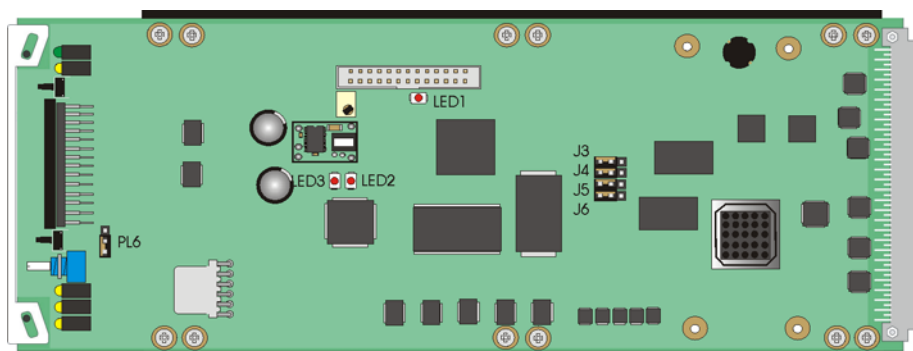
The main features of Dual DL-3G are:

- Two independent 3G HD channels
- VPID status indication
- Board-edge, Statesman and GPI alarm indication
- Space-saving: 100mm x 266mm module allowing 24 Dual DL-3G boards in 4U

2 Hardware installation

The Dual DL-3G single height module is used with the RM50 rear connector, which will fit into all Crystal Vision rack frames. All modules can be connected or removed while the frame is powered, without damaging the board.

2.1 Module configuration



Dual DL-3G

Link configuration and LEDs

There are 5 jumper links and three surface-mounted LEDs on the Dual DL-3G. The surface-mounted LEDs are not visible from the front of the frame and are included for diagnostic purposes only.

Comment				
J3-6	GPI control	←	422 comms	→
PL8	1-2 (lower) selected IP address. 2-3 (upper) forced IP address 10-0-0-201			
LED1	CPU configuration in progress			
LED2	Ethernet Data			
LED3	Ethernet Link			

Note: Links J3-6 have been factory set and should not require reconfiguring.


2.2 Rear modules and signal I/O

The 4U Indigo 4 frame will house up to 24 single height modules with up to three power supplies. The 2U Indigo 2 frame will house up to 12 single height modules and dual power supplies. The 1U Indigo 1 frame will house 6 single height modules and a single power supply. The Indigo DT desk top box has a built-in power supply and will house up to two single height modules.

The rear module for the Dual DL-3G is the RM50 or RM34.

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

Rear module connections with RM50

RM50 fits in all frames	Description
	RM50 <ul style="list-style-type: none"> • 24 Dual DL-3G modules per Indigo 4 frame • 12 per Indigo 2 frame • 6 per Indigo 1 frame • 2 per Indigo DT • All frame slots can be used

RM50 BNC	I/O assignment
INPUT 1A	Channel 1 1.5G SDI input (link A)
INPUT 2A	Channel 2 1.5G SDI input (link A)
INPUT 2B	Channel 2 1.5G SDI input (link B)
INPUT 1B	Channel 1 1.5G SDI input (link B)
3G OUT 1	Channel 1 3G Serial Digital output
3G OUT 2	Channel 2 3G Serial Digital output

Note: As the connections to the RM34 are identical to the RM50 they have not been repeated here.

3 Card edge operation

The card front is provided with a 10-digit display and push switches to navigate the control and status menus. LEDs are provided to give indication of power rail monitoring and the switch configuration.

3.1 Card edge controls



Dual DL-3G card front edge view

3.2 Card edge buttons

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

Button	Function	Normal state Up, Action Down
	Up Menu	Push to jump up a menu level or cancel a selection
ENTER	Select/Action	Push to select a menu and to action and confirm a change

3.3 Card edge rotary control

The board edge rotary encoder is used to navigate through the menu categories and adjust parameter values.

Control	Function
SCROLL /ADJUST	Rotate SCROLL to identify a menu category. In combination with the ENTER button select and ADJUST to change the current level or select a further option

Notes: The rotary control can access menus and parameter values by clockwise or anti-clockwise rotation.

