Dual 3G-DL

Dual channel single link
to dual link converter

USER MANUAL

**Crystal Vision**

Contents

1   Introduction

The Dual 3G-DL is a 3G to dual link converter for interfacing between 3Gb/s and 1080p dual link equipment. It takes a single 3Gb/s signal and separates it into two 1.5Gb/s signals which can either be a dual link 3Gb/s signal, or alternatively two separate, co-timed HD signals

The two co-timed HD signals could be the left and right pictures from an HD 3D programme. Two different HD signals could be passed on a single 3Gb/s line with the Dual 3G-DL then used to separate them for video processing such as editing

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

The Dual 3G-DL 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 3G-DL automatically detects level A or B and adjusts accordingly.
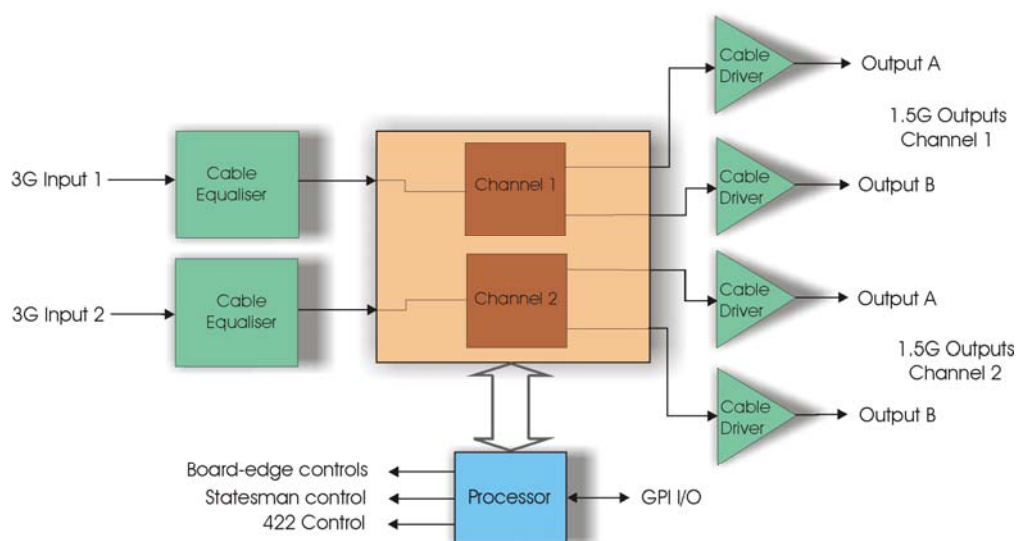
The Dual 3G-DL card can be controlled by Statesman PC control software, active control panel such as the REMIND-E, or from its card edge controls.

The main features of Dual 3G-DL are:

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

2 Hardware installation

The Dual 3G-DL single height module is used with the RM53 rear connectors, 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
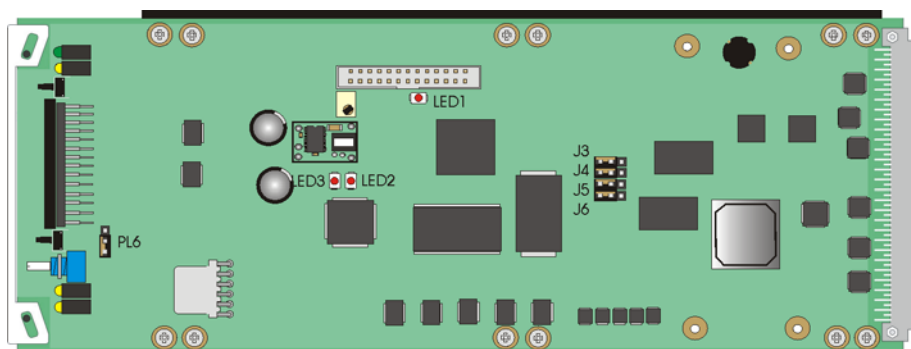
Dual 3G-DL

Link configuration and LEDs

There are 5 jumper links and three surface-mounted LEDs on the Dual 3G-DL. 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 has 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 3G-DL is the RM53.

