ViViD 3G

3G/HD/SD variable video delays

Crystal Vision

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Contents

Revision 1	Added VisionWeb info, moved Statesman info to Appendix 1.	19/08/14
Revision 2	Corrected YUV gain adjusment figures on page 28.	19/05/16
Revision 3	Clarified GPI section.	27/06/16
Revision 4	Added note about removal of card edge control in 2019.	19/01/21

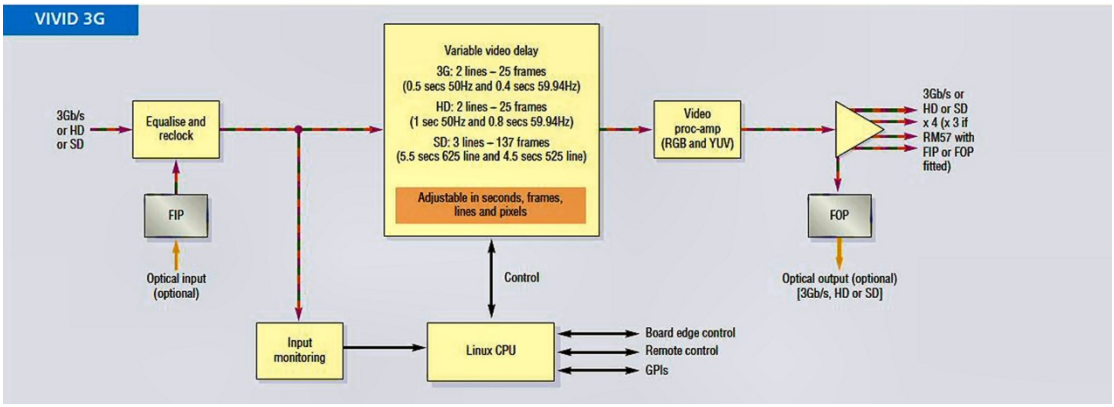
1 Introduction

ViViD 3G is a range of four 3Gb/s-compatible variable video delays. The maximum delays available are ten seconds for 3Gb/s, 20 seconds for HD and 110 seconds for SD. Delays are adjustable in seconds,frames, lines and pixels for precise matching of system delays. ViViD versions 3GS and 3GS-20 include – in addition to the delay line – a frame synchroniser to lock the output video to station reference.

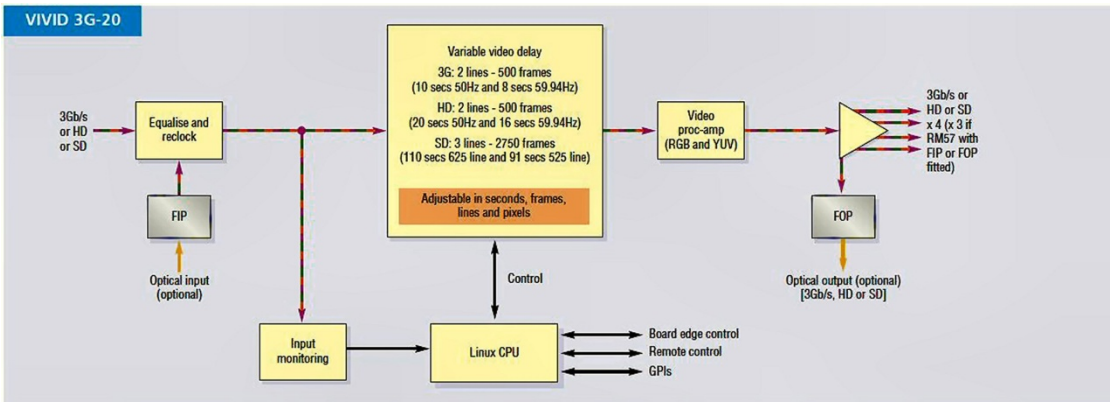
The main features are as follows:

- **Use with any source** – works with 3Gb/s, HD and SD
- **Supports the following video standards:** 625, 525, 720p50, 720p59.94, 1080i50, 1080i59.94, 1080p50, 1080p59.94, 1080psf23.98, 1080psf24.
- **Optimise the video:** video proc-amp allows adjustment of video gain, black level and independent YUV gains. ViViD 3GS and 3GS-20 also feature a full-frame synchroniser that re-times the video to match an external reference.
- **Multiple video outputs** – Four delayed outputs save the need for an additional DA.
- **Control** of ViViD 3G is most easily achieved with VisionWeb PC software but also by an active front panel on the frame, a remote panel and SNMP. Board edge control was also available prior to 2019.
- **Optical connectivity** – send signal beyond the local equipment bay with the fibre input and output options.
- **GPI control** – 16 presets allow different delay values to be assigned then recalled automatically by GPI.
- **HANC and VANC** blanking option.
- **EDH** insertion.
- **Supports rear module connectors:** RM41, RM57, RM67.
- **Compatible** with Crystal Vision standard frames available in 2U, 1U and desk top box.
- **Passes** all timecode, AFD, subtitling information, Dolby E metadata and embedded audio.
- **Freeze output** – Force output to freeze or produce black, blue or bars manually, or automatically if input video lost.
- **GPI Output Alarms** – Two output alarms if input video is missing, black or frozen, or (ViViD 3GS/3GS-20 only) reference is missing.

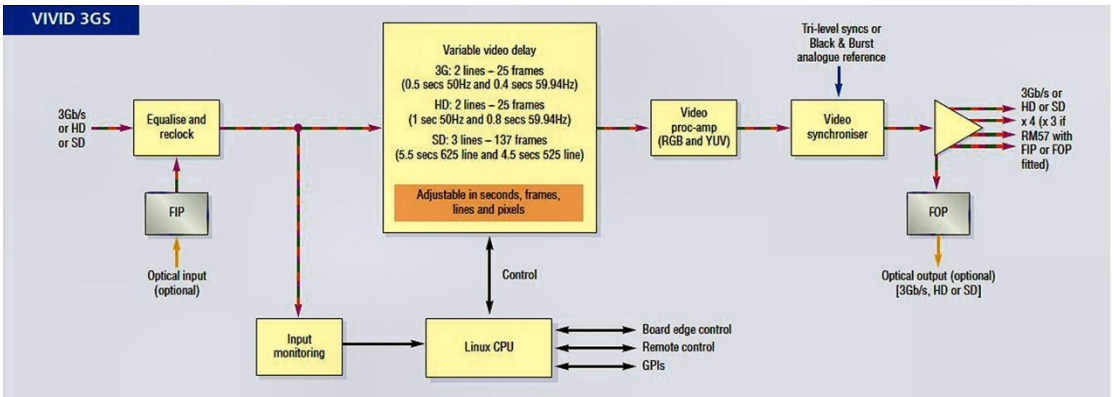
Block Diagrams



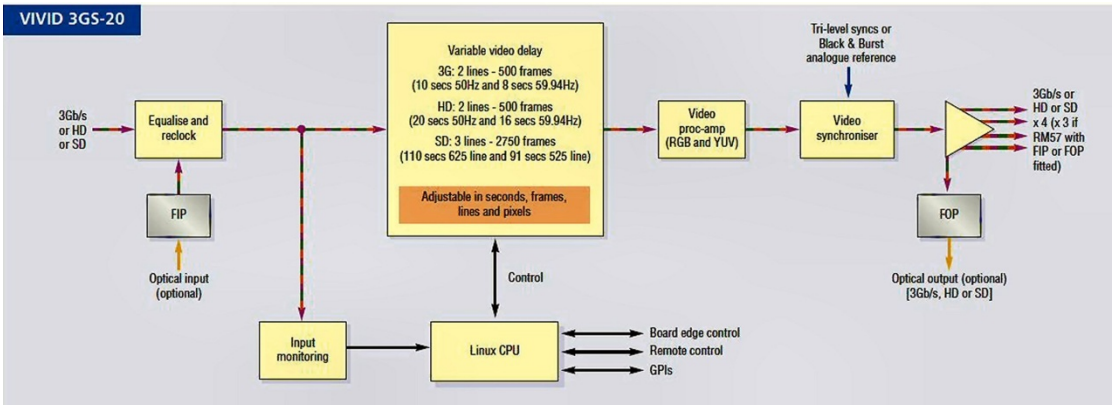
ViViD 3G Functional Block Diagram



ViViD 3G-20 Functional Block Diagram



ViViD 3GS Functional Block Diagram



ViViD 3GS-20 Functional Block Diagram

ViViD 3G Block Diagram Description

All versions of ViViD 3G are similar with the exception that 'S' models include a frame synchroniser and '-20' models have 20 times more delay.

Input video from either the BNC input or the (optional) optical input is equalised and then re-clocked. The video signal then passes through a delay line whose length is adjustable in seconds, frames, line and pixel increments under control of the CPU. Following the delay line is the proc-amp where lift and gain can be applied to the video components in the YUV or RGB domain. For the 'S' models the video signal then passes through a frame synchroniser to lock the output to an external analogue Black and Burst or tri-level syncs reference. Finally, depending on the rear module fitted, the video is output to the rear modules as either four BNC or three BNC and one optical output.

Video delays in ViViD 3G

Model	Video Format		
	3Gb/s	HD	SD
3G	2 lines to 25 frames	2 lines to 25 frames	3 lines to 137 frames
3GS	2 lines to 25 frames	2 lines to 25 frames	3 lines to 137 frames

3G-20	2 lines to 500 frames	2 lines to 500 frames	3 lines to 2750 frames
3GS-20	2 lines to 500 frames	2 lines to 500 frames	3 lines to 2750 frames

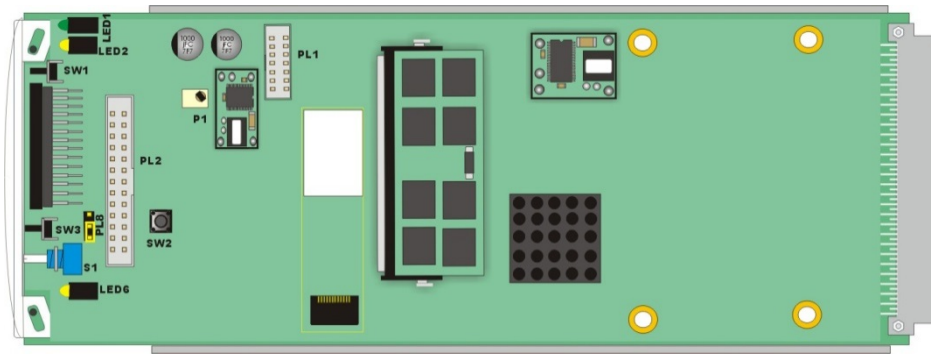
Delay range in lines and frames for all models of ViViD 3G

Model	Video Format		
	3Gb/s	HD	SD
3G	0.5 secs @ 50Hz 0.4 secs @ 59.94Hz	1 sec @ 50Hz 0.8 secs @ 59.94Hz	5.5 secs @ 625 line 4.5 secs @ 525 line
3GS	0.5 secs @ 50Hz 0.4 secs @ 59.94Hz	1 sec @ 50Hz 0.8 secs @ 59.94Hz	5.5 secs @ 625 line 4.5 secs @ 525 line
3G-20	10 secs @ 50Hz 8 secs @ 59.94Hz	20 secs @ 50Hz 16 secs @ 59.94Hz	110 secs @ 625 line 91 secs @ 525 line
3GS-20	10 secs @ 50Hz 8 secs @ 59.94Hz	20 secs @ 50Hz 16 secs @ 59.94Hz	110 secs @ 625 line 91 secs @ 525 line

Maximum delay in seconds for all models of ViViD 3G

2 Hardware installation

Board configuration



ViViD 3G main board top-side

Note: The potentiometer P1 is factory set and should not be adjusted.

