

USER MANUAL

 **Indigo**
SYSTEM



SW221 3G

3G/HD/SD 2 x 2 switch

Crystal  **Vision**

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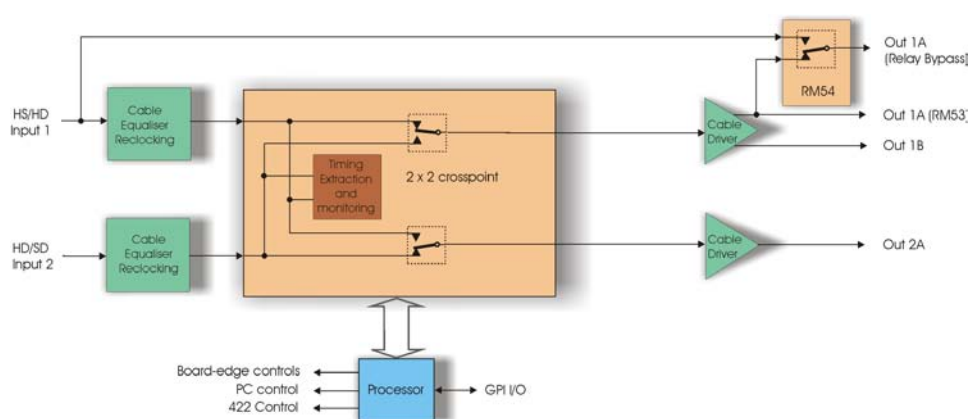
Revision 1.	Routing reconfigured and GPI controls added.	01-11-10
Revision 2.	GPI control table added to page 6.	07-12-10
Revision 3.	Output 2 switch selection amended. Pages 12 & 18.	09-02-11
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1 Introduction

The SW221 3G provides simple 2 x 2 switching of 3G, HD or SD signals, making it ideal for use either as an emergency transmission switch or to manually bypass products requiring maintenance in a 24 hour station.

The SW221 3G is ideal for switching between the main and backup feeds of a television station, and offers independent control of the two outputs. With manual switching there is the choice of switching between two feeds either immediately or in the vertical blanking period, with the SW221 3G detecting the video standard and switching at the appropriate point to enable a cleaner switch.

An automatic switch away from a faulty source is triggered immediately on loss of input or invalid video, determined by loss of the sync word structure. A single format can be set as valid, allowing the SW221 3G to automatically switch away from inputs that are legal but not the correct format. Switching back can either be automatic or by user intervention. When set to automatic the board will switch back if the original input returns to a valid state, with a programmable delay ensuring that the previously faulty input remains good for the selected time period. When set to user activated it will stay on the new selection until the routing is changed by the operator, or the new input becomes invalid.



The SW221 3G card can be controlled by Statesman PC control software, active control panel such as the REMIND-E, SNMP or from its card edge controls.

The main features of SW221 3G are:

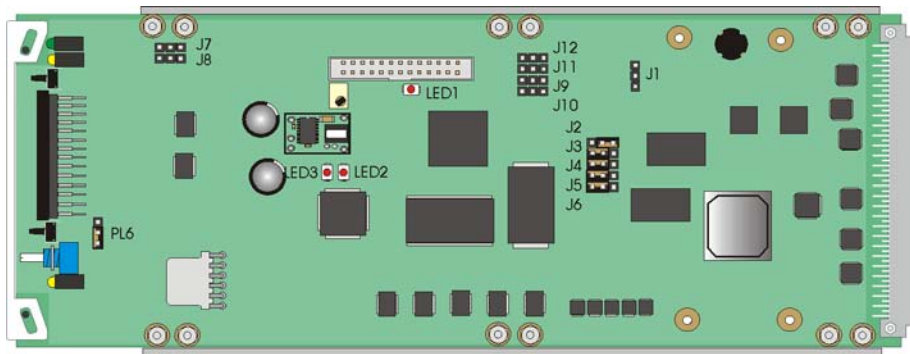
- 2 x 2 switch which works with 3G, HD and SD
- Manual switch either immediately or timed
- Automatic switching on detection of missing input, invalid signal or format
- Flexible control, including board-edge, Statesman and remote panels, SNMP and GPIs
- Space-saving: 100mm x 266mm module allowing 24 SW221 3G in 4U

The SW221 3G fits in Crystal Vision's four standard frames and can be integrated with any boards from the company's full product range. The RM53 and RM54 are the frame rear modules. The RM54 has the benefit of relay bypass on out A.

