SW803 3G

3G/HD/SD 8 x 3 crosspoint routing switch

Crystal Vision

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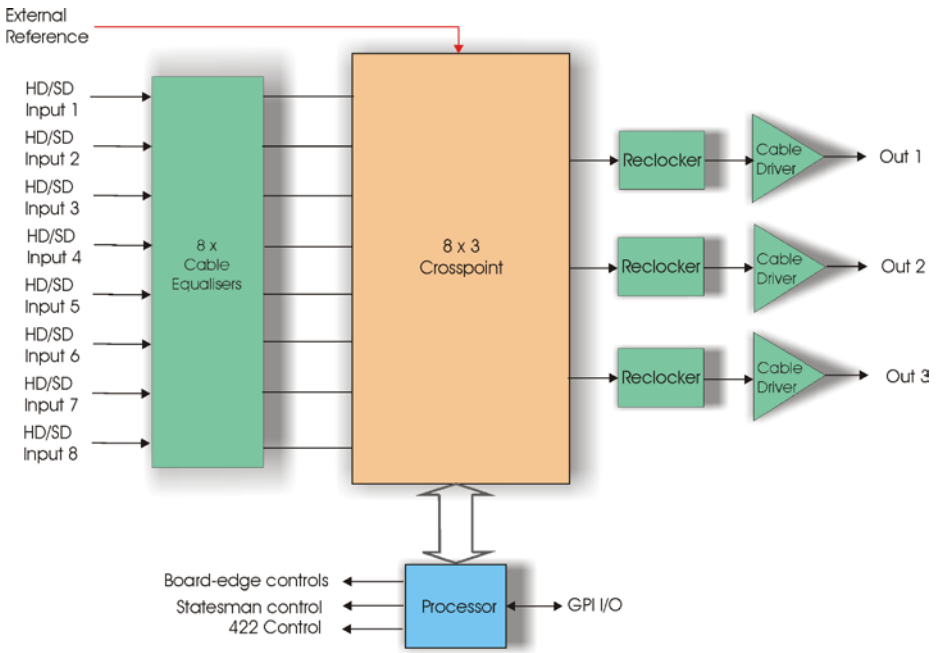
Revision 1.	Number of presets clarified.	05-02-10
Revision 2.	External reference information clarified. Pages 3 & 5.	30-06-11
Revision 3.	RM50 rear module view updated.	09-08-12
Revision 4.	Preset recall table amended, page 6.	16-04-13

1 Introduction

The SW803 3G is a 3G/HD/SD 8 x 3 crosspoint routing switcher.

Switch synchronisation is provided by either obtaining timing information from a selected SDI input or external analogue references, allowing the SW803 3G to switch in the vertical blanking interval so avoiding picture disturbance.

There is also provision to switch immediately for cases where there is no common reference although this is likely to result in a brief picture disturbance.



Individual switches can be set and multiple switch salvos can be created to change a number of crosspoint switches simultaneously. Up to 15 macros or custom routing table assignments may be stored and recalled, and up to 15 snapshots of the router table may be captured as presets for later recall.

Control is available from the SW808 Controller panel, Statesman PC control Software, an active control panel or the card edge. Names may be assigned to inputs and outputs from Statesman and active control panels.

The main features are as follows:

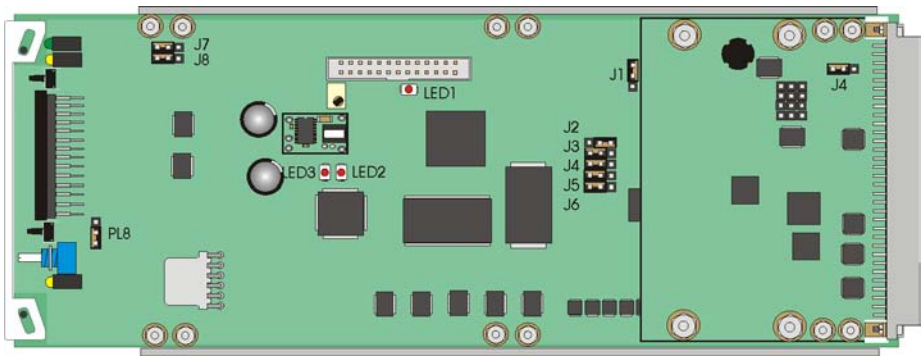
- 3G/HD/SD 8 x 3 routing switch
- Timed switching from either an SDI input or external analogue reference
- Salvos, macros and router ‘snapshot’ presets
- Names may be assigned to inputs and outputs
- GPI selection of macros and presets
- Control and status monitoring via dedicated controller, Statesman, frame/remote control panels or the card edge