Link Configuration

2.1.1.1 There are no user-settable links on the ViViD 3G.

Link	Towards front of board or Up	Towards the rear of board or Down
PL8	Debug mode	Normal mode (factory set, do not alter)

3 Rear modules and signal I/O

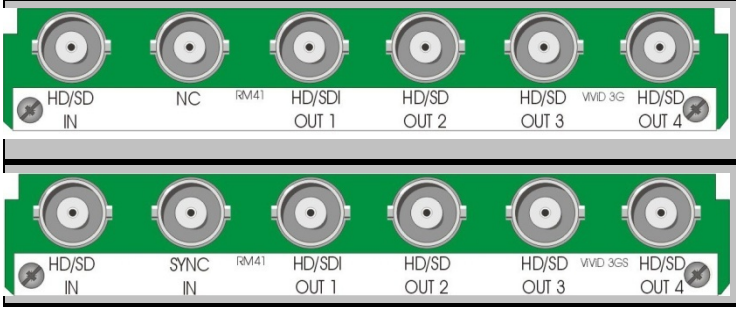
The 2U Indigo 2 frame will house up to 12 single height modules and dual power supplies. The 1U Indigo 1 frame will house six single height modules and a single or dual power supply. The Indigo DT desk top boxes have a built-in power supply and will house up to two single height modules. All modules can be plugged in and removed while the frame is powered without damage.

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

The ViViD 3G range can support the following rear modules: RM41, RM57 and RM67.

Rear module connections with RM41

The RM41 being a single height module will allow maximum packing density with one HD/SD video input and four HD/SD video outputs. The RM41 when used with ViViD 3GS and 3GS-20 (bottom picture) has an additional SYNC input for the synchroniser reference.

RM41 rear module connector	Description
	**RM41** • 12 per Indigo 2 frame • Six per Indigo 1 frame • Two per Indigo DT • All frame slots can be used • ‘S’ models have SYNC input for reference syncs (bottom picture)

BNC Connections

BNC	I/O assignment
HD/SD IN	3G/High Definition/Standard Definition serial digital input.
NC or SYNC IN	Analogue Black and Burst or tri-level syncs for ‘S’ versions only.
HD/SD OUT 1	3G/High Definition/Standard Definition serial digital output.
HD/SD OUT 2	3G/High Definition/Standard Definition serial digital output.
HD/SD OUT 3	3G/High Definition/Standard Definition serial digital output.
HD/SD OUT 4	3G/High Definition/Standard Definition serial digital output.

Rear module connections with RM57

The RM57 being a single height module will allow maximum packing density with one HD/SD video input and three HD/SD video outputs and a single optical I/O connector. The RM57 when used with ViViD 3GS and 3GS-20 versions (bottom picture) has an additional SYNC input for the synchroniser reference.

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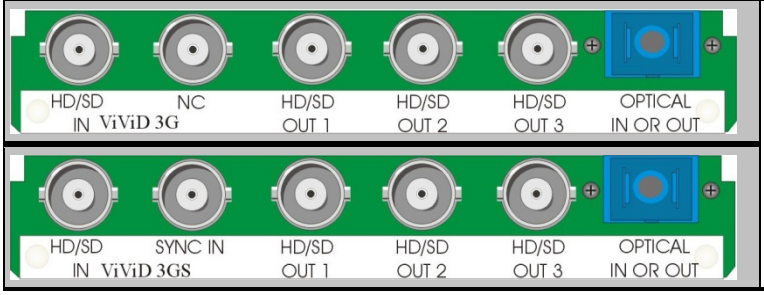
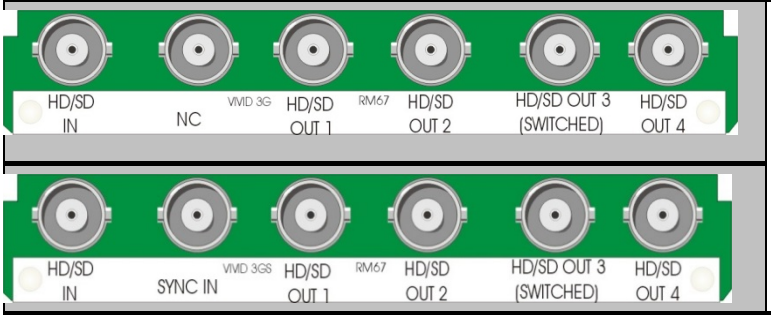
RM57 rear module connector	Description
	**RM57** • 12 per Indigo 2 frame • Six per Indigo 1 frame • Two per Indigo DT • All frame slots can be used • 'S' models have SYNC input for reference syncs (bottom picture)

BNC connections

BNC	I/O assignment
HD/SD IN	3G/High Definition/Standard Definition serial digital input.
NC or SYNC IN	Analogue Black and Burst or tri-level syncs for 'S' versions only.
HD/SD OUT 1	3G/High Definition/Standard Definition serial digital output.
HD/SD OUT 2	3G/High Definition/Standard Definition serial digital output.
HD/SD OUT 3	3G/High Definition/Standard Definition serial digital output.
OPTICAL IN/OUT	3G/High Definition/Standard Definition serial digital optical input/output.

Rear module connections with RM67

The RM67 relay bypass rear module is a single height module that allows maximum packing density with one HD/SD video input and four HD/SD video outputs. The RM67 when used with ViViD 3GS and 3GS-20 has an additional SYNC input for the synchroniser reference. In the event of power failure, the video input is automatically connected to HD/SD OUT 3 (SWITCHED).

RM67 rear module connector	Description
	**RM67** • 12 per Indigo 2 frame • Six per Indigo 1 frame • Two per Indigo DT • All frame slots can be used • 'S' models have SYNC input for reference syncs (bottom picture)

BNC Connections

BNC	I/O assignment
HD/SD IN	3G/High Definition/Standard Definition serial digital input.
NC or SYNC IN	Analogue Black and Burst or tri-level syncs for 'S' versions only.
HD/SD OUT 1	3G/High Definition/Standard Definition serial digital output.
HD/SD OUT 2	3G/High Definition/Standard Definition serial digital output.
HD/SD OUT 3 (SWITCHED)	3G/High Definition/Standard Definition serial digital output. HD/SD IN is automatically connected to this output in the event of power failure.
HD/SD OUT 4	3G/High Definition/Standard Definition serial digital output.

4 General Purpose Interface

Introduction

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.

ViViD 3G has four GPI inputs and two GPI outputs.

Each General Purpose Interface (GPI) input is fitted with a 6800Ω resistor connected to the internal +5V and in the following table, this equates to logic ‘H’. With the GPI preset recall lines set to ‘level’ mode and no connections (logic ‘HHHH’), preset 1 will be selected. With the GPI preset recall lines set to ‘pulse’ mode, the GPI will be activated whenever a bit is pulled low but no change to the preset selection will occur when all bits return to logic ‘HHHH’. Note that preset 16 is not accessible in pulse mode.

***Note**: Because the GPI inputs are sampled in the vertical interval it is recommended that in ‘pulse’ mode, the GPI should be asserted at least 2mS before the start of vertical sync to ensure stability and held active for at least 40mS.*

See *Presets* in this manual for details of inverting the GPI preset logic.

Each General Purpose Interface (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.

The GPI inputs can be programmed to automatically recall a previously saved preset configuration. The 16 user preset configurations are selected using binary notation.The two outputs can be programmed to assert themselves for a number of different alarm conditions.

GPI			Low (<1V)	High (+5V)
1	**‘a’**	**Recall preset bit 1**	See following table for user preset control	
2	**‘b’**	**Recall preset bit 2**		
3	**‘c’**	**Recall preset bit 4**		
4	**‘d’**	**Recall preset bit 8**		
5	**‘e’**	**Alarms** (See alarm table)	Alarm condition	No alarm
6	**‘f’**	**Alarms (**See alarm table)	Alarm condition	No alarm

Table showing the six GPI functions

GPI	Bit 8	Bit 4	Bit 2	Bit 1
Preset				
1	H	H	H	H
2	H	H	H	L
3	H	H	L	H
4	H	H	L	L
5	H	L	H	H
6	H	L	H	L

7	H	L	L	H
8	H	L	L	L
9	L	H	H	H
10	L	H	H	L
11	L	H	L	H
12	L	H	L	L
13	L	L	H	H
14	L	L	H	L
15	L	L	L	H
16	L	L	L	L

Binary coding of GPI inputs to recall preset configurations in level mode

GPI	Bit 8	Bit 4	Bit 2	Bit 1
Preset				
No change				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16	Not accessible in pulse mode.			

Binary coding of GPI inputs to recall preset configurations in pulse mode

Alarms

GPI outputs 5 and 6 (e, f) can be configured to be asserted (logic 'L') for a selection of error conditions.

For each GPO there are four separate alarm conditions and all of the alarm conditions can be assigned to both. See Section *Control Descriptions* for more details of alarms.

Reportable error conditions	No. of alarms
Input Video Missing	1
Input Video Black	1
Input Video Frozen	1
Reference Input Misssing ('S' versions only)	1

Alarm Table

2U frame GPI connections

GPI lines ‘a’ to ‘f’ of each card connect to two 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 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 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)

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.*

5 Control and Status Monitoring

ViViD 3G controls and status can be accessed most easily by Crystal Vision's 'VisionWeb' PC software but also by card edge control and the rack front panel.

Board edge control was removed from ViViD 3G in 2019. Therefore the card edge control information detailed here is only relevant for older versions of the product.

Card edge controls

ViViD 3G board edge

Card edge buttons

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

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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.