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

Rear module connections with RM53

RM53 fits in all frames	Description
	RM53 • 24 Dual 3G-DL 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

RM53 BNC	I/O assignment
3G IN 1	Channel 1 3G Serial Digital input
3G IN 2	Channel 2 3G Serial Digital input
SDI OUT 2A	Channel 2 1.5G reclocked SDI output
SDI OUT 2B	Channel 2 1.5G reclocked SDI output
SDI OUT 1A	Channel 1 1.5G reclocked SDI output
SDI OUT 1B	Channel 1 1.5G reclocked SDI output

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 3G-DL 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 1	Yellow	Input 1 present	Input not present
IP 2	Yellow	Input 2 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
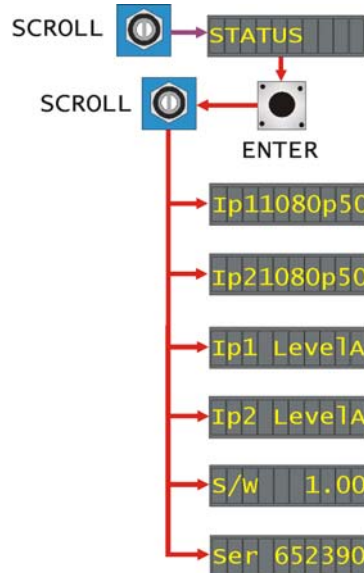
Tip: To reach the top menu push the ⟳ button repeatedly until a top menu is reached. Rotate the SCROLL control anti-clockwise until the Status menu appears.

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
Ip11080i50	Input 1 video format	The input 1 video format is shown. *1080p 50/59.94/60, Invalid, Missing.*
Ip21080i50	Input 2 video format	The input 2 video format is shown. *1080p 50/59.94/60, Invalid, Missing.*
Ip1 LevelA	Input 1 video level	The input 1 video level is shown. *Level A, Level B.*
Ip2 LevelA	Input 2 video level	The input 2 video level is shown. *Level A, Level B.*
S/W 1.00	Software version installed	The version number of the currently installed software.
ser 123456	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 any input is missing all status displays related to that input will show 'input missing'.

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.
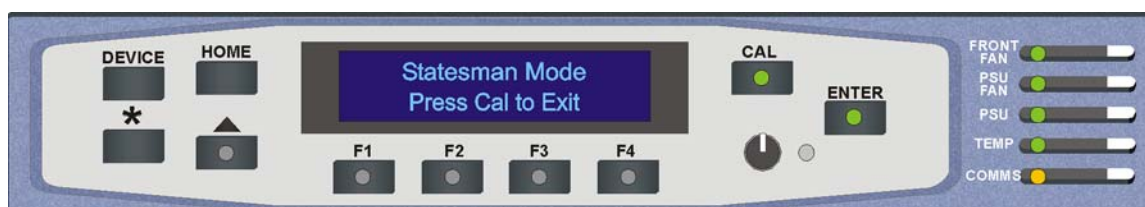
Statesman mode is entered by default

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 3G-DL

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 3G-DL has been selected.
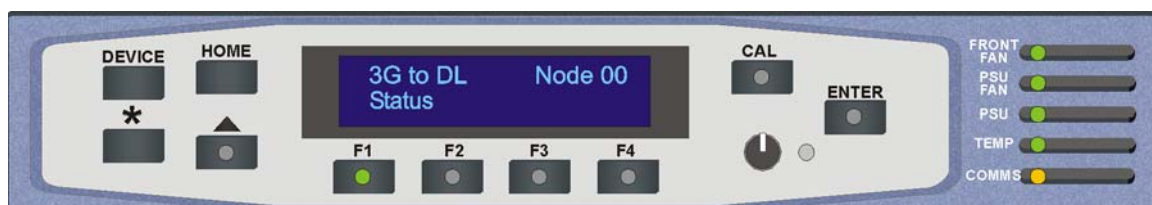
The Dual 3G-DL Home menu

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 upward arrow to leave and then re-enter a menu to update the display.