3.4 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
	Yellow	Not currently supported	
IP 1A	Yellow	Input 1A present	Input not present
IP 1B	Yellow	Input 1B present	Input not present
IP 2A	Yellow	Input 2A present	Input not present
IP 2B	Yellow	Input 2B present	Input not present
Ch1A	Yellow	Channel 1 is Level A	
Ch1B	Yellow	Channel 1 is Level B	
Ch2A	Yellow	Channel 2 is Level A	
Ch2B	Yellow	Channel 2 is Level B	

3.5 Navigating card edge menus

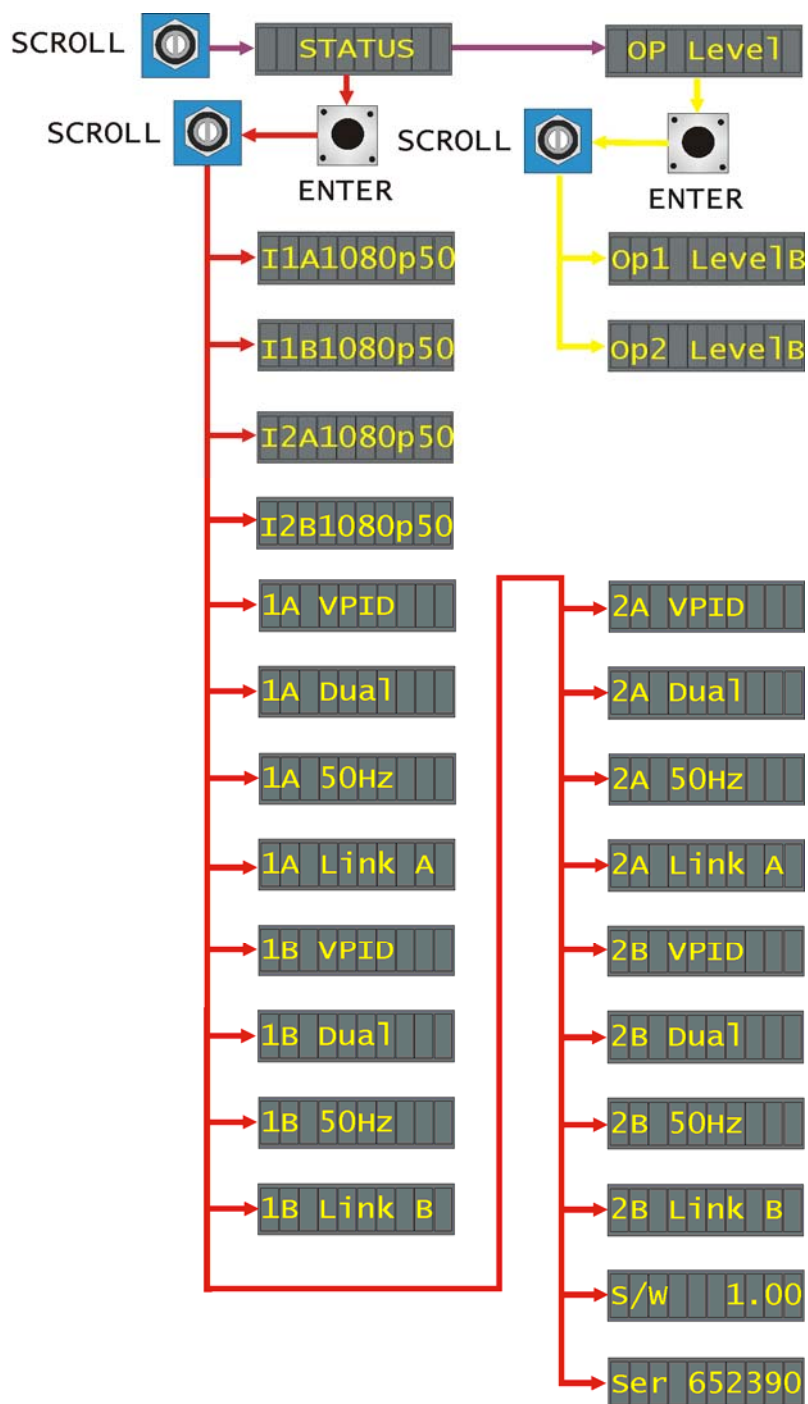
To access the card edge menu system proceed as follows:

- Press the up-arrow [↑] until a top menu category is reached
- Rotate the SCROLL control until the desired menu category is found
- Push ENTER to enter the sub menus of that category
- Rotate SCROLL to select a sub menu
- Push ENTER to select the desired function. Selection will be indicated by the text being displayed in *italic* text
- Rotate ADJUST to make the desired change to the selected parameter. The display brightness will flash slowly to indicate that a change has been made and requires confirmation
- Push ENTER to action the change. The display will cease flashing
- Use the up-arrow [↑] and SCROLL control to navigate to further menus

Notes: The displayed menu brightness will flash slowly if confirmation of a change is required.