2 Hardware installation

The SW221 3G single height module uses the RM53 and RM54 rear connectors, and will fit into all of the Crystal Vision rack frames. All modules can be connected or removed while the frame is powered, without damaging the board.

2.1 Module configuration



SW221 3G

Link configuration and LEDs

There are 13 jumper links and three surface-mounted LEDs on the SW221 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	→	Ethernet comms	→
J9-12		na		na		na
J1	External reference input termination. 1-2 75R, 2-3 Hi Z					
J2	Leave in position 1-2 →					
J7 J8	Not used					
PL6	2-3 (lower) selected IP address. 1-2 (upper) forced IP address 10-0-0-201					
LED1	CPU configuration in progress					
LED2	Ethernet Data					
LED3	Ethernet Link					


Note: Links J1-12 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 frames will house up to 12 single height modules and dual power supplies. The 1U Indigo 1 frames will house six single height modules and a single power supply. The Indigo DT desktop box has a built-in power supply and will house up to two single height modules.

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

Rear module connections with RM53

RM53 fits in all frames	Description
	RM53 <ul style="list-style-type: none"> • 24 SW221 3G modules per Indigo 4 frame • 12 per Indigo 2 frame • Six per Indigo 1 frame • Two per Indigo DT • All frame slots can be used

Rear module connections with RM54

RM54 fits in all frames	Description
	RM54 <ul style="list-style-type: none"> • 24 SW221 3G modules per Indigo 4 frame • 12 per Indigo 2 frame • Six per Indigo 1 frame • Two per Indigo DT • All frame slots can be used

RM53 BNC	RM54 BNC	I/O assignment
HD/SD IN 2	HD/SD IN 2	Serial Digital Input 2 (Aux or Standby Input)
HD/SD IN 1	HD/SD IN 1	Serial Digital Input 1 (Main Programme Input)
HD/SD OUT 1A	HD/SD OUT 1 (switched)	Reclocked SDI output (Programme Out) with relay bypass protection (RM54 only)
HD/SD OUT 1B	HD/SD OUT 1 (Unswitched)	Reclocked SDI output (Programme Out) with no relay bypass protection
HD/SD OUT 2A	HD/SD OUT 2	Reclocked SDI output (User selectable)
HD/SD OUT 2B	NC	No user connection

2.3 General Purpose Interface (GPI)

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

GPI	Low (<1V)	High (+5V)	Notes
1	'a'		Held low for tally
2	'b'	See configuration table	Held low for tally
3	'c'		Held low for tally
4	'd'	See configuration table	Held low for tally
5	'e'	Input 1 present	Input 1 absent
6	'f'	Input 2 present	Input 2 absent

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

The GPI inputs can be used to control input selection/routing and are configurable for either edge or level triggered. They can also be used to give a tally of the selection/routing. When GPI control is selected to 'level' GPI = High (floating) selects Input 1 and GPI = Low (pulled to ground) selects Input 2.

Output A and output B both have individual GPI controls/tally's and can be selected to perform the following functions.

Output A	Output B
No GPI control. Tally on 'b'	No GPI control. Tally on 'd'
Level on 'a'. Tally on 'b'	Level on 'c'. Tally on 'd'
Edge on 'a'. Tally on 'b'	Edge on 'c'. Tally on 'd'
Edge on 'a' and 'b'. Tally on 'a' and 'b'	Edge on 'c' and 'd'. Tally on 'c' and 'd'
Edge on 'a' and 'b'. No tally	Edge on 'c' and 'd'. No tally

4U frame GPI connections

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

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

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

Table shows pin number (Remote number)

Note: Remote 1, Remote 3, Remote 5 and Remote 7 are 26-way high-density D-Type female sockets. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.
Remote 2, Remote 4, Remote 6 and Remote 8 are 26-way high-density D-Type male plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2 and Remote 6.
Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1amp. Remotes 5-8 are similarly protected.