4.2 The Dual 3G-DL active panel menu structure

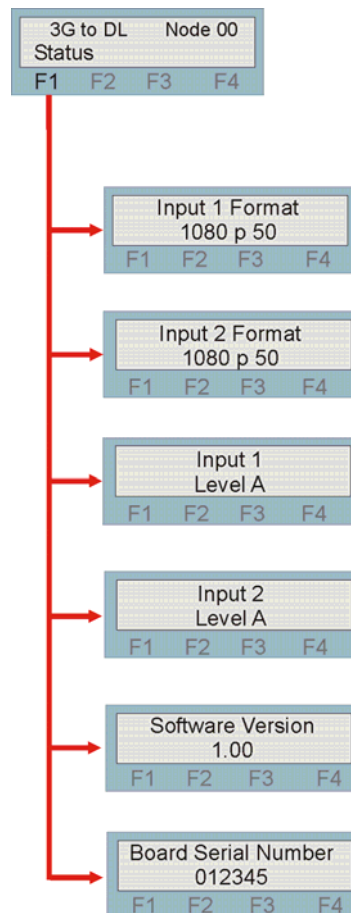At any time the main top-level menu (Home) is obtained by pressing the HOME key. From the Home menu further selections can be made. Active function keys are indicated by illuminated, integrated LEDs.