3.6 Card edge configuration

Menu tree








Tip: To reach the top menu push the button repeatedly until a top menu is reached. Rotate the SCROLL control anti-clockwise until the Status menu appears.

Status menu

From the Status top menu press ENTER to access the Status menu list. Rotating the SCROLL/ADJ control will display the available status information.




STATUS	Menu	Comment
I1A1080p50	Input 1 Ch A video format	The input 1 channel A video format is shown. 1080p 50/59.94/60, Invalid, Missing.
I1B1080p50	Input 1 Ch B video format	The input 1 channel B video format is shown. 1080p 50/59.94/60, Invalid, Missing.
I2A1080p50	Input 2 Ch A video format	The input 2 channel A video format is shown. 1080p 50/59.94/60, Invalid, Missing.
I2B1080p50	Input 2 Ch B video format	The input 2 channel B video format is shown. 1080p 50/59.94/60, Invalid, Missing.
1A VPID	Input 1 Ch A VPID Status	The input 1 channel A video payload identifier status is shown. VPID, No VPID.
1A Dual	Input 1 Ch A link format	The input 1 channel A link format is shown. Dual. Not Dual.
1A 50Hz	Input 1 Ch A frame rate	The input 1 channel A video frame rate is shown. 50Hz, 59.94Hz, 60Hz.
1A Link A	Input 1 Ch A link identifier	The input 1 channel A link identifier is shown. Link A, Link B.
1B VPID	Input 1 Ch B VPID Status	The input 1 channel B video payload identifier is shown. VPID, No VPID.
1B Dual	Input 1 Ch B link format	The input 1 channel B link format is shown. Dual. Not Dual.
1B 50Hz	Input 1 Ch B frame rate	The input 1 channel B video frame rate is shown. 50Hz, 59.94Hz, 60Hz.
1B Link B	Input 1 Ch B link identifier	The input 1 channel B link identifier is shown. Link A, Link B.
2A VPID	Input 2 Ch A VPID Status	The input 2 channel A video payload identifier is shown. VPID, No VPID.
2A Dual	Input 2 Ch A link format	The input 2 channel A link format is shown. Dual. Not Dual.
2A 50Hz	Input 2 Ch A frame rate	The input 2 channel A video frame rate is shown. 50Hz, 59.94Hz, 60Hz.
2A Link A	Input 2 Ch A link identifier	The input 2 channel A link identifier is shown. Link A, Link B.
2B VPID	Input 2 Ch B VPID Status	The input 2 channel B video payload identifier is shown. VPID, No VPID.

	Input 2 Ch B link format	The input 2 channel B link format is shown. <i>Dual, Not Dual.</i>
	Input 2 Ch B frame rate	The input 2 channel B video frame rate is shown. <i>50Hz, 59.94Hz, 60Hz.</i>
	Input 2 Ch B link identifier	The input 2 channel B link identifier is shown. <i>Link A, Link B.</i>
	Software version	The version number of the currently installed software.
	Electronically store serial number	The electronically stored PCB serial number. This should correspond with the serial number label affixed to the PCB connector.

Notes: If the input is missing or invalid the frame rate and link identifier menus will be invisible.

Output level menu

From the Status top menu rotate the SCROLL/ADJ control to show the Output Level menu. Press ENTER to access the Output Level menu. Rotating the SCROLL/ADJ control will display the available Output Level menus.

	Menu	Comment
	Output 1 Level	The output 1 level is shown. <i>Level A, Level B.</i>
	Output 2 Level	The output 2 level is shown. <i>Level A, Level B.</i>

Notes: The Dual DL-3G is designed mainly for use with Level B 3Gb/s signals. Although it will work with Level A signals which do not contain audio or other embedded data.