2U frame GPI connections

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

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

Table shows pin number (remote number)

Note: Remote 1 and Remote 3 are 26-way high-density D-Type female sockets. Frame ground is pin 2 and +5V @500mA is pin 1 in each case.
Remote 2 and Remote 4 are 26-way high-density D-Type male plugs and frame ground is pin 6 in each case and +5V @500mA is pin 15 on Remote 2.
Note. The +5V output is protected by self-resetting thermal fuses, which limit the total output current available from Remotes 1-4 to approximately 1amp.

1U frame GPI connections

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

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

Table shows pin number (remote number)

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

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

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

Indigo DT desk top box GPI connections

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

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

Table shows pin number (remote number)

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

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

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

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



SW221 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
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	
IN1 OP1	Yellow	Output 1 showing input 1	
IN2 OP1	Yellow	Output 1 showing input 2	
IN1 OP2	Yellow	Output 2 showing input 1	
IN2 OP2	Yellow	Output 2 showing input 2	

3.5 Navigating card edge menus

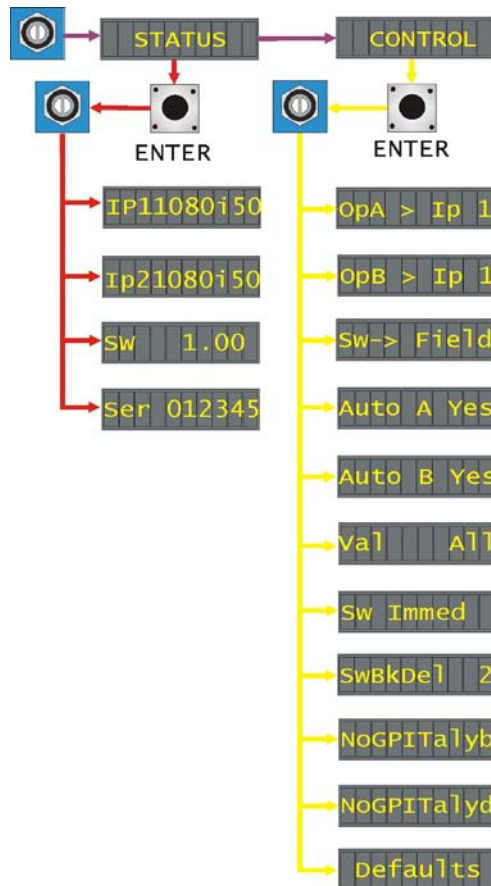
To access the card edge menu system proceed as follows:

- 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 then SCROLL to access the Status menu list.

STATUS	Menu	Comment
Ip11080i50	Input 1 video standard	The Input 1 video standard is shown. <i>1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, 525, Unknown, Missing.</i>
Ip21080i50	Input 2 video standard	The Input 2 video standard is shown. <i>1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, 525, Unknown, Missing.</i>
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.

Control menu

From the Status top menu rotate SCROLL to display the Control menu. Press ENTER to enter the Control menu and rotate SCROLL to show the available options. To select an option press ENTER, this will cause the display text to change from a normal font to an italic font showing the option has been selected. Rotate SCROLL to set the required variable and press ENTER to fix the selection.