Card edge rotary control

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

Control	Function
SCROLL/ ADJ	Rotate SCROLL/ADJ 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.*

Reading card edge LEDs

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

Refer also to the troubleshooting 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
Ref	Yellow	Reference input present ('S' versions only)	No valid reference present
IP1HD	Yellow	Video input standard is HD (High Definition)	Input not present
IP1SD	Yellow	Video input standard is SD (Standard Definition)	
GPO5	Yellow	GPO 5 active / low	GPO 5 inactive / high
GPO6	Yellow	GPO 6 active / low	GPO 6 inactive / high

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/ADJ control until the desired menu category is found
- Press ENTER to enter the sub-menus of that category
- Rotate SCROLL/ADJ to select a sub-menu
- Press 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 changes to ***italics*** to indicate that a change has been made and requires confirmation
- When required push ENTER to action the change. The display will return to normal non-italic text
- Use the up-arrow [^] and SCROLL/ADJ control to navigate to further menus

Using the front control panel

At power up, the LEDs of all eight control panel keys will illuminate briefly. Once the panel has completed its power up and configuration sequence, the panel will enter its status mode and display the current software version and frame IP address.

'Status' menu showing current software version and IP address

Selecting a ViViD 3G

To continue with control panel operation or configuration, press the 'DEVICE' key once. 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. Rotate the Shaft control to poll through the available cards.Use the F2 soft key to toggle between the card's serial number and issue number with modification level.

'Device' menu showing ViViD 3G in slot 1.01

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 ViViD 3G home menu

Rotate the shaft control to scroll through the menu structure and press ENTER to select the sub-menus. Press HOME at any time to return to the home menu.

ViViD 3G Video Status sub-menu

Press ENTER to select the Video Status menu or SCROLL to display other sub-menus. See description of menu structure below for list of sub-menus.

Control Panel keys overview

The functions assigned to the control panel keys are:

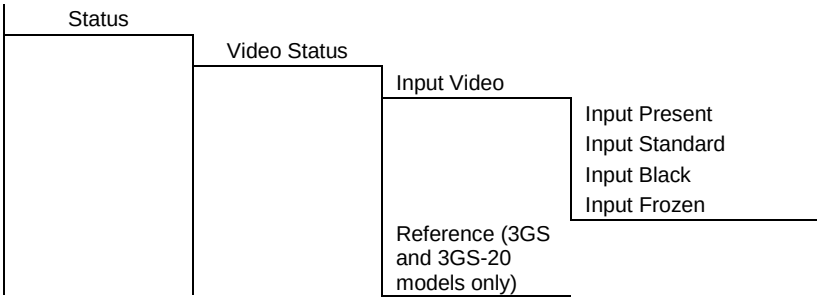
- DEVICE – enters 'device' menu to select a card or show available cards.
- ASTERISK (*) – selects 'network configuration' menu.
- F1 to F4 – soft keys not currently used by ViViD 3G.
- HOME – returns to top of ViViD 3G's menu structure.
- ENTER – accepts current selection.
- Up arrow – used to move up through the menu structure.
- Rotary control – shaft encoder used to select sub-menus or variable data.

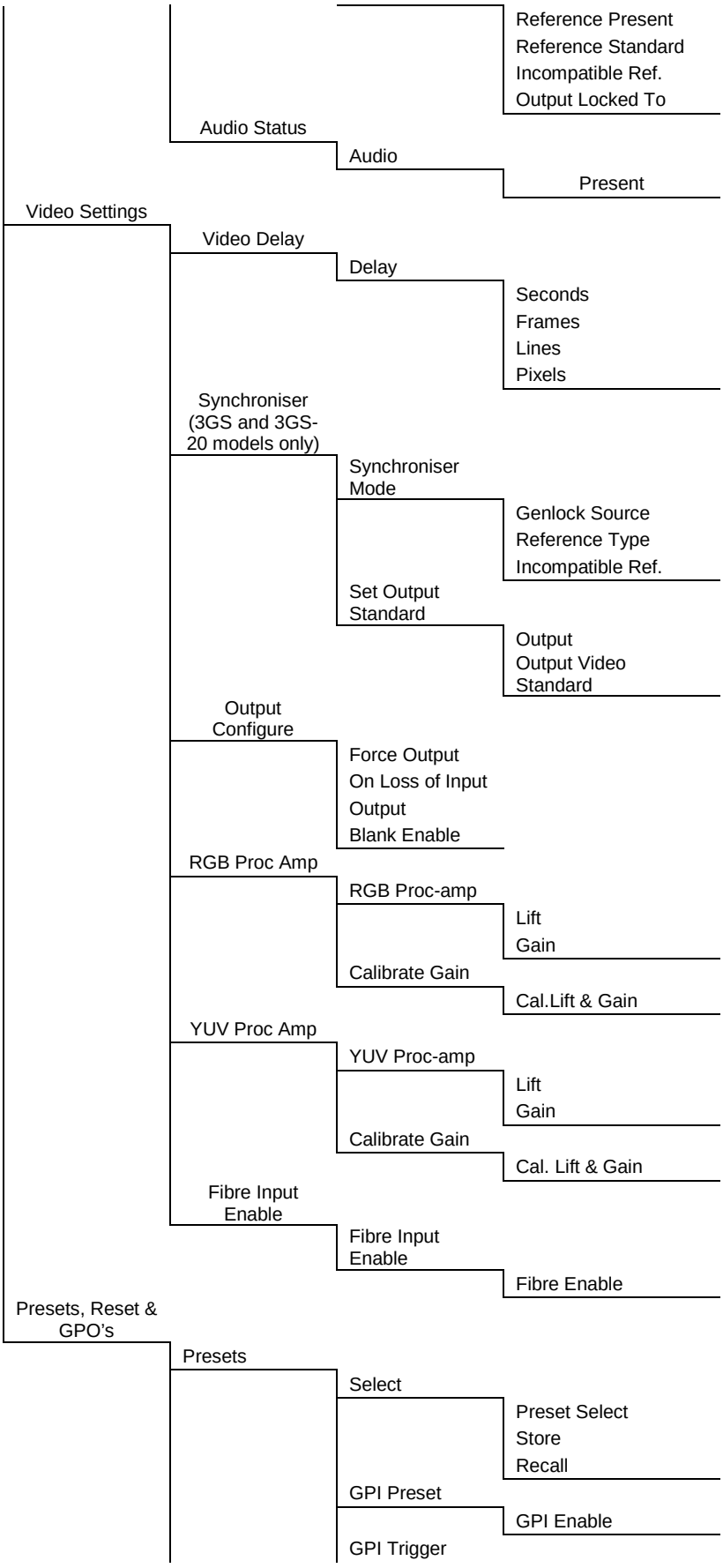
Updating the display

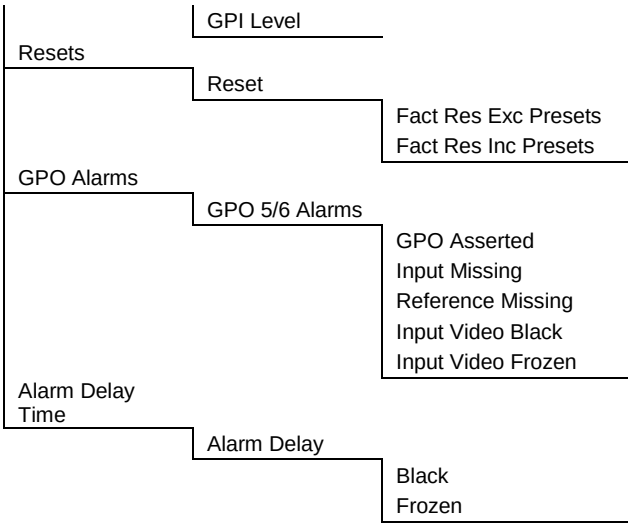
The values displayed on an active front panel are only updated when an adjustment is made and when changing menu level. If changes occur through the use of card edge controls or other remote control, the text displayed on the active front panel will not be updated immediately. If necessary, use the upward arrow to leave and then re-enter a menu to update the display.

Menu Structure

The basic menu structure for card edge, front panel access and VisionWeb is identical and consists of the following menus and sub-menus.




Reference Present
Reference Standard
Incompatible Ref.
Output Locked To
Audio Status
Audio
Present
Video Settings
Video Delay
Delay
Seconds
Frames
Lines
Pixels
Synchroniser (3GS and 3GS-20 models only)
Synchroniser Mode
Genlock Source
Reference Type
Incompatible Ref.
Set Output Standard
Output
Output Video Standard
Output Configure
Force Output On Loss of Input
Output Blank Enable
RGB Proc Amp
RGB Proc-amp
Lift
Gain
Calibrate Gain
Cal.Lift & Gain
YUV Proc Amp
YUV Proc-amp
Lift
Gain
Calibrate Gain
Cal. Lift & Gain
Fibre Input Enable
Fibre Input Enable
Fibre Enable
Presets, Reset & GPO's
Presets
Select
Preset Select
Store
Recall
GPI Preset
GPI Enable
GPI Trigger



The above menu structure is the means to access the various ViViD 3G controls and status. A more detailed description is in the section 'Control Descriptions'.

Controlling cards via VisionWeb

Crystal Vision cards use an XML file to create a control database that is used by the card's front-edge controller, the Indigo frame front panel controller and VisionWeb software. VisionWeb software offers a full range of controls with slider controls etc. similar to that available with the older Statesman PC software.

Accessing the Indigo Home page with a PC browser via the Ethernet connector of an Ethernet-enabled frame will display a list of the cards fitted. (See appropriate frame manual for more details.)

Indigo home page

The example above shows a ViViD 3G card fitted in slot one and the frame's power supply and status monitor in slots 13 and 14. Clicking on the ViViD 3G card will bring up the card's home page:

ViViD 3G Status Page

6 Control Descriptions

The controls of ViViD 3G are accessible from the front panel, the board edge or from Crystal Vision's VisionWeb software. The description of controls used in this manual is based on VisionWeb GUI screen grabs but the path to locate controls via the front panel or board edge follows the same logic. For instance, in the VisionWeb GUI the 'Input Frozen' control is located in the '**Video Status'** group of the '**Status'** menu. To find the same control using the card edge or front panel follow the path **Status->Vid Status** to the **Ip Frozen** control.

VisionWeb GUI controls are accessed by menus at the bottom of the page which, when selected, offer sub-menus containing a number of controls. Some controls are simulated LEDs that are used to show status, others are check boxes, buttons or sliders which change various ViViD 3G settings.

Some controls are model dependent. For instance, no synchroniser controls will be available for 3G and 3G-20 models.

The description of the menus are in the order shown in the GUI i.e.