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 3G-DL menus. The actual menus available may vary slightly as software is updated.
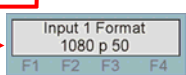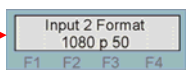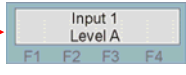
Active control panel menus

```
          ┌─────────────────────────┐
          │ 3G to DL      Node 00   │
          │ Status                  │
          │ F1    F2    F3    F4     │
          └─────────────────────────┘
            │
            │        ┌─────────────────────────┐
            ├───────▶│     Input 1 Format      │
            │        │        1080 p 50        │
            │        │  F1    F2    F3    F4    │
            │        └─────────────────────────┘
            │
            │        ┌─────────────────────────┐
            ├───────▶│     Input 2 Format      │
            │        │        1080 p 50        │
            │        │  F1    F2    F3    F4    │
            │        └─────────────────────────┘
            │
            │        ┌─────────────────────────┐
            ├───────▶│        Input 1          │
            │        │        Level A          │
            │        │  F1    F2    F3    F4    │
            │        └─────────────────────────┘
            │
            │        ┌─────────────────────────┐
            ├───────▶│        Input 2          │
            │        │        Level A          │
            │        │  F1    F2    F3    F4    │
            │        └─────────────────────────┘
            │
            │        ┌─────────────────────────┐
            ├───────▶│     Software Version    │
            │        │         1.00            │
            │        │  F1    F2    F3    F4    │
            │        └─────────────────────────┘
            │
            │        ┌─────────────────────────┐
            └───────▶│   Board Serial Number   │
                     │        012345           │
                     │  F1    F2    F3    F4    │
                     └─────────────────────────┘
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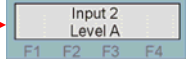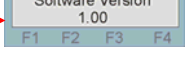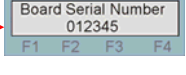
Note: Function key LEDs are illuminated when active.

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
3G to DL Node 00 Status F1 F2 F3 F4		
Input 1 Format 1080 p 50 F1 F2 F3 F4	Input 1 video format	Pressing F1 from the status menu will show the input 1 video format. *1080p 50/59.94/60, Invalid, Missing.*
Input 2 Format 1080 p 50 F1 F2 F3 F4	Input 2 video format	Rotate the shaft control to view the input 2 video format. *1080p 50/59.94/60, Invalid, Missing..*
Input 1 Level A F1 F2 F3 F4	Input 1 video level	Rotate the shaft control to view the input 1 video level. *Level A, Level B.*
Input 2 Level A F1 F2 F3 F4	Input 2 video level	Rotate the shaft control to view the input 2 video level. *Level A, Level B.*
Software Version 1.00 F1 F2 F3 F4	Software version installed	Rotate the shaft control to view the version number of the currently installed software.
Board Serial Number 012345 F1 F2 F3 F4	Electronically store 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.

Notes: If any input is missing all status displays related to that input will show 'input missing'.
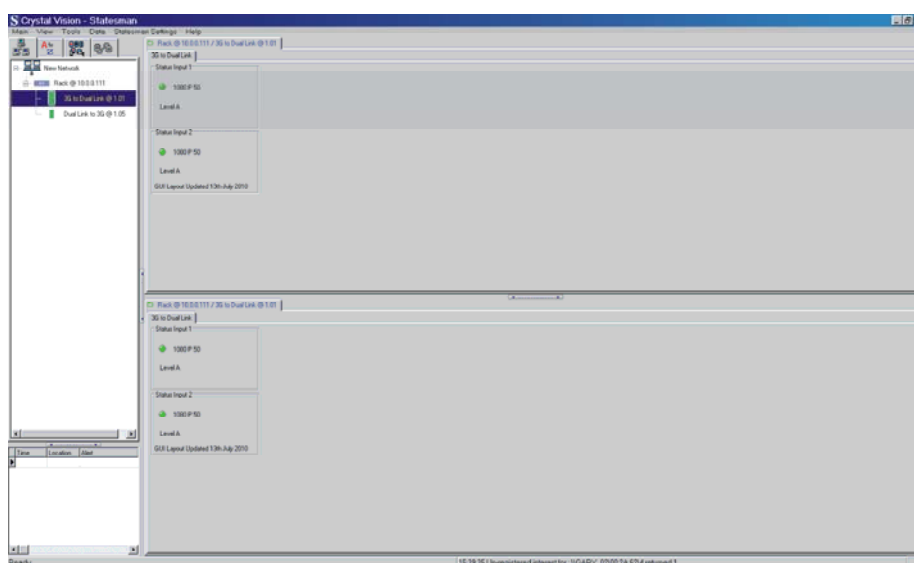
5 Statesman

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

Status

The status pane is divided into two sections, one for each input giving information about input present, input format and video level.

Further status information is provided by the Statesman logging and alarms feature, which is described in more detail in the Statesman manual.
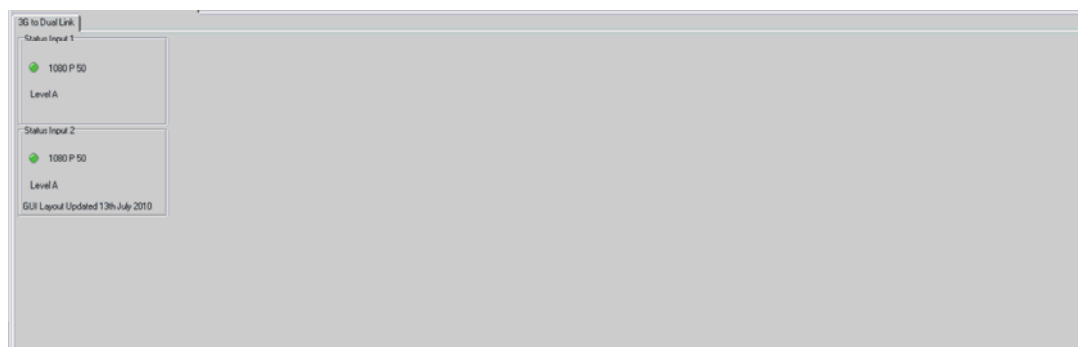
Dual 3G-DL Status menu

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
IP 1	Yellow	Input 1 present	Input not present
IP 2	Yellow	Input 2 present	Input not present
PSU	Green	Good power supply (PSU) rails	One or more of the monitor supplies is out of specification
	Yellow	Not currently supported	
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	2.970Gb/s (3G) serial digital compliant to SMPTE 424M
	Cable equalisation:
	3Gb/s (2.970Gb/s) – 80 meters, Belden 1694 or equivalent
Video standards supported	1080p50, 1080p59.94, 1080p60 or two co-timed 1080i50, 1080i59.94 or 1080i60 video streams combined into an SMPTE 425 Level B signal.

Outputs

Number and type:	One pair of reclocked outputs per channel of either 1080p on dual 1.5Gb/s links or two co-timed HD signals using RM53 frame rear module. Output follows the input format
Jitter	Meets the above SMPTE Specs.
Status and monitoring	Card edge visual monitoring, with 10 digit dot matrix display and LED indicators to indicate:
	PSU rails present, inputs present and output routing
	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