CONTROL	Menu	Comment
OpA > Ip 1	Output 1 selection	Rotate the Scroll/Adj. control to show Output 1 selection. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. <i>Input 1, Input 2.</i>
OpB > Ip 1	Output 2 selection	Rotate the Scroll/Adj. control to show Output 2 selection. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. <i>Input 1, Input 2, Follow A, Not A.</i>
Sw-> Field	Switching mode	Rotate the Scroll/Adj. control to show Switching mode. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. <i>Frame, Field, Immediate.</i>
Auto A Yes	Automatic switching mode	Rotate the Scroll/Adj. control to show automatic switching mode. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. <i>Yes, No.</i>
Auto B Yes	Automatic switching mode	Rotate the Scroll/Adj. control to show automatic switching mode. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. <i>Yes, No.</i>
val All	Valid input standard selection	Rotate the Scroll/Adj. control to show Valid input standard. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. <i>All, 1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, 525.</i>
Sw Immed	Switching characteristic	Rotate the Scroll/Adj. control to show the switching control. Press ENTER and rotate Scroll/Adj. to select. <i>Immediate, Delayed, Latch.</i>
SwBkDel 10	Switch back delay	Rotate the Scroll/Adj. control to show Switch back Delay. Press ENTER and rotate Scroll/Adj. to select. <i>2-60 seconds</i>
NoGPITalyb	Output A GPI control	Rotate the Scroll/Adj. control to show Output A GPI control menu. Press ENTER and rotate Scroll/Adj. to select. <i>No GPI control, tally on "b". Level on "a", tally on "b". Edge on "a", tally on "b". Edge on "a" & "b", tally on "a" & "b". Edge on "a" & "b", no tally.</i>

NoGPITallyd	Output B GPI control	Rotate the Scroll/Adj. control to show Output B GPI control menu. Press ENTER and rotate Scroll/Adj. to select. <i>No GPI control, tally on "d". Level on "c", tally on "d". Edge on "c", tally on "d". Edge on "c" & "d", tally on "c" & "d". Edge on "c" & "d", no tally.</i>
Defaults	Factory defaults	Rotate the Scroll/Adj. control to show Defaults. Press ENTER to active selection then press ENTER to load factory default values.

Switch controls

Both outputs 1 and 2 can be routed individually to connect to either input 1 or input 2. Should an error occur on one of the outputs associated input, the output can be selected to automatically route away from the faulty input to the remaining good input by selecting the automatic switching mode. The monitored error conditions are - no input and incorrect input standard. The valid input standard is selectable from the valid input standard menu.

Switching mode

The switching modes available are Frame, Field or Immediate. These switching modes are effective with either a manual switch or automatic switch. In Immediate mode the SW221 3G will act immediately but this untimed 'crash' switch is likely to cause a picture disturbance. Selecting either Field or Frame under non-catastrophic error conditions will allow the SW221 3G to switch away in a more tidy manner, assuming that the two inputs are co-timed.

Switch back

Once a switch has taken place automatic switch back will be controlled by the switch back control. Immediate mode allows the switch to return once the error has disappeared for at least one frame. In certain circumstances this could result in the output flip-flopping between the two inputs erratically. To avoid this, the switching action can be either delayed or latched.

GPI configuration

The GPI inputs can be used to control input selection/routing and are configurable for either edge or level triggered. They can also be used to give a tally of the selection/routing. When GPI control is selected to 'level' GPI = High (floating) selects Input 1 and GPI = Low (pulled to ground) selects Input 2.

Output A and output B both have individual GPI controls/tally's and can be selected to perform the following functions.

Output A	Output B
No GPI control. Tally on 'b'	No GPI control. Tally on 'd'
Level on 'a'. Tally on 'b'	Level on 'c'. Tally on 'd'
Edge on 'a'. Tally on 'b'	Edge on 'c'. Tally on 'd'
Edge on 'a' and 'b'. Tally on 'a' and 'b'	Edge on 'c' and 'd'. Tally on 'c' and 'd'
Edge on 'a' and 'b'. No tally	Edge on 'c' and 'd'. No tally

Factory Defaults

Factory defaults will return all parameters to their factory values.

Parameter	Default value
Auto switch Output A	No
Auto switch Output B	No
Routing Output A	Input 1
Routing Output B	Input 1
Output switch timing	Field
Switch mode	Immediately
Valid signal format	All
Switch back delay	2.0
GPI control Output A	No GPI control. Tally on “b”
GPI control Output B	No GPI control. Tally on “d”

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 set up 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 SW221 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 SW221 3G has been selected.