2 Hardware installation

The SW803 3G double height module is used with a pair of RM50 rear connectors, which will fit into all Crystal Vision rack frames. All modules can be connected or removed while the frame is powered, without damaging the board.

The SW803 3G control lines can be configured for either GPI control or serial control from a SW808 button panel. Jumper links determine which control interface is enabled.

2.1 Module configuration



Link positions ↔

SW803 3G

Link configuration and LEDs

There are 13 jumper links and three surface-mounted LEDs on the SW803 3G. The surface-mounted LEDs are not visible from the front of the frame and are included for diagnostic purposes only.

Lower PCB	Comments
J3-6	GPI control ← 422 comms →
J1	No function
J2	Leave in position →
J7 J8	Spare (leave set to front ←)
PL8	↑ (User selected IP address). ↓ (Forced IP address 10-0-0-201)
LED1	CPU configuration in progress
LED2	Ethernet Data
LED3	Ethernet Link
Upper PCB	
J4	External reference input termination. ← (75R), → (Hi Z)

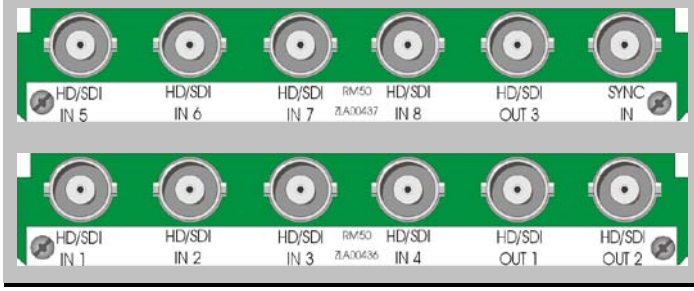
2.2 Rear modules and signal I/O

The 4U Indigo 4 frame will house up to 12 double height modules with up to three power supplies. The 2U Indigo 2 frames will house up to six double height modules and dual power supplies. The 1U Indigo 1 frames will house three double height modules and a single power supply. The Indigo DT desktop box has a built-in power supply and will house one double height module.

The rear modules used by the SW803 3G are an RM50 in both upper and lower positions.

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

Rear module connections with RM50

RM50 fits in all frames	Description
	**RM50** • 12 SW803 3G modules per Indigo 4 frame • Six per Indigo 2 frame • Three per Indigo 1 frame • One per Indigo DT • Slots 1-2, 3-4, 5-6, 7-8,9-10, 11-12, 13-14, 15-16, 17-18, 19-20, 21-22 and 23-24 used.

Upper BNCs	I/O assignment
HD/SDI IN 5	Serial Digital Input 5
HD/SDI IN 6	Serial Digital Input 6
HD/SDI IN 7	Serial Digital Input 7
HD/SDI IN 8	Serial Digital Input 8
HD/SDI OUT 3	Reclocked SDI output 3
SYNC IN	External reference input

Lower BNCs	I/O assignment
HD/SDI IN 1	Serial Digital Input 1
HD/SDI IN 2	Serial Digital Input 2
HD/SDI IN 3	Serial Digital Input 3
HD/SDI IN 4	Serial Digital Input 4
HD/SDI OUT 1	Reclocked SDI output 1
HD/SDI OUT 2	Reclocked SDI output 2

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 connections are available on the lower board’s remote connectors.

The following table shows the binary weighted code required to recall presets or macros 1 to 15 according to the state of GPI ‘e’. A ‘H’ is an open GPI input and a ‘L’ is a grounded GPI input.