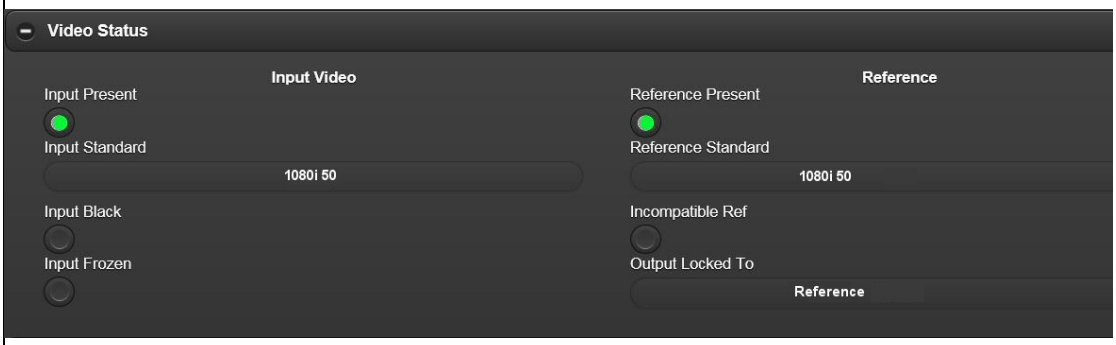
VIDEO STATUS, AUDIO STATUS, VIDEO DELAY, SYNCHRONISER *(3GS and 3GS-20 models only)***, OUTPUT CONFIGURE, RGB PROC AMP, YUV PROC AMP, FIBRE INPUT ENABLE, PRESETS, GPO ALARMS, ALARM DELAY TIME.**

Each tab is shown with a screen grab and description of each control's function:

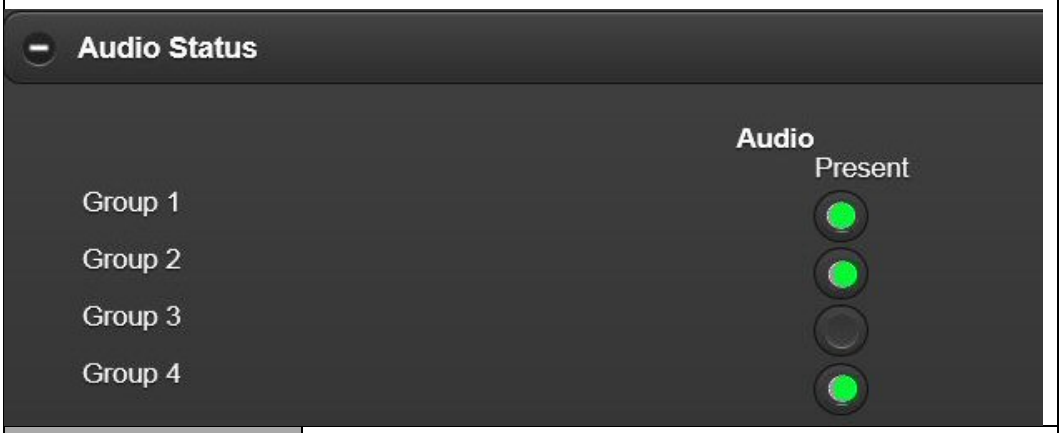
Status Menu

Video Status

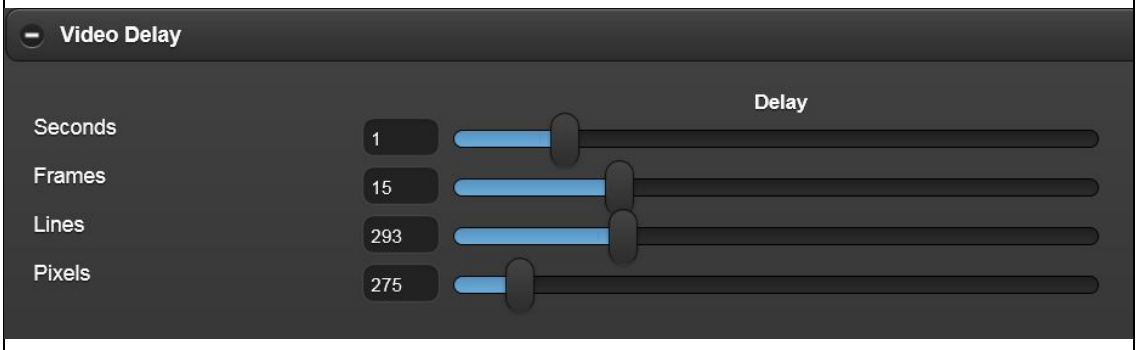
Display presence, standard and status of incoming video signal and for 3GS and 3GS models only, display synchroniser reference standard and status.



Input Present	**On when input video is present.**
Input Standard	**Displays video standard of incoming video. i.e. 1080i 50, 1080p 50, 720p 50, 625, 525 etc.**
Input Black	**On if video input is permanently at black level.**
Input Frozen	**On if video input is a permanent still frame.**
Reference Present	**On if a valid reference is detected (3GS and 3GS-20 models only).**
Reference Standard	**Displays current reference standard (3GS and 3GS-20 models only).**
Incompatible Reference	**On if reference signal is of an incompatible standard to the output standard (3GS and 3GS-20 models only).**
Output Locked To	**Displays synchroniser genlock source. i.e Input, Reference or Freerun if no valid input or reference input (3GS and 3GS-20 models only).**

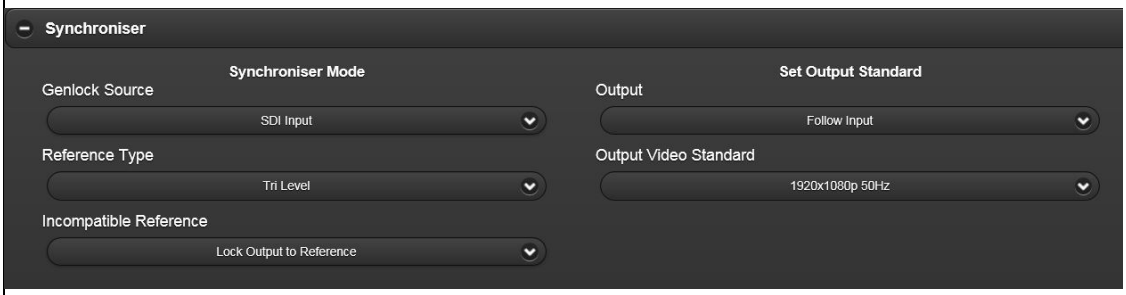
Audio Status	
Displays presence of embedded audio groups.	
	
Group 1 – 4 Present	**On when embedded audio group is present in video.**

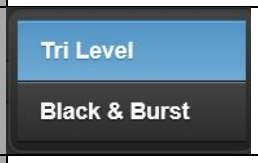
Video Settings Menu

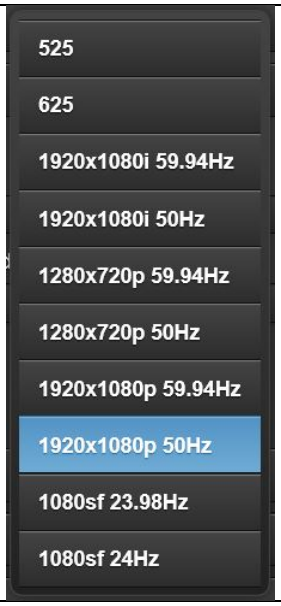
Video Delay	
These controls set the length of the delay period in seconds, frames, lines and pixels. The maximum delay that can be achieved varies from 0.4 seconds to 110 seconds depending on the ViViD 3G model used and the input video standard. VisionWeb recognises the ViViD model fitted and adjusts the maximum delay to five seconds for 3G and 3GS models and 110 seconds for 3G-20 and 3GS-20. The maximum delay that can be set by the controls is auto limited according to the video standard. In the example below the maximum delay is just over five seconds which is the most achievable for the ViViD 3G model with an SD 625 line input.	
	
Seconds, Frames, Lines, Pixels Delay	**Use these controls to set the variable delay from 0 to the maximum possible for the ViViD 3G model used. *Note that the maximum delay value may not be achievable with all input video standards. See 'Video Delays in ViViD 3G' on pages 6-7.***

Synchroniser

These controls (3GS and 3GS-20 models only) set the source and type of reference for the synchroniser and set the video output standard.

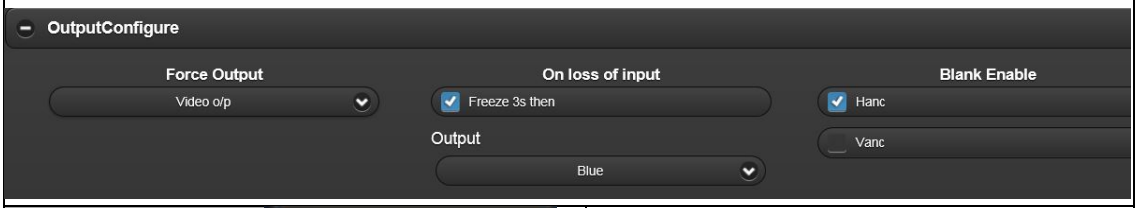


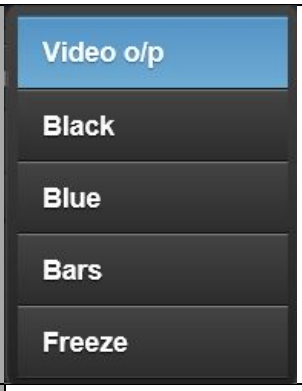
Genlock Source		**Select either the SDI video input or the reference input as the reference source for the synchroniser output. Select 'SDI Input' if the reference signal is missing or of a different standard to the input. Select 'Reference Input' to time the video output to house reference.**
Reference Type		**Select to use either analogue tri-level signal or Black and Burst for the synchroniser reference input.**
Incompatible Reference		**Select the source for the synchroniser reference during periods when the reference input signal is incompatible with the input video standard. This control is only activated during the periods of incompatible reference. The synchroniser will return to using the selected genlock source when the reference returns to compatibility.**
Output		**Select 'Follow Input' for the output standard to be the same as the genlock source. This is the normal mode of operation. Select 'User Set' to force the output video to be the standard selected below it, regardless of the selected genlock source. Beware that the frame synchroniser will attempt to generate the selected output standard which will produce a disturbed video output if the video input is of a different standard. Only normally use this control when using ViViD 3G to internally generate black, blue or bars with the 'Force Output' controls of the 'Output Configure' menu.**

Output Video Standard		**Choose one of the ten possible output video standards to use if 'User Set' is selected when internally generating video. (See comments for 'User Set' control above.)**

Output Configure

These controls select the output video by force or if the input fails.