The SW221 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 upward arrow to leave and then re-enter a menu to update the display.

4.2 The SW221 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.

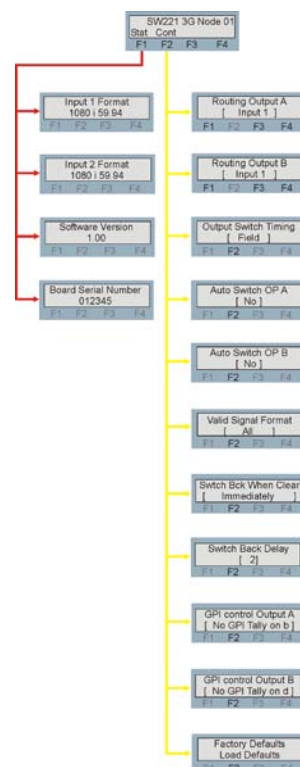
The main top-level menus for the SW221 3G are obtained by pressing the F1-F2 keys from the Home menu. Menu keys are illuminated when active and when further menus are available.

- The top-level menus are:
- Status – Press F1
- Control (Output configuration and switch functions) – Press F2

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 SW221 3G menus. The actual menus available may vary slightly as software is updated.

Active control panel menu



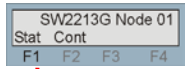
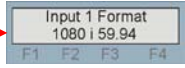
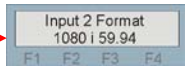

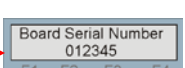
Note: Function key LEDs are illuminated when active.

Status menu

Pressing button F1 from the Home menu will enter the Status menu. This menu is traversed by rotating the shaft control.

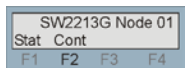
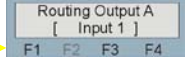
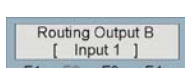
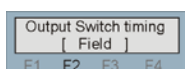
No changes can be made from this menu as it is read only.

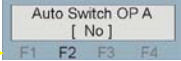
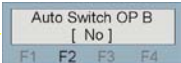



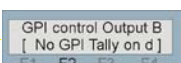
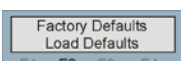
Note: Not all status information will be updated in real time. If necessary press the * button to update the display information.

Menu	Comment
	
	Input 1 video format Rotate the shaft control to view the input 1 video standard. <i>1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, 525, Unknown, Input 1 Missing.</i>
	Input 2 video format Rotate the shaft control to view the input 2 video standard. <i>1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, 525, Unknown, Input 2 Missing.</i>
	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.

Control menu

Pressing button F2 from the Home menu will enter the Control menu. Signal routing and switching configurations are found here.

Menu	Comment
	
	Output A routing Rotate the shaft control to view the Output A Video Routing selection. Press F2 to select menu. Rotate shaft control to change routing. <i>Input 1, Input 2.</i>
	Output B routing Rotate the shaft control to view the Output B Video Routing selection. Press F2 to select menu. Rotate shaft control to change routing. <i>Input 1, Input 2, Follow A, Not A.</i>
	Switch configuration Rotate the shaft control to view the Output switch timing selection. Press F2 to select menu. Rotate shaft control to make selection. <i>Immediate, Field, Frame.</i>