Recall Preset	No change	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
GPI ‘a’	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
GPI ‘b’	H	H	L	L	H	H	L	L	H	H	L	L	H	H	L	L
GPI ‘c’	H	H	H	H	L	L	L	L	H	H	H	H	L	L	L	L
GPI ‘d’	H	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L

	OPEN (+5V)	GROUND
‘a’, ‘b’, ‘c’, ‘d’	See table above	
‘e’	Selects Stored Presets	Selects stored Macros
‘f’	Reference source selected	No valid signal on selected source

GPI input assignment

GPI input connections have 10k Ω pull-up resistors to +5V. Closed-contact switches or +5V to +24V logic levels can be used.

GPI output connections have 330Ω series resistors fitted to drive LEDs and 10k Ω pull-up to +5V (to drive a remote input).

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							
2		7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3							
4		7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5							
6	Upper	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7							
8		4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9							
10		10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11							
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							
2		7 (5)	16 (5)	17 (5)	25 (5)	10 (6)	11 (6)
3							
4		7 (7)	16 (7)	17 (7)	25 (7)	10 (8)	11 (8)
5	Lower						
6		4 (5)	14 (5)	13 (5)	23 (5)	3 (6)	4 (6)
7							
8		4 (7)	14 (7)	13 (7)	23 (7)	3 (8)	4 (8)
9							
10		10 (5)	11 (5)	19 (5)	20 (5)	21 (6)	22 (6)
11							
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.

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						
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3						
4	7 (3)	16 (3)	17 (3)	25 (3)	10 (4)	11 (4)
5						
6	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
7						
8	4 (3)	14 (3)	13 (3)	23 (3)	3 (4)	4 (4)
9						
10	10 (1)	11 (1)	19 (1)	20 (1)	21 (2)	22 (2)
11						
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.

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						
2	7 (1)	16 (1)	17 (1)	25 (1)	10 (2)	11 (2)
3						
4	4 (1)	14 (1)	13 (1)	23 (1)	3 (2)	4 (2)
5						
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.

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						
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.

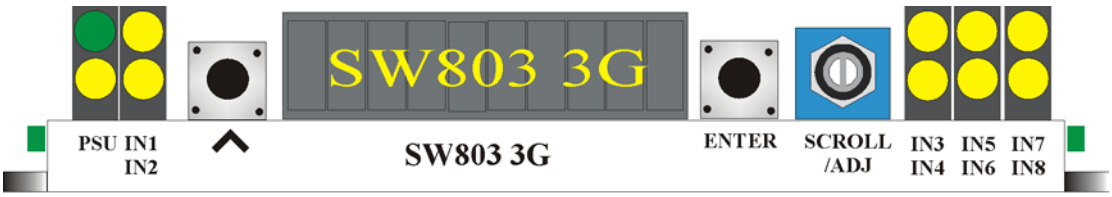
Remote 2: 26-way high-density D-Type male plugs and frame ground is pin 6 and +5V @500mA is pin 15.

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



SW803 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

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.

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
IN 1	Yellow	Input 1 present	Input 1 not present
IN 2	Yellow	Input 2 present	Input 2 not present
PSU	Green	Good power supply (PSU) rails	One or more of the monitor supplies is out of specification
	Yellow	Not currently supported	
IN3	Yellow	Input 3 present	Input 3 not present
IN4	Yellow	Input 4 present	Input 4 not present
IN5	Yellow	Input 5 present	Input 5 not present
IN6	Yellow	Input 6 present	Input 6 not present
IN7	Yellow	Input 7 present	Input 7 not present
IN8	Yellow	Input 8 present	Input 8 not present