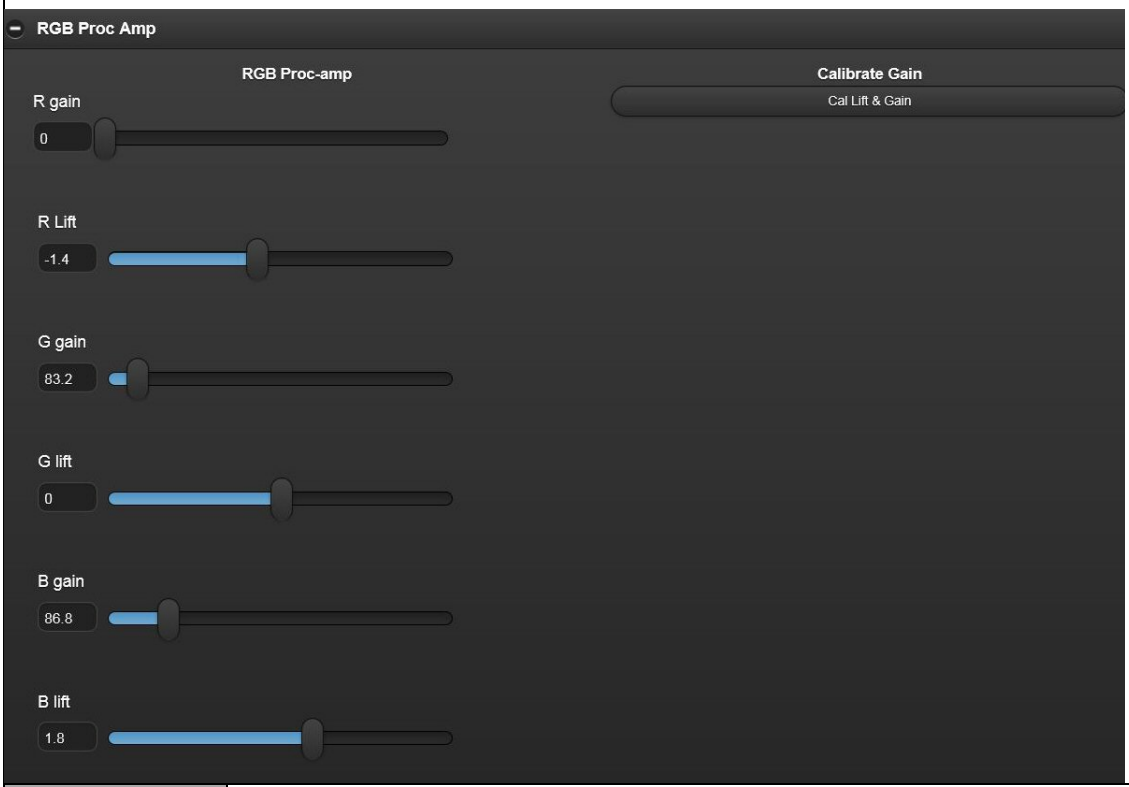


Force Output		**Force output to the selected state.**
Freeze 3s then	**Select to enable a three second freeze of last received input frame in the event of the video input disappearing before outputting black, blue, bars etc. as selected by the Output control below.**	

Output		**Select output video condition in the event of the input video missing.**
Blank Enable Hanc/Vanc	**Select to blank horizontal or vertical ancillary data in the video signal blanking intervals.**	

RGB Proc Amp

Alter the lift and gain of the R, G and B components of the video path.

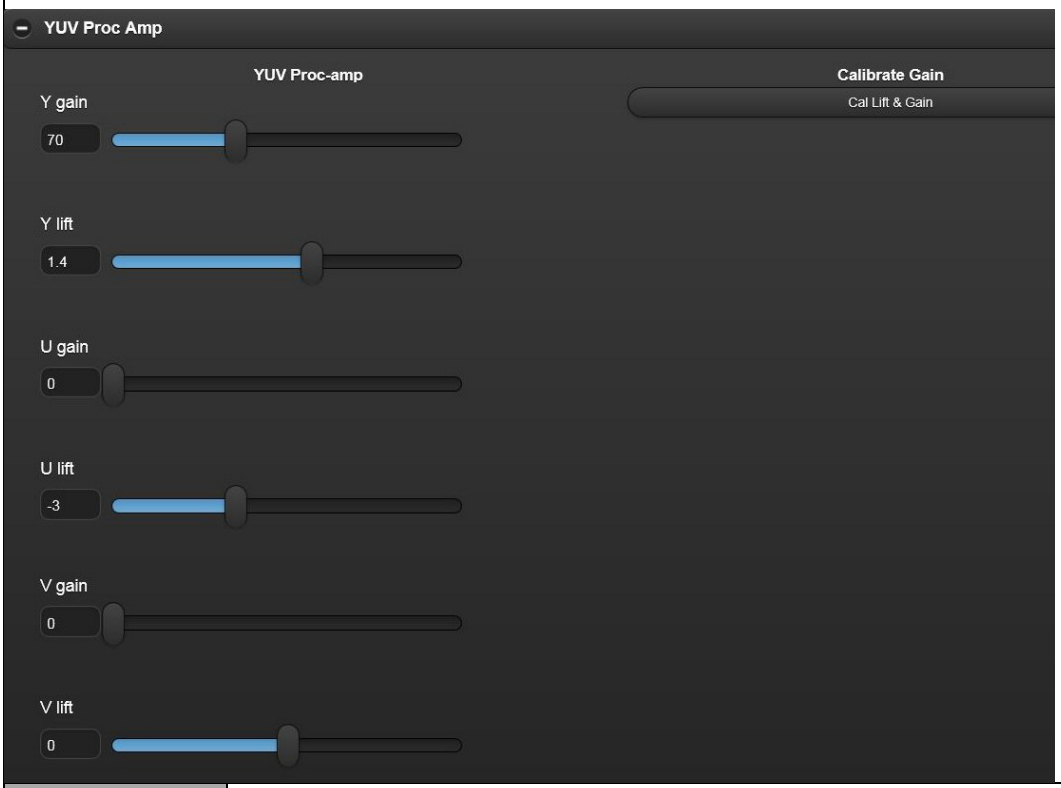


RGB Lift	**Alter the DC offset of the RGB components by +/- 10%.**

RGB Gain	**Alter the gain of the RGB components between 80% to 120%.**
Calibrate gain	**Set RGB Lift and Gain back to their calibrated values.**

YUV Proc Amp

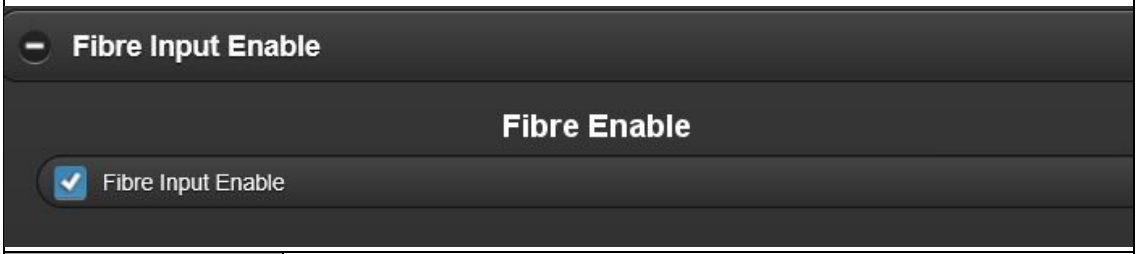
Alter the lift and gain of the Y, U and V components of the video path.



YUV Lift	**Alter the DC offset of the YUV components by +/- 10%.**
YUV Gain	**Alter the gain of the YUV components between 0% to 200%.**
Calibrate gain	**Set YUV Lift and Gain back to their calibrated values.**

Fibre Input Enable

Select fibre optic for video input.

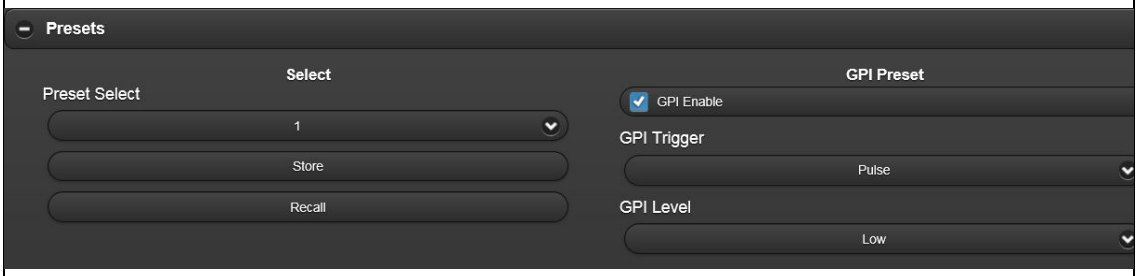


Fibre Input Enable	**Select to enable optical as the input video source instead of BNC*. N.B. The optional SPF module and correct rear module must be fitted.***

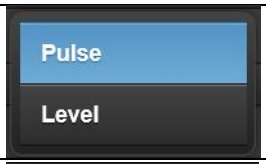
Presets, Resets And GPOs

Presets

Up to 16 user-defined configurations may be stored and recalled either from VisionWeb or through the use of external GPIs. Presets store the board setup data including operating mode card status.

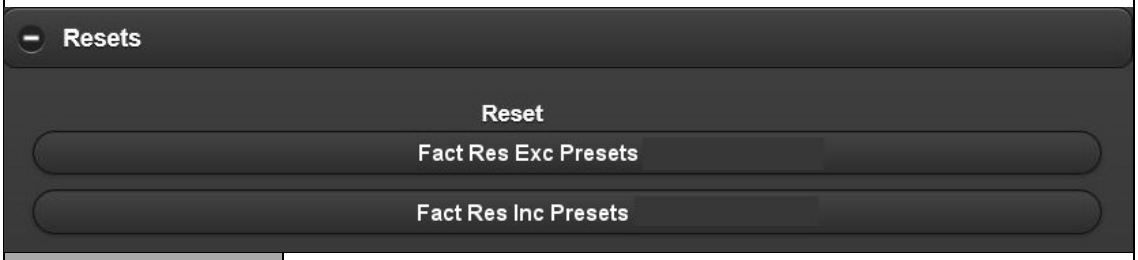


Preset Select		**Select from 1-16 which preset to store or recall.**
Store	**Save the setup in preset memory 1-16.**	
Recall	**Restore the selected preset.**	
GPI Enable	**Select to recall previously saved presets via the external GPI port. See chapter 'General Purpose Interface' for more information on GPIs.**	

GPI Trigger		**Select either level or pulse to trigger GPI recall.**
GPI Level		**Select either active low or high level to trigger the GPI recall.**

Resets

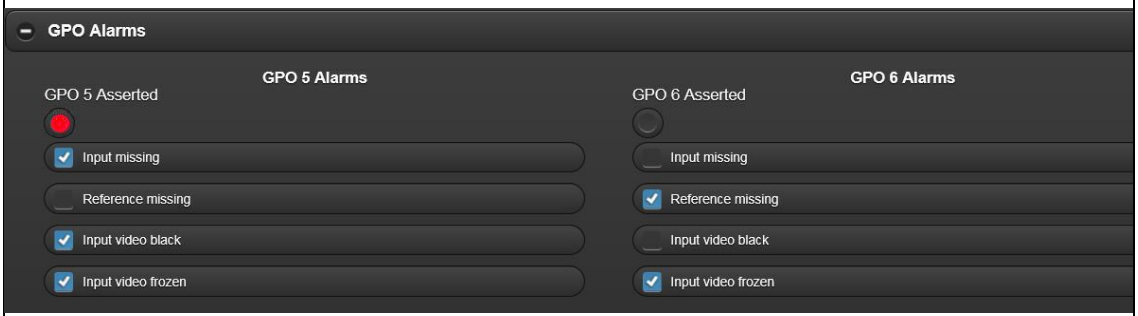
Reset ViViD 3G settings to default values.