	Output A Automatic switch selector	Rotate the shaft control to view the Automatic Switch selection. Press F2 to select. Rotate the shaft control to make selection. Yes, No.
	Output B Automatic switch selector	Rotate the shaft control to view the Automatic Switch selection. Press F2 to select. Rotate the shaft control to make selection. Yes, No.
	Valid video format selector	Rotate the shaft control to view the Valid Signal format selection. Press F2 to select. Rotate the shaft control to make selection. All, 1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, 525.
	Switch back characteristic	Rotate the shaft control to view the switching characteristic selection. Press F2 to select. Rotate the shaft control to make selection. Immediately, Delayed, Latch.
	Switch back delay	Rotate the shaft control to view the Switch back delay setting. Press F2 to select. Rotate the shaft control to adjust. 2-60 seconds.
	Output A GPI control	Rotate the shaft control to view the Output A GPI control selection. Press F2 to select. Rotate the shaft control to make selection. No GPI Tally on b, Level a Tally b, Edge a Tally b, Edge ab Tally ab, Edge ab No Tally.
	Output B GPI control	Rotate the shaft control to view the Output B GPI control selection. Press F2 to select. Rotate the shaft control to make selection. No GPI Tally on d, Level c Tally d, Edge c Tally cd, Edge s Tally cd, Edge cd No Tally.
	Factory Defaults	Rotate the shaft control to view the Factory defaults selection. Press F2 to select and follow instructions displayed.

Switch controls

Both outputs 1 and 2 can be routed individually to connect to either input 1 or input 2. Should an error occur on one of the outputs associated input, the output can be selected to automatically route away from the faulty input to the remaining good input by selecting the automatic switching mode. The monitored error conditions are - no input and incorrect input standard. The valid input standard is selectable from the valid input standard menu.

Switching mode

The switching modes available are Frame, Field or Immediate. These switching modes are effective with either a manual switch or automatic switch. In Immediate mode the SW221 3G will act immediately but this untimed 'crash' switch is likely to cause a picture disturbance. Selecting either Field or Frame under non-catastrophic error conditions will allow the SW221 3G to switch away in a more tidy manner, assuming that the two inputs are co-timed.

Switch back

Once a switch has taken place automatic switch back will be controlled by the switch back control. Immediate mode will allow the switch to return once the error has disappeared for a minimum of one frame. In certain circumstances this could result in the output flip-flopping between the two inputs erratically. To avoid this, the switching action can be either delayed or latched.

GPI configuration

The GPI inputs can be used to control input selection/routing are configurable for either edge or level triggered. They can also be used to give a tally of the selection/routing. When GPI control is selected to 'level' GPI = High (floating) selects Input 1 and GPI = Low (pulled to ground) selects Input 2.

Output A and output B both have individual GPI controls/tally's and can be selected to perform the following functions.

Output A	Output B
No GPI control. Tally on 'b'	No GPI control. Tally on 'd'
Level on 'a'. Tally on 'b'	Level on 'c'. Tally on 'd'
Edge on 'a'. Tally on 'b'	Edge on 'c'. Tally on 'd'
Edge on 'a' and 'b'. Tally on 'a' and 'b'	Edge on 'c' and 'd'. Tally on 'c' and 'd'
Edge on 'a' and 'b'. No tally	Edge on 'c' and 'd'. No tally

Factory Defaults

Factory defaults will return all parameters to their factory values.

Parameter	Default value
Auto switch Output A	No
Auto switch Output B	No
Routing Output A	Input 1
Routing Output B	Input 1
Output switch timing	Field
Switch mode	Immediately
Valid signal format	All
Switch back delay	2.0
GPI control Output A	No GPI control. Tally on "b"
GPI control Output B	No GPI control. Tally on "d"