3.3 Navigating card edge menus

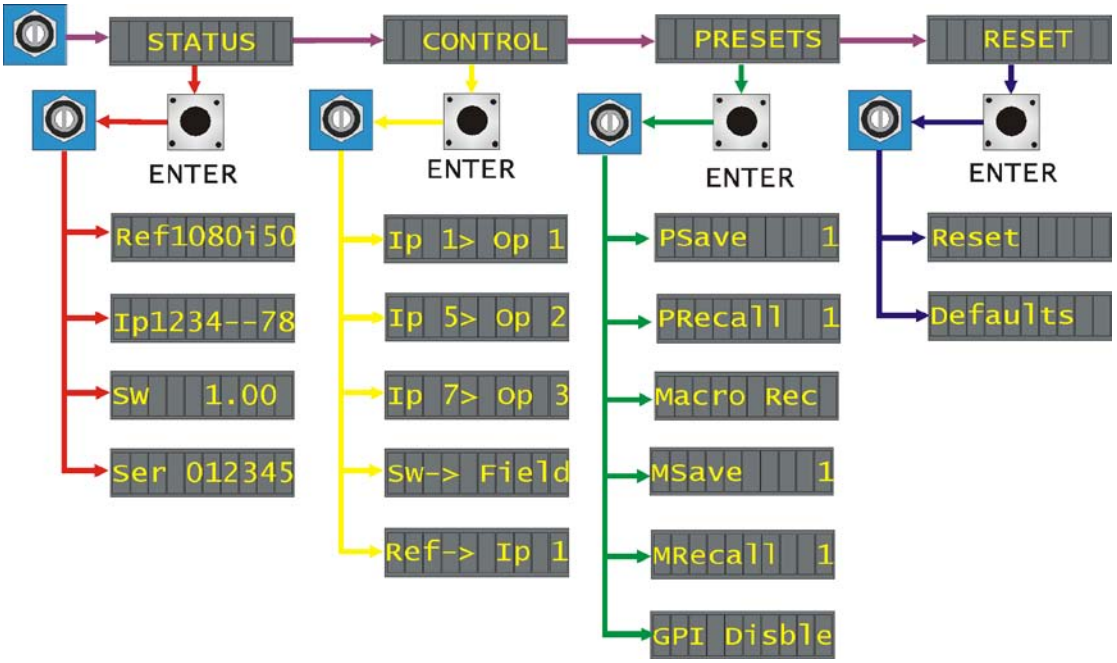
To access the card edge menu system proceed as follows:

- 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

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

3.4 Card edge configuration

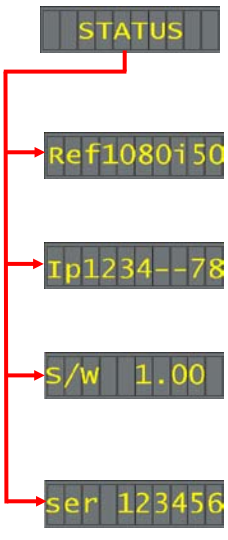
Menu tree



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

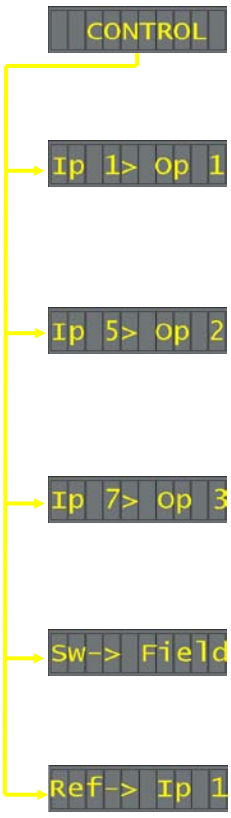
From the Status top menu press ENTER then SCROLL to access the Status menu list.



Menu	Comment
Reference video standard	The Reference video standard is shown. ***1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, 525, Unknown.***
Input s present	The video inputs present are shown. ***12345678 (-)*** missing.
Software version installed	The version number of the currently installed software.
Electronically store serial number	The electronically stored PCB serial number. This should correspond with the serial number label affixed to the PCB connector.

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.