Fact Res Exc Presets	**Reset the board to default settings but leave preset memories unaffected.**
Fact Res Inc Presets	**Reset the board to default settings and erase preset memories.**

GPO Alarms

The GPO 5 and GPO 6 outputs are reserved for alarm indication and may each be assigned to any of the three video alarm conditions (four conditions on 3GS and 3GS-20). Black and Frozen alarms have a delay timer to set the amount of time that the alarm condition must exist before the GPO is asserted.

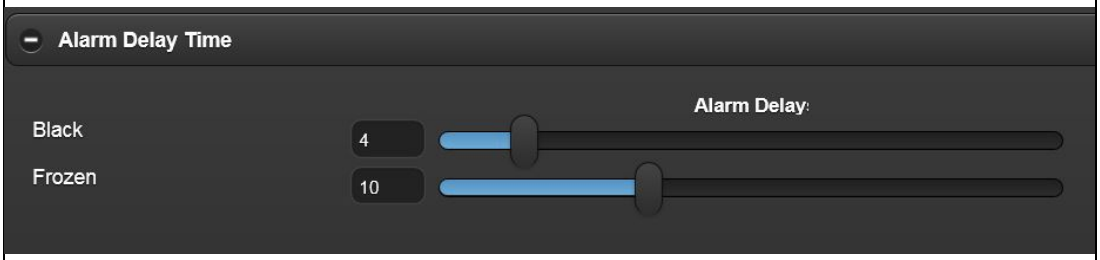


GPO 5/6 Asserted	**On if the alarm conditions are met.**

Reference Missing	**Assert if video reference missing (3GS and 3GS-20 models only).**
Input Video Black	**Assert GPO if input video is black for the period set by the '*Black Delay*' control.**
Input Video Frozen	**Assert GPO if input video is still-frame for the period set by the '*Frozen Delay*' control.**

Alarm Delay Time

Set the time that the 'Input Video Black' and 'Input Video Frozen' conditions must be active before the alarms are asserted.

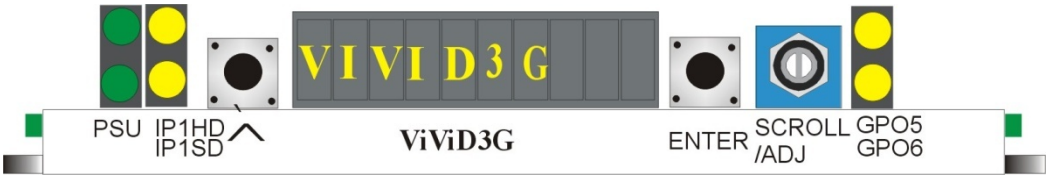


Black	**Set the time period that the video input must remain black before asserting the GPO. Can be set in the range 1 to 30 seconds.**
Frozen	**Set the time period that the video input must remain frozen before asserting the GPO. Can be set in the range 1 to 30 seconds.**

7 Troubleshooting

Card edge monitoring

The front edge of the card provides useful power rail monitoring and input status.



ViViD 3G front edge view

See *Card edge controls* for explanation of card edge LEDs.

The card edge LEDs and 10-digit display may be used in conjunction with status information from any connected remote status panel display or from VisionWeb or Statesman if available.

Board edge control was removed from ViViD 3G in 2019. Therefore the card edge control information is only relevant for older versions of the product.

Basic fault finding guide

The Power OK 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 input is present and that any cabling is intact

The video output exhibits jitter

Check that the input SDI stability is within normal limits

The card no longer responds to card edge or front panel control

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

Check any active control panel cabling

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

If necessary reset the card

Resetting the card

If required, the card may be reset by removing the card from the rack and then re-inserting it

It is safe to re-insert the card whilst the rack is powered. Any previous configuration will be retained, use a factory reset to erase any configurations stored in the card.

8 Specification

General

Dimensions	100mm x 266mm module with DIN 41612 connector.
Weight	200g.
Power consumption	ViViD 3G - 11.9 Watts. FIP - 0.6 Watts. FOP - 0.6 Watts.

Inputs

Video	HD or SD SDI 270 Mb/s to 2.970 Gb/s serial digital compliant to EBU 3267-E, SMPTE 259, SMPTE 292-1 and SMPTE 424/425-A. Cable Equalisation: 3G (2.970Gb/s) – 80 metres, Belden 1694A or equivalent. HD (1.485Gb/s) – 140 metres, Belden 1694A or equivalent. SD (270Mb/s) >250 metres, Belden 8281A or equivalent. Automatic de-embedding to SMPTE 272M or SMPTE 299M. SC optical input.
Video standards supported	1080p 50/59.94, 1080i 50/59.94, 720p 50/59.94, 1080psf 23.98/24, PAL, NTSC. Input format auto selected.
Return loss	50Mhz to 1.5GHz -15dB.

Outputs

Video	Serial output: 270Mb/s to 2.970Gb/s serial compliant to EBU 3267-E, SMPTE 259, SMPTE 292-1 and SMPTE 424/425-A. Output follows the input format. Audio is embedded to SMPTE 272M or SMPTE 299M. SC optical outputs.

Video delay

Video delay	Maximum adjustable video delay from 0.4 to 110 seconds depending on ViViD 3G model and video format.
Auxiliary data	Auxiliary data passed unless set to blank.

Rear Module I/O

RM41	One video input and four video outputs, 75 ohm BNC. Sync input for ViViD 3GS and 3GS-20 versions.
RM57	One video input and three video outputs, 75 ohm BNC. Optical SC input/output. Sync input for ViViD 3GS and 3GS-20 versions.
RM67	As RM41, but relay bypass switch auto connects video IP to OP3 in the event of power failure.

Status monitoring

LEDs	Front of card edge LED indicators to indicate: PSU rails present, SDI input HD/SD, GPI Out 5 active, GPI Out 6 active.

GPI inputs

Number and type:	4 x GPI inputs. Recall of 16 presets. Active pull to ground, pulled up to +5V through 7 kohm. Pulse mode GPI to be asserted for min. of 40mS and at least 2mS before vertical interval.

GPI outputs

Number and type:	2 x GPI outputs, assignable to any of alarm conditions: video input missing, black or frozen – plus reference missing on 3GS and 3GS-20. Electrically: Open collector transistors 30V, 270 ohm current limit resistors. Pulled up to +5V through 7 kohm.

Input fail output

Type:	Black, Blue, Bars, Last Frame or No Output as selected.

Control

Local:	Intuitive board edge interface with two select buttons, shaft encoder and ten character alphanumeric display.
Remote:	RS422/485. 19200 baud, 8 bits, 1 stop no parity. Control from frame active front panel and remote panel. VisionWeb Control is available via the web server on the frame and allows operation using a standard web browser on a PC or tablet. Statesman allows control from any PC on a network. SNMP control and monitoring via frame CPU and Ethernet connection. SNMP traps can be set on the following alarms: input missing, video black, video frozen, reference missing, reference incompatible and input audio missing.

9 Appendix 1

Statesman

In July 2014, Statesman control of ViViD 3G was superceded by VisionWeb control. Statesman is no longer supported after this date, but information for existing users is included in this appendix.

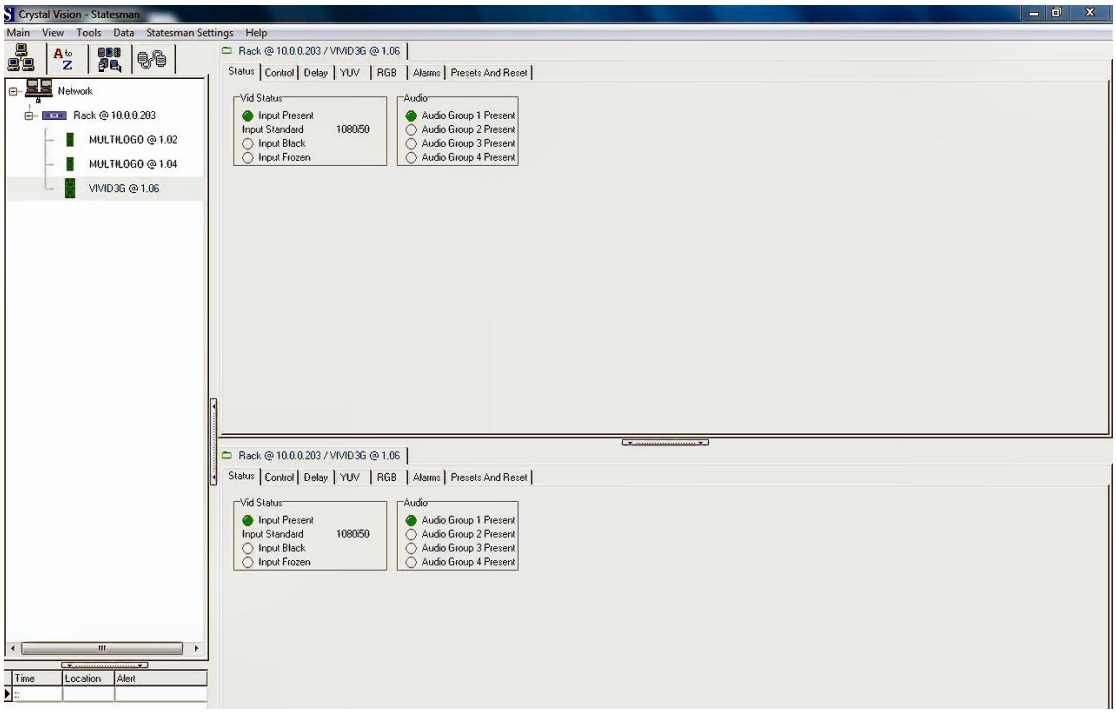
Introduction

The Crystal Vision Statesman PC control software is designed to control a range of Crystal Vision modules via Ethernet 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 a Statesman-capable front panel CPU or full active control panel. Either of these must be fitted to the frame to allow Statesman control.

Statesman operation

The initial view 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 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 pane or drag the button to vary the size of the panes.

***Note**: For further information on Statesman configuration please refer to the Statesman manual.*

Control Descriptions

The controls of ViViD 3G are accessible from the front panel, the board edge or from Crystal Vision's Statesman software. The description of controls used in this manual is based on Statesman but the path to locate controls via the front panel or board edge follows the same logic. For instance, in the Statesman GUI the 'Input Frozen' control is located in the '**Video Status'** group of the '**Status'** tab. To find the same control using the card edge or front panel follow the path **Status->Vid Status** to the **Input Frozen** control.Statesman GUI controls are located in a number of tabs each containing panels which mostly contain the controls. Some controls are LEDs that are used to show status, others are check boxes, buttons or sliders which change various ViViD 3G settings.The description of the tabs are in the order shown in the GUI i.e.