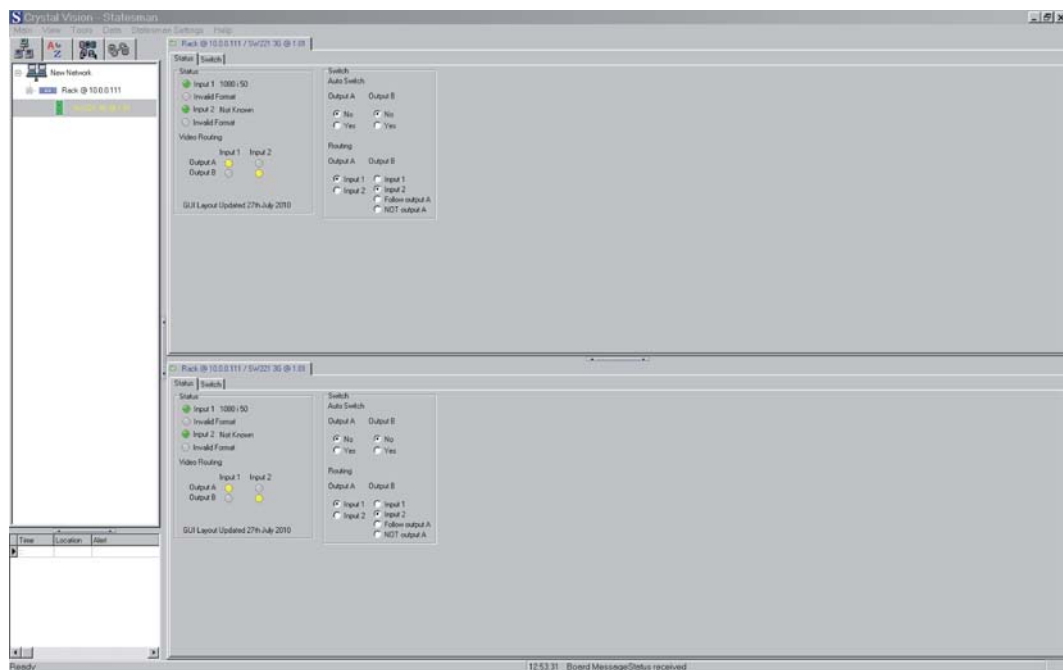
5 Statesman

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.



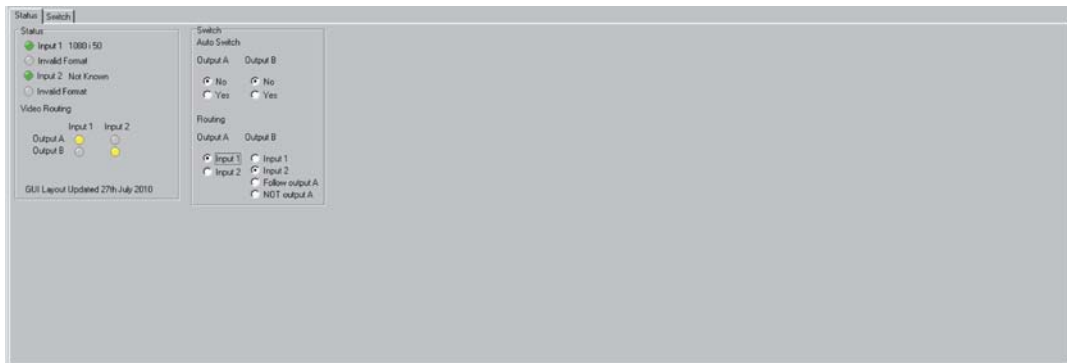
The Statesman main application window

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.

SW221 3G has two Statesman menu tabs, one that provides status information and a second that provides the routing and switching controls.

Status

The status tab is divided into two group boxes, status and switch. The information is presented as either text or by simulated LED. The colour of the LED will depend on the type and priority of the information being conveyed, red will indicate a high priority such as lack of input video, amber gives a warning and green will indicate a signal presence. An LED will be blank when no error or warning is present and to help convey routing information.



SW221 3G Statesman Status menu

The status group box shows video format information for both inputs. Should an input be missing or unrecognised by the SW221 3G the format will be given as invalid and the input as Not known.

The switch group box allows the configuration of the switching criteria and routing.

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

Switch

The switch pane is divided into several sections – Output Switch Timing, Switch Mode, Switch Back Delay, Valid Signal Format, GPI control and Factory Default.



SW221 3G Switch menu

Switch controls

The switching mode is configured by adding a check mark to the appropriate switch panel radio button.

In Immediate mode SW221 3G will act immediately on any error conditions that meet the switching criteria. An immediate switch will be an untimed crash switch and will likely cause a picture disturbance. An immediate switch would normally result when an input is lost due to the loss of timing from that input loss.

Other selections are Field and Frame. Selecting either of these under non-catastrophic error conditions will allow the SW221 3G to switch away from the main input in a more tidy manner, assuming the two inputs are co-timed.