Menu	Comment
Output 1 routing	Rotate the Scroll/Adj. control to show Output 1 routing. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select immediately or press [^] leave routing unselected. ***Ip 1, Ip 2, Ip3, Ip 4, Ip 5, Ip 6, Ip 7, Ip 8.***
Output 2 routing	Rotate the Scroll/Adj. control to show Output 1 routing. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select immediately or press [^] leave routing unselected. ***Ip 1, Ip 2, Ip3, Ip 4, Ip 5, Ip 6, Ip 7, Ip 8.***
Output 3 routing	Rotate the Scroll/Adj. control to show Output 1 routing. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select immediately or press [^] leave routing unselected. ***Ip 1, Ip 2, Ip3, Ip 4, Ip 5, Ip 6, Ip 7, Ip 8.***
Output switch timing	Rotate the Scroll/Adj. control to show Output switch timing selection. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. ***Field, Frame, Immediate.***
Reference source selection	Rotate the Scroll/Adj. control to show the reference source selection. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. ***Input 1, Input 2, Input 3, Input 4, External, Unknown.***

Routing

The board edge routing controls allow both immediate routing of a selected single input to a selected output, and multiple routing in the manner of a salvo.

Example;

If output 1 routing is selected with input 5 as its source pressing ENTER will result in an immediate switch, taking into consideration the output switch timing setting.

If instead of pressing ENTER the up arrow [^] is pressed the new routing will be retained but not implemented. The user is now able to go to one of the other output routing menus where a further routing selection can be made. Pressing ENTER will now implement the new routing plus the output 1 routing simultaneously. It would also be possible to again press the up arrow [^] and make a third routing selection at which point all three routings will be implemented on pressing the ENTER button.

Output Switch timing

From this menu it is possible to set the output switching conditions from the selection of Field, Frame or Immediate (crash). The timed switching points are in accordance with RP168-2002 for all supported standards.

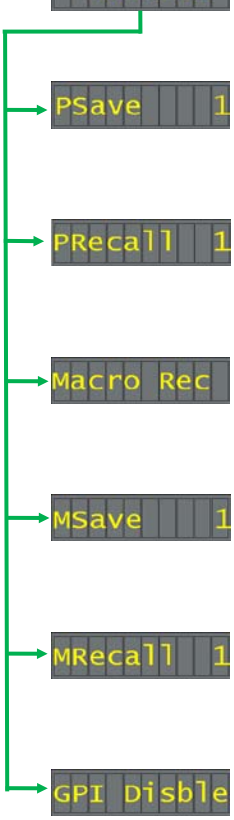
When timed switching is selected, and should the chosen reference source be removed the switching mode will automatically change to immediate. It will be necessary to reselect the switching mode manually once the reference source has returned.

Reference source

SW803 3G can obtain its timing source reference either from inputs 1 to 4 or take an external analogue reference being either black and burst or tri-level syncs. The Status menu will report the reference video standard unless the source is removed in which case an 'Unknown' status will be reported.

3.5 Presets menu

From the Status top menu rotate SCROLL to display the Presets menu. Press ENTER to enter the Presets 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.



Menu	Comment
Save presets	Rotate the Scroll/Adj. control to show Preset save location. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to save. ***1-15.***
Recall presets	Rotate the Scroll/Adj. control to show Preset location to recall. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to recall. ***1-15.***
Macro record	Rotate the Scroll/Adj. control to show Macro record. Press ENTER to set the start point. Press the up arrow [⋀] and make the required routing selections and follow by a Macro save.
Save Macro	Rotate the Scroll/Adj. control to show Save Macro. Press ENTER and rotate Scroll/Adj. to select location. Press ENTER to select. ***1-15.***
Recall Macro	Rotate the Scroll/Adj. control to show Recall Macro. Press ENTER and rotate Scroll/Adj. to select location. Press ENTER to select. ***1-15.***
GPI Enable	Rotate the Scroll/Adj. control to show GPI Enable. Press ENTER and rotate Scroll/Adj. to select. Press ENTER to select. ***Enable, Disable.***

Saving and recalling presets

Unlike a macro, a preset is a snapshot of the state of every crosspoint. Up to fifteen presets can be saved and recalled at any time.

To save a snapshot of all crosspoint assignments as a preset enter the Save Presets menu and select the desired location 1-15 and press the ENTER button to assign that location. Press ENTER a second time to action the save. A successful save will be indicated by the word 'Done' appearing on the display.