STATUS, CONTROL, SYNCHRONISER *('3GS and 3GS-20' models only)***, DELAY, YUV, RGB, ALARMS, PRESETS AND RESET.**

Each tab is shown with a screen grab and description of each control's function.

Status (3G and 3G-20)

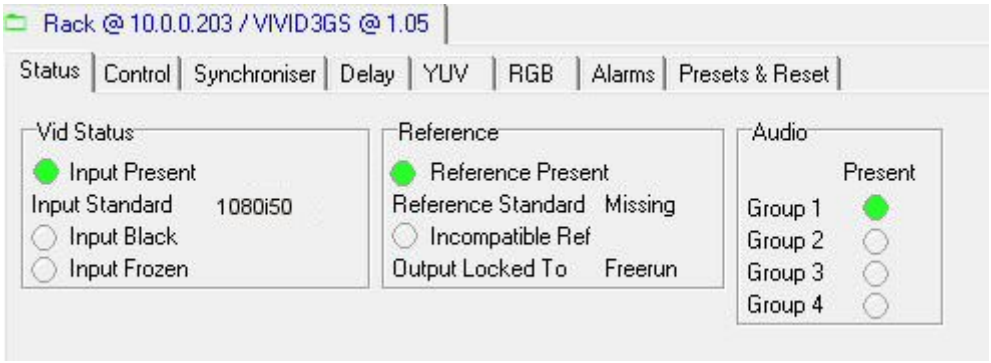
The board status is shown using a mixture of simulated LEDs and text information. As a general rule a green LED shows a good condition such as input present. An amber LED will give a warning as with video black or video frozen. If a LED turns red this is a fault condition. A greyed LED will indicate an absence such as non-alarm or non-warning status.

Status		
Vid Status	Input Present	On when video input present.
	Input Standard	Shows input video standard e.g. 1080p 50.
	Input Black	On when input video is black level.
	Input Frozen	On when input video is frozen.

Audio	**Audio Group 1-4 Present**	**On when audio groups 1-4 are embedded into the video output.**

Status (3GS and 3GS-20)

The board status is shown using a mixture of simulated LEDs and text information. As a general rule a green LED shows a good condition such as input present. An amber LED will give a warning as with video black or video frozen. If a LED turns red this is a fault condition. A greyed LED will indicate an absence such as non-alarm or non-warning status.

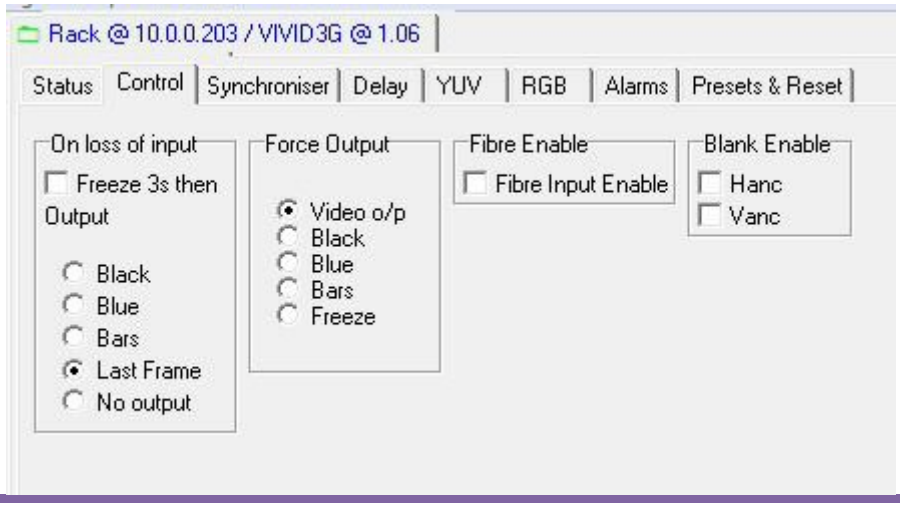


Status

Vid Status	**Input Present**	**On when video input present.**
	Input Standard	**Shows input video standard e.g. 1080p 50.**
	Input Black	**On when input video is black level.**
	Input Frozen	**On when input video is frozen.**
Reference	**Reference Present**	**On when reference present.**
	Reference Standard	**Shows reference standard e.g. 1080p 50.**
	Incompatible ref	**On when video refererence is incompatible with input standard.**
	Output Locked To	**Displays genlock source i.e Input, Reference or Freerun if no valid input or reference input.**
Audio	**Group1-4 Present**	**On when audio groups 1-4 are embedded into the video output.**

Control

The Control tab contains the ViViD 3G configuration controls.

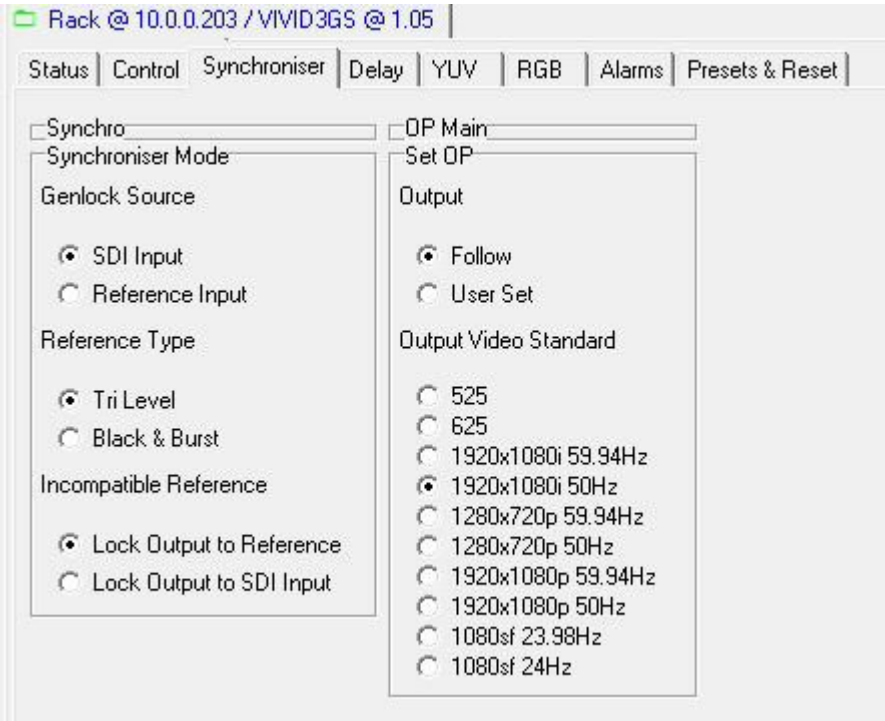


Control		
On Loss of Input	Freeze 3s then	Select to enable a three second freeze of last received input frame in the event of the video input disappearing before outputting black, blue, bars etc. as selected by the Output control below.
	Black, Blue, Bars, Last Frame, No output	Select output video condition in the event of the input video missing.
Force Output	Video o/p, Black, Blue, Bars, Freeze	Force output to the selected state.
Fibre Enable	Fibre Input Enable	Select to enable optical as the input video source instead of BNC. *N.B. The optional SPF module and correct rear module must be fitted.*
Blank Enable	Hanc Blank	Select to blank horizontal ancillary data in the video signal.
	Vanc Blank	Select to blank vertical ancillary data in the video signal vertical interval.

Synchroniser

(3GS and 3GS-20 only)

The Synchroniser tab contains the ViViD 3GS and 3GS-20 synchroniser controls.



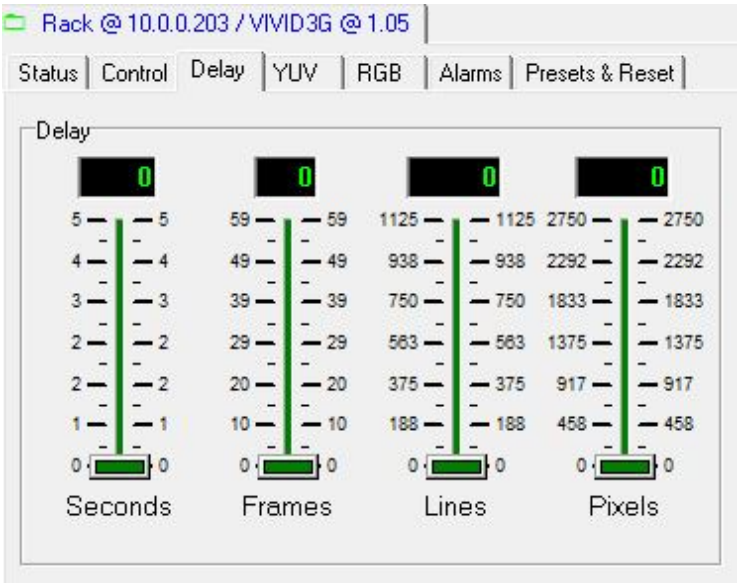
Synchroniser

Genlock Source	**SDI Input**	**Select the SDI video input as the reference source for the synchroniser output. Use this if the reference signal is missing or of a different standard to the input.**
	Reference Input	**Select the reference input as the reference source for the synchroniser output. Use this to time the video output to house reference.**
Reference Type	**Tri Level/Black & Burst**	**Select to use either analogue tri-level signal or Black and Burst for the synchroniser reference input.**
Incompatible Reference	**Lock Output to Reference**	**Lock the video output to the reference input if the reference signal is incompatible with the input video standard. This control is only activated during the periods of incompatible reference. The synchroniser will return to using the selected genlock source when the reference returns to compatibility.**
	Lock Output to SDI Input	**Lock the video output to the SDI input if the reference signal is incompatible with the input video standard. This control is only activated during the periods of incompatible reference. The synchroniser will return to using the selected genlock source when the reference returns to compatibility.**

Output	Follow	Set output standard to be the same as the genlock source. This is the normal mode of operation.
	User Set	Force the output video to be the standard selected below regardless of the selected genlock source. Beware that the frame synchroniser will attempt to generate the selected output standard which will produce a disturbed video output if the video input is of a different standard. Only normally use this control when using ViViD 3G to internally generate black, blue or bars with the 'Force Output' controls of the Control Tab.
Output Video Standard	525,625....1080sf 24Hz	Choose one of the ten possible output video standards to use if 'User Set' is selected when internally generating video. (See comments in 'User Set' control above.)

Delay

These controls set the length of the delay period in seconds, frames, lines and pixels. The maximum delay that can be achieved varies from 0.4 seconds to 110 seconds depending on the ViViD 3G model used and the input video standard. Statesman recognises the ViViD model fitted and adjusts the maximum delay to five seconds for 3G and 3GS models and 110 seconds for 3G-20 and 3GS-20. The maximum delay that can be set by the controls is auto limited according to the video standard. In the example below the maximum delay is just over five seconds which is the most achievable for the ViViD 3G model with an SD 625 line input.