Once SW221 3G has switched away from the faulty input, setting the switch back to Immediate mode will allow it to return once the error has disappeared for a minimum of one frame. In certain circumstances this could result in the output flip-flopping between the main program input and aux/standby input erratically. To avoid this, the switching action can be either delayed or latched so that, once switched, the output will remain in the switched state until a timing period has expired (set by the Switch Back Delay timer control or reset). Should the faulty input become error-free again SW221 3G will then automatically switch away from the secondary input unless in the latched condition. If the switch mode is set to 'latched' the output will remain showing the secondary input until the routing configuration is returned to its original state. In the latched condition an error on the secondary input would also cause the SW221 3G to auto switch assuming that first input is once again error free.

Valid Signal Control

The SW221 3G can be configured to switch if a different input standard appears on its input. Once the valid signal format has been selected by the user, any other standard present on an input will trigger an automatic switch to the other input.

Setting delay

The slider labelled Switch Back Delay may be adjusted to obtain a delay between 2 and 60 seconds. This delay sets the time interval from the removal of a video signal error on an input to when the SW221 3G switches back to that input. This function will only work if the SW221 3G is set to automatic switching and the switch mode is set to delay.

The variable assigned is always shown in the top line of the slider display. It is not possible to assign a delay beyond the range indicated by the slider. If a value less than the minimum or greater than the maximum is assigned, the slider will automatically jump to the minimum or maximum value.

The delay controls may be set in several different ways. The slide can be clicked and dragged, the numerical display may be edited directly, or a click on a position on the scale will cause the slider to jump to the value of the position clicked.

GPI configuration

The GPI inputs can be used to control input selection/routing are configurable for either edge or level triggered. They can also be used to give a tally of the selection/routing. When GPI control is selected to 'level' GPI = High (floating) selects Input 1 and GPI = Low (pulled to ground) selects Input 2.

Output A and output B both have individual GPI controls/tally's and can be selected to perform the following functions.

Output A	Output B
No GPI control. Tally on 'b'	No GPI control. Tally on 'd'
Level on 'a'. Tally on 'b'	Level on 'c'. Tally on 'd'
Edge on 'a'. Tally on 'b'	Edge on 'c'. Tally on 'd'
Edge on 'a' and 'b'. Tally on 'a' and 'b'	Edge on 'c' and 'd'. Tally on 'c' and 'd'
Edge on 'a' and 'b'. No tally	Edge on 'c' and 'd'. No tally

Factory Defaults

Factory defaults will return all parameters to their factory values.

Parameter	Default value
Auto switch Output A	No
Auto switch Output B	No
Routing Output A	Input 1
Routing Output B	Input 1
Output switch timing	Field
Switch mode	Immediately
Valid signal format	All
Switch back delay	2.0
GPI control Output A	No GPI control. Tally on "b"
GPI control Output B	No GPI control. Tally on "d"

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	
IN1 OP1	Yellow	Output 1 showing input 1	
IN2 OP1	Yellow	Output 1 showing input 2	
IN1 OP2	Yellow	Output 2 showing input 1	
IN2 OP2	Yellow	Output 2 showing input 2	

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	HD or SD SDI 270Mb/s to 2.970Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M SMPTE-424M Cable equalisation, 3G (2.970Gb/s) – 80 metres, Belden 1694 or equivalent HD (1.485Gb/s) – 140 metres, Belden 1694 or equivalent SD (270Mb/s) >250 metres, Belden 8281 or equivalent
Video standards supported	1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, 525.

Outputs

Number and type:	Three (2off Output 1 and 1off Output 2) HD or SD SDI 270Mb/s to 2.970Gb/s serial digital compliant to SMPTE-259M, SMPTE-292M and SMPTE-424M
Jitter	Meets the above SMPTE Specs

Processing

Video	Monitoring for loss of sync word on both Input 1 and Input 2
GPIs	Four GPI inputs configurable for input selection/routing Two GPI outputs showing input presence

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