Note: Any previously saved crosspoint assignment in a location will be overwritten by the new configuration.

To recall a preset enter the Recall Presets menu and select the desired location 1-15. Press the ENTER button to select that location. Press ENTER a second time to action the recall. A successful recall will be indicated by the word 'Done' appearing on the display.

Tip: If necessary view the routing table to confirm that the required connections have been set.

Saving and recalling macros

A macro is a batch of crosspoint assignments, which are changed together and unlike a preset will only affect that batch of crosspoints, any crosspoints outside of the batch will remain unaffected when the macro is recalled.

To build a macro select the Macro Record menu and press the ENTER button. This will cause the Macro Record text to change from normal text to an italic font. Press the up arrow [^] and navigate to the routing menus where the desired assignment can be made. Navigate to the Macro Save menu and select a location where the macro is to be saved. Save the macro.

To recall a macro enter the Recall Macro menu and select the desired location 1-15. Press the ENTER button to select that location. Press ENTER a second time to action the recall. A successful recall will be indicated by the word 'Done' appearing on the display.

Tip: If necessary view the routing table to confirm that the required connections have been set.

Note: When reassigning routing, it is not necessary to disturb the existing routing. This is achieved by leaving the new routing unasserted. See Routing.

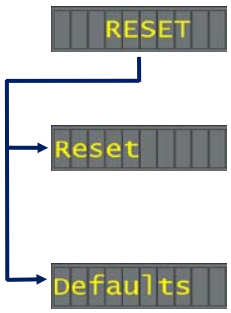
GPI control

The SW803 3G may be controlled via GPI lines connected to the rear of the frame in which the module is used. GPI control is limited to recalling stored presets or macros. GPI control cannot be used at the same time as the SW808 Controller panel as both use the same physical control lines. Please refer to the Installation chapter for more information on using GPIs.

To enable GPI control select GPI control Enable.

Recalling factory default settings (Reset)

From the Reset top menu press ENTER then SCROLL to display the Reset menu.



Menu	Comment
Reset	Press ENTER to access Reset menu. Rotate the Scroll/Adj control to select Yes, press ENTER to action reset. Display will confirm reset done.
Default	Press ENTER to access Defaults menu. Rotate the Scroll/Adj control to select Yes, press ENTER to action reset. Display will confirm reset done.

Note: Factory reset will erase all saved preset and macro configurations. To preserve contents of the preset and macro locations use the Defaults command.

Parameter	Default value
Routing	Input 1 to Output 1, Input 2 to Output 2, Input 3 to Output 3
Switch Synchronisation	Field
Reference	Input 1
Presets	Erased (factory reset only)
Macros	Erased (factory reset only)
GPI Enable	Not enabled

4 Using the front control panel

4.1 Module selected

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

Note: It is **ESSENTIAL** that the panel setup procedure is followed and any old or unknown passwords cleared prior to using the panel for the first time.

At power up all eight control panel keys LEDs will illuminate briefly. Once the panel has completed its power up and configuration sequence the panel will enter Statesman mode and the massage '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 Setup, Lock Panel and Diagnostic menus.

Selecting a SW803 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 SW803 3G has been selected.

The SW803 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 SW803 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 SW803 3G are obtained by pressing the F1- F4 keys from the Home menu. Menu keys are illuminated when active and when further menus are available.