4 Using the front control panel

4.1 Module selection

This operational guide assumes that the panel has been set up 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 all eight control panel keys LEDs will illuminate briefly. Once the panel has completed its power up and configuration sequence the panel will enter Statesman mode and the message 'Press Cal to Exit' will be displayed.



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 a Dual DL-3G

To select a particular card in a frame, press the DEVICE key to go to the Device menu.

Note: There may be a delay whilst the frame is interrogated during which time the 'No cards Found' could be displayed.

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 a Dual DL-3G has been selected.



The Dual DL-3G 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 changes occur through the use of card edge controls or other remote control, the text displayed on the active front panel will not be updated immediately. If necessary, use the * button to update the display.

4.2 The Dual DL-3G active panel menu structure

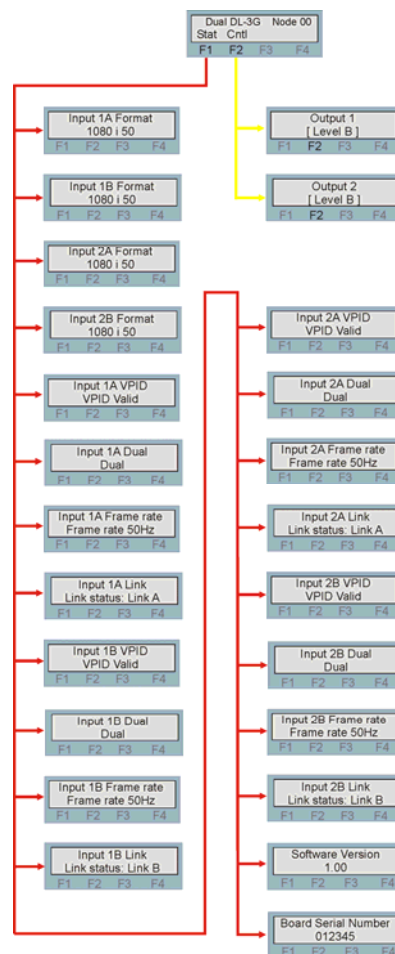
At any time the main top-level menu (Home) is obtained by pressing the HOME key. From the Home menu further selections can be made. Active function keys are indicated by illuminated, integrated LEDs.

The top-level menu Status can be obtained by pressing the F1 key from the Home menu. Menu keys are illuminated when active and when further menus are available.

- When a sub menu has been selected, further options may be obtained by using the Shaft control to scroll through them. Once the desired option has been located a selection or value change can be made by either toggling the appropriate function key or by selecting and using the shaft control to alter a numerical value. A configuration change or value will be activated as the shaft control is rotated or function button is toggled. The variable being adjusted will appear in brackets. If the variable updates in real time it will be contained within square brackets [Field].

The following chart shows the available Dual DL-3G menus. The actual menus available may vary slightly as software is updated.

Active control panel menus



Note: Function key LEDs are illuminated when active.

The Status menu

Pressing button F1 from the Home menu will enter the Status menu. This menu is traversed by rotating the shaft control. No changes can be made from this menu as it is read only.


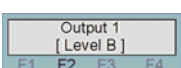
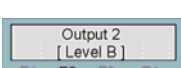
Note: Not all status information will be updated in real time. If necessary press the * button to update the display information.

Menu	Comment
	
	Input 1A video format <i>1080p 50/59.94/60, Invalid, Missing.</i>
	Input 1B video format <i>1080p 50/59.94/60, Invalid, Missing.</i>
	Input 2A video format <i>1080p 50/59.94/60, Invalid, Missing.</i>
	Input 2B video format <i>1080p 50/59.94/60, Invalid, Missing.</i>
	Input 1 Ch A VPID Status <i>VPID, No Valid VPID.</i>
	Input 1 Ch A link format <i>Dual, Not Dual, No Valid VPID.</i>
	Input 1 Ch A frame rate <i>50Hz, 59.94Hz, 60Hz, No Valid VPID.</i>
	Input 1 Ch A link identifier <i>Link A, Link B, No Valid VPID.</i>
	Input 1 Ch B VPID Status <i>VPID, No Valid VPID.</i>
	Input 1 Ch B link format <i>Dual, Not Dual, No Valid VPID.</i>
	Input 1 Ch B frame rate <i>50Hz, 59.94Hz, 60Hz, No Valid VPID.</i>
	Input 1 Ch B link identifier <i>Link A, Link B, No Valid VPID.</i>