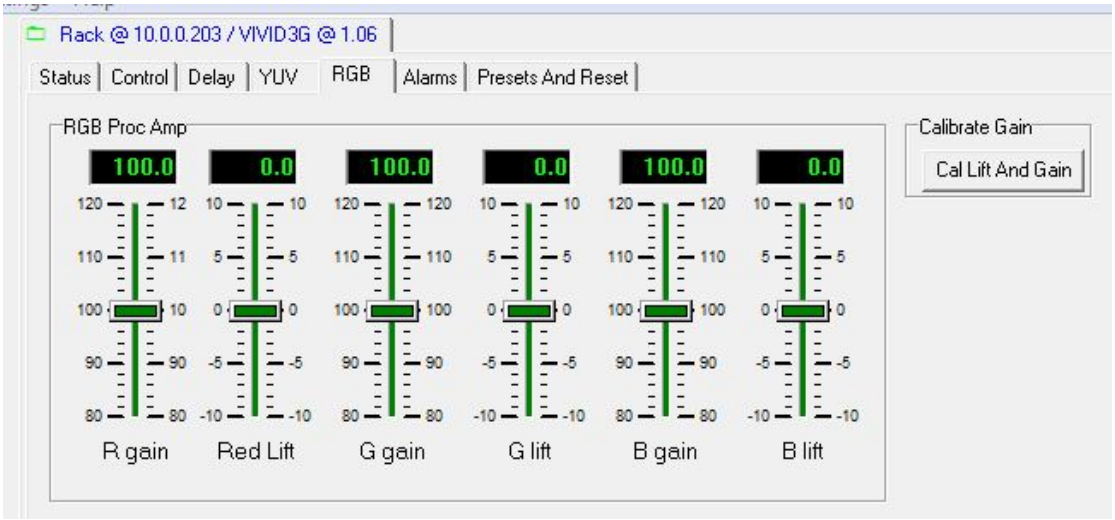


Delay

Delay Seconds, Frames, Lines, Pixels	Use these controls to set the variable delay from 0 to the maximum possible for the ViViD 3G model used. *Note that the maximum delay value may not be achievable with all input video standards. See 'Video Delays in ViViD 3G' on pages 6-7.*

RGB

The video proc-amp allows adjustment of the individual RGB lift and gain of the signal path.

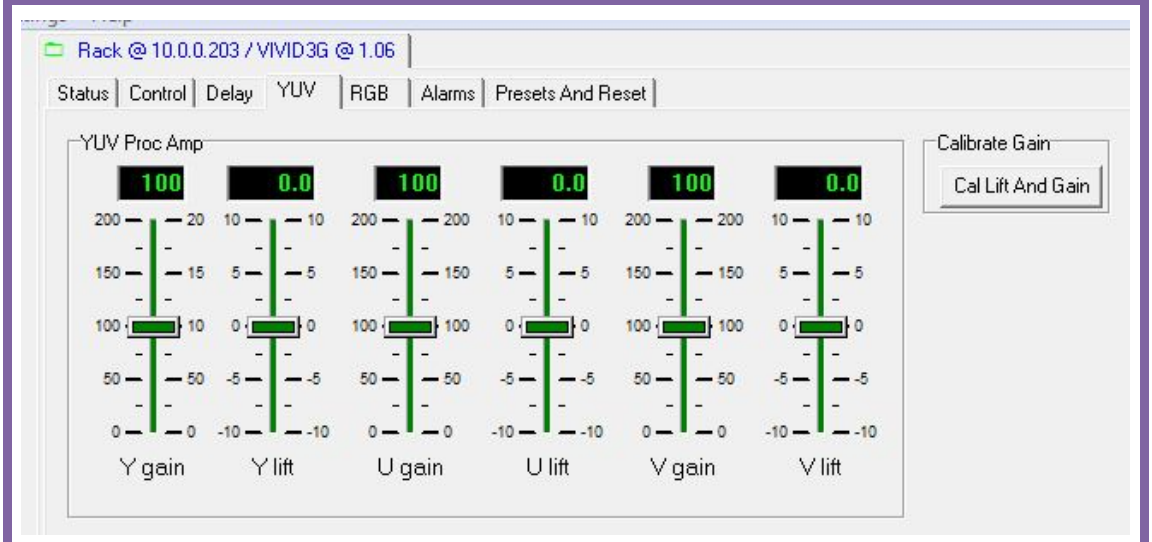


RGB

Modify the output video signal by altering the levels of the individual colour components in the RGB domain.	
Red/Green/Blue Lift	**Offset the colour component by +/- 10%.**
Red/Green/Blue Gain	**Modify the gain of the colour component from +80% to +120%.**
Cal Lift and Gain	**Set lift and gain to calibrated values.**
N.B. The values set by these controls are not reflected by the YUV Proc-Amp tab.	

YUV

This video proc-amp allows adjustment of video gain, black level and independent YUV gains. The maximum increase in overall gain allowed is 200%; should any combination of controls be set where this maximum would be exceeded, the gain will be limited to 200%.

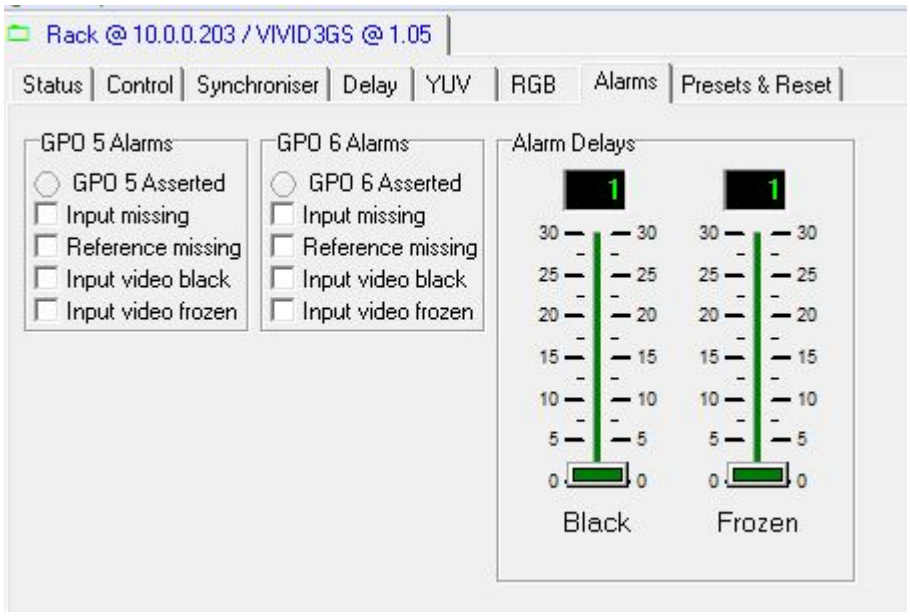


YUV

Modify the output video signal by altering the levels of the individual colour components in the YUV domain.	
Video Gain	**Modify the gain of the whole video signal from 0 to +200%.**
Y Lift	**Offset the luminance component by +/- 10%.**
Y Gain	**Modify the luminance gain from 0 to +200%.**
U/V Lift	**Offset the U or V component by +/- 10%.**
U/V Gain	**Modify the U or V component gain from 0 to +200%.**
Cal Lift and Gain	**Set lift and gain to calibrated values.**
N.B. The values set by these controls are not reflected by the RGB Proc-Amp tab.	

Alarms

The GPO 5 and GPO 6 outputs are reserved for alarm indication and may each be assigned to any of the three video alarm conditions (four conditions on 3GS and 3GS-20). Black and Frozen alarms have a delay timer to set the amount of time that the alarm condition must exist before the GPO is asserted.

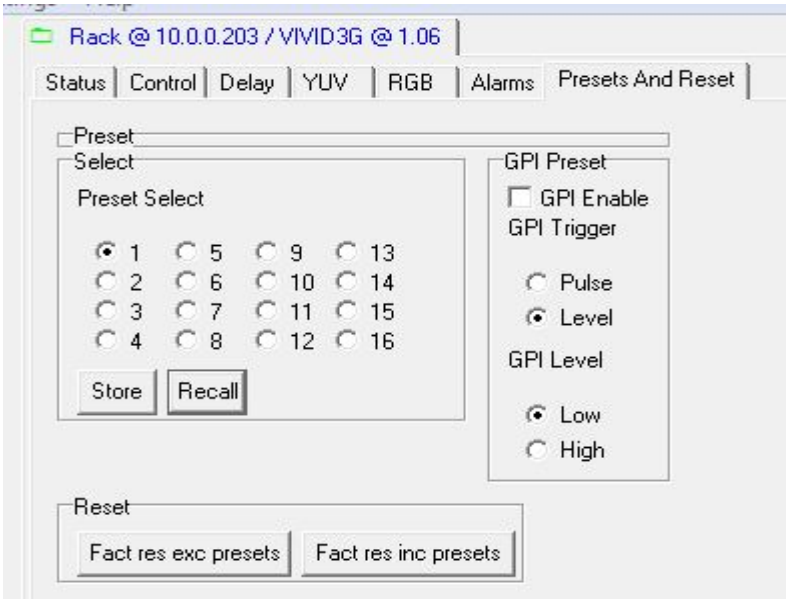


Alarms

Set the various conditions that assert GPO 5 and GPO 6.	
GPO 5/6 Asserted	**On if GPO is asserted. *N.B. Visual indication of GPO status is provided on the board edge.***
Input missing	**Assert GPI output if video input is missing.**
Refererence missing	**Assert if video reference missing (3GS and 3GS-20 models only).**
Input video black	**Assert GPO if input video is black for the period set by the '*Black Delay*'.**
Input video frozen	**Assert GPO if input video is still-frame for the period set by the '*Frozen Delay*' control.**
Black delay	**Set the time period that the video input must remain black before asserting the GPO. Can be set in the range 1 to 30 seconds.**
Frozen delay	**Set the time period that the video input must remain frozen before asserting the GPO. Can be set in the range 1 to 30 seconds.**

Presets and Resets

Up to 16 user-defined configurations may be stored and recalled either from Statesman or through the use of external GPIs. Presets store the board setup data including operating mode card status. The presets are numbered 1-16. Reset the board to factory (default) settings.



Presets and Resets		
Select	**Preset Select**	**Select which preset to store or recall.**
	Store	**Save the setup in preset memory 1-16.**
	Recall	**Recall the setup from preset memory 1-16.**
GPI Preset	**GPI Enable**	**Select to recall previously saved presets via the external GPI port. See Chapter 4 for more information on GPIs.**
	GPI Level	**Select either low or high level to trigger the GPI recall.**
	GPI Trigger	**Select either level or pulse to trigger GPI recall.**
Reset	**Fact Res Exc**	**Reset the board to default settings but leave preset memories.**
	Fact Res Inc Presets	**Reset the board to default settings and erase preset memories.**