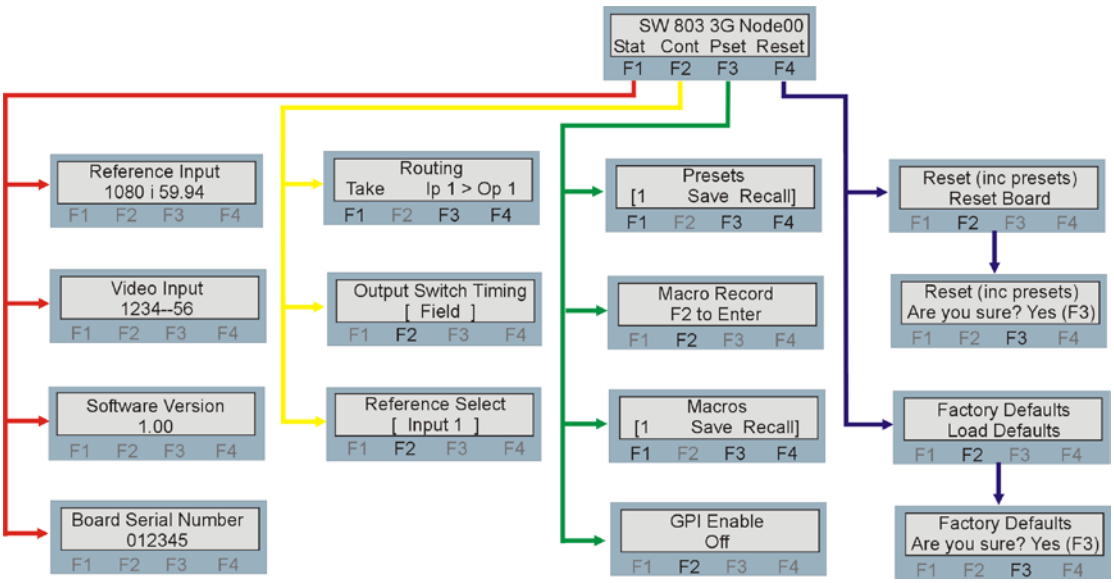
The top-level menus are:

- Status – Press F1
- Control (Routing, Switch sync and Reference source) – Press F2
- Presets (Preset and Macro call/recall) – Press F3
- Reset – Press F4

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 SW803 3G menus. The actual menus available may vary slightly as software is updated.

Active control panel menus

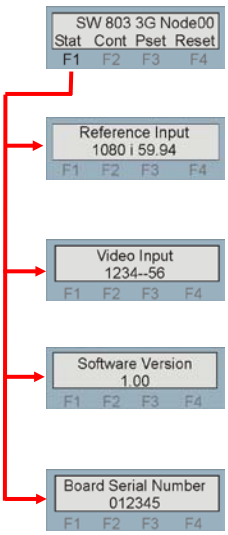


Note: Function key LEDs are illuminated when active.

The Status menu

Pressing button F1 from the Home menu will enter the Status menu. This menu is traversed by rotating the shaft control. The following table lists in order the available sub menus.
No changes can be made from this menu as it is read only.

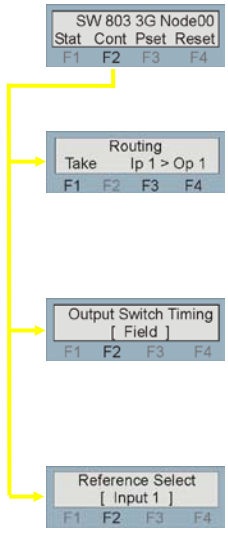
Note: Not all status information will be updated in real time. If necessary press the * button to update the display information.



Menu	Comment
Reference Input video standard	Rotate the shaft control to view the reference input video standard. ***1080p 50/59.94/60, 1080i 50/59.94/60, 720p 50/59.94/60, 625, NTSC, Unknown.***
Video Inputs Present	Rotate the shaft control to view the video inputs present. ***12345678 (-)*** missing.
Input 1 audio groups present	Rotate the shaft control to view the version number of the currently installed software.
Input 2 audio groups present	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.

The Control menu

Pressing button F2 from the Home menu will enter the Control menu. From this menu the routing, switch timing selection and reference source are selected. All settings are made using the function buttons and shaft control.



Menu	Comment
Routing	Rotate the shaft control to view the Routing menu. Press F3 and rotate the shaft control to select the source. Press F4 and rotate the shaft control to select the output. Press F1 to assign the routing selection.
Output switch timing	Rotate the shaft control to view the switch timing selection. Press F2 and rotate shaft control to make the selection. Press Enter to select. ***Field, Frame, Immediate.***
Reference source selection	Rotate the shaft control to view the reference source selection. Press F2 and rotate shaft control to make the selection. Press Enter to select. ***Input 1, Input 2, Input 3, Input 4, External, Unknown.***

Routing

The active control panel routing controls allow both immediate routing of a selected single input to a selected output, and multiple routing in the manner of a salvo.