	Input 2 Ch A VPID Status	Rotate the shaft control to view the input 2 channel A video payload identifier status. VPID, No Valid VPID.
	Input 2 Ch A link format	Rotate the shaft control to view the input 2 channel A link format. Dual, Not Dual, No Valid VPID.
	Input 2 Ch A frame rate	Rotate the shaft control to view the input 2 channel A frame rate. 50Hz, 59.94Hz, 60Hz, No Valid VPID.
	Input 2 Ch A link identifier	Rotate the shaft control to view the input 2 channel A link status. Link A, Link B, No Valid VPID.
	Input 2 Ch B VPID Status	Rotate the shaft control to view the input 2 channel B video payload identifier status. VPID, No Valid VPID.
	Input 2 Ch B link format	Rotate the shaft control to view the input 2 channel B link format. Dual, Not Dual, No Valid VPID.
	Input 2 Ch B frame rate	Rotate the shaft control to view the input 2 channel B frame rate. 50Hz, 59.94Hz, 60Hz, No Valid VPID.
	Input 2 Ch B link identifier	Rotate the shaft control to view the input 2 channel B link status. Link A, Link B, No Valid VPID.
	Software version installed	Rotate the shaft control to view the version number of the currently installed software.
	Electronically stored serial number	Rotate the shaft control to view the electronically stored PCB serial number. This should correspond with the serial number label affixed to the PCB connector.

Output level menu

From the Status top menu rotate the SCROLL/ADJ control to show the control menu. Press ENTER to access this menu. Rotating the SCROLL/ADJ control will display the available menus.

	Menu	Comment
	Output 1 level format	Rotate the shaft control to view the Output 1 level selection. Press F2 to select menu. Rotate shaft control to change selection. Level A, Level B.
	Output 2 level format	Rotate the shaft control to view the Output 2 level selection. Press F2 to select menu. Rotate shaft control to change selection. Level A, Level B.

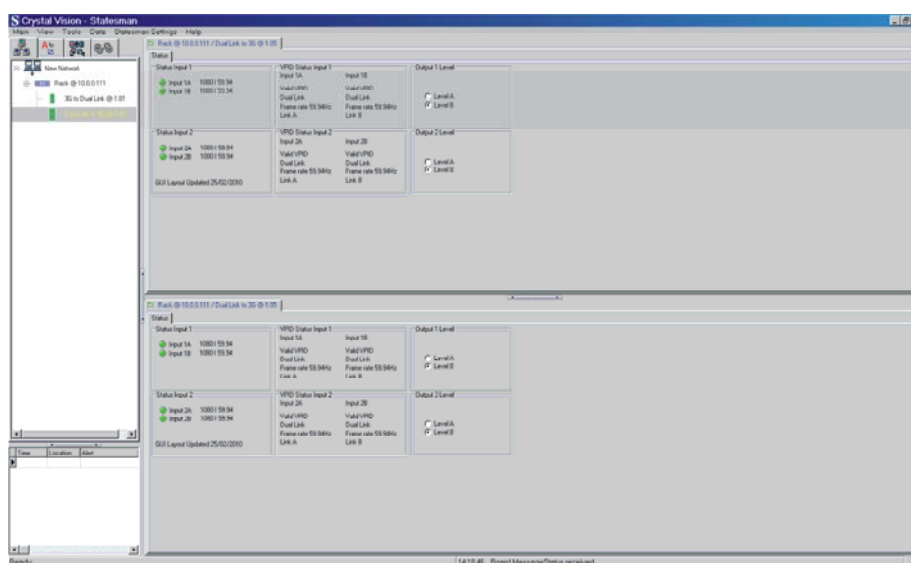
5 Statesman

The Crystal Vision Statesman PC control software is designed to control a range of Crystal Vision modules via serial control from a PC. Statesman provides a user friendly means of configuring and operating Crystal Vision modules with the benefit of “see-at-a-glance” status monitoring.

The main Statesman application communicates with each module in a frame through an active control panel. Therefore an active panel must be fitted to allow for Statesman control.