Example; If output 1 routing is selected with input 5 as its source, pressing Take will result in an immediate switch, taking into consideration the output switch timing setting.

If, instead of pressing Take the up arrow [⋀] is pressed, the new routing will be retained but not implemented. The user is now able to go to one of the other output routing menus where a further routing selection can be made. Pressing ENTER will now implement the new routing plus the output 1 routing simultaneously. It would also be possible to again press the up arrow [⋀] and make a third routing selection at which point all three routings will be implemented on pressing the ENTER button.

Output switch timing

From this menu it is possible to set the output switching criteria from the selection of Field, Frame or immediate (crash). The timed switching points are in accordance with RP168-2002 for all supported standards.

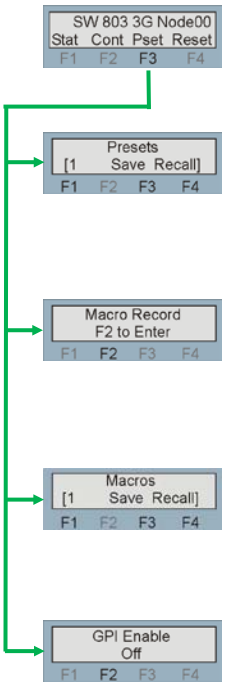
When timed switching is selected, and should the chosen reference source be removed the switching mode will automatically change to immediate. It will be necessary to reselect the switching mode manually once the reference source has returned.

Reference source

SW803 3G can obtain its timing source reference either from inputs 1 to 4 or take an external analogue reference being either black and burst or tri-level syncs. The video reference is reported unless the source is removed in which case an ‘Unknown’ status will be reported.

The Presets menu

From the Home press F3 to display the Presets menu and rotate shaft control to show the available options.



Menu	Comment
Save and recall presets	Rotate the shaft control to view the Presets menu and press F2 Press F1 and rotate the shaft control to select location number. Press F3 to save the board configuration to the selected location. Press F4 to recall the saved configuration from the selected location.
Macro Record	Rotate the shaft control to view the Macro Record menu. Press F2 to enter and press F3 to set the start point. Press the up arrow [^] and make the required routing selections and follow by a Macro Save**.**
Save and record Macros	Rotate the shaft control to view the Macros menu and press F2 Press F1 and rotate the shaft control to select location number. Press F3 to save the macro to the selected location. Press F4 to recall the saved macro from the selected location.
GPI Enable	Rotate the shaft control to view the GPI Enable menu. Press F2 to select. ***On, Off.***

Saving and recalling presets

Unlike a macro, a preset is a snapshot of the state of every crosspoint. Up to fifteen presets can be saved and recalled at any time.

To save a snapshot of all crosspoint assignments as a preset press F2 to enter the Save Presets menu, press F1 and rotate the shaft control to select the desired location 1-15. Press F3 to save the current board configuration to the selected location.

Note: Any previously saved crosspoint assignment in a location will be overwritten by the new configuration.

To recall a preset again select the location of the preset you wish to recall and press F4 to recall the stored board configuration.

Tip: If necessary view the routing table to confirm that the required connections have been set.

Saving and recalling macros

A macro is a batch of crosspoint assignments, which are changed together and unlike a preset will only affect that batch of crosspoints, any crosspoints outside of the batch will remain unaffected when the macro is recalled.

To build a macro select the Macro Record menu and press the F2 button to enter. Press F3 to set the record point. Press the up arrow [^] and navigate to the routing menus where

the desired assignment can be made. Navigate to the Macro Save menu and select a location where the macro is to be saved. Save the macro.

To recall a macro enter the Recall Macro menu and select the desired location 1-15. Press the F4 button to action the recall.

Tip: If necessary view the routing table to confirm that the required connections have been set.

Note: When reassigning routing, it is not necessary to disturb the existing routing. This is achieved by leaving the new routing unasserted. See Routing.