5.1 Statesman operation

The initial screen will show an Explorer style view of the connected frames and modules. Double-clicking on a module will enable the display of the main application menus.



The Statesman main application window

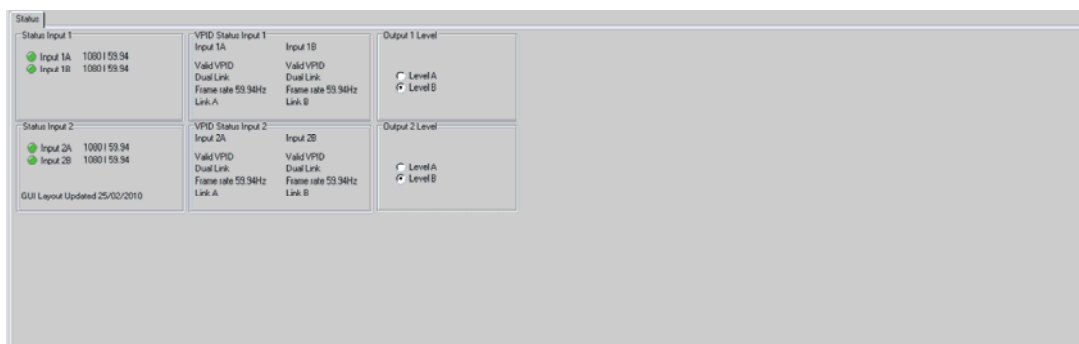
The menu display is repeated for convenience to allow dual-control display of modules with duplicate signal paths or to allow two functions to be viewed at the same time.

The Dual DL-3G Statesman menu tab provides status information for both inputs.

Status

The status pane is divided into six sections, three for each input giving information about input present, input format, VPID status and video output level.

Further status information is provided by the Statesman logging and alarms feature, which is described in more detail in the Statesman manual.



Dual DL-3G Status menu

6 Trouble shooting

The card edge may be used to perform simple trouble shooting. The Statesman PC control system can be used for more comprehensive trouble shooting.



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
	Yellow	Not currently supported	
IP 1A	Yellow	Input 1A present	Input not present
IP 1B	Yellow	Input 1B present	Input not present
IP 2A	Yellow	Input 2A present	Input not present
IP 2B	Yellow	Input 2B present	Input not present
Ch1A	Yellow	Channel 1 is Level A	
Ch1B	Yellow	Channel 1 is Level B	
Ch2A	Yellow	Channel 2 is Level A	
Ch2B	Yellow	Channel 2 is Level B	

Basic fault finding guide

The Power LEDs are not illuminated

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

There is no video output

Check that a valid SDI is present and that any cabling is intact

The video output exhibits jitter

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

The card no longer responds to card edge or remote controller

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 it from the rack whilst powered and re-inserting it after a few seconds. It is safe to re-insert the card whilst the rack is powered

Check that the remote/local lever is correctly set for the mode of operation

7 Specification

General

Dimensions	100mm x 266mm module with DIN 41612 connector
Weight	155g
Power consumption	11 W

Inputs

Video	Two inputs of either 1080p on dual 1.5Gb/s links or two co-timed HD streams serial digital compliant to SMPTE-292M Cable equalisation, 1.5Gb/s – up to 140m, Belden 1694 or equivalent
Video formats supported	1080p 50, 1080p59.94, 1080p60 or two co-timed 1080i50, 1080i59.94 video streams.
Input timing	Input video must be co-timed to within 12 samples

Outputs

Number and type:	One reclocked 3Gb/s output per channel on a single link using a RM50 frame rear module
Video formats supported	1080p50, 1080p59.94, 1080p60 or two co-timed 1080i50, 1080i59.94 video streams combined into SMPTE 425 Level B signals Output follows the input format
Jitter	Meets the above SMPTE Specs.
Delay through board	700 input pixels (level B). One video line plus 700 input pixels (Level A)
Ancillary data	Will pass embedded audio and other ancillary data (Level B only)
Status and monitoring	Card edge visual monitoring, with 10 digit dot matrix display and LED indicators to indicate: PSU rails present, input links present and output level Control from frame active front panel and remote panel Statesman allows control and status monitoring from any PC on a network SNMP monitoring and control available as a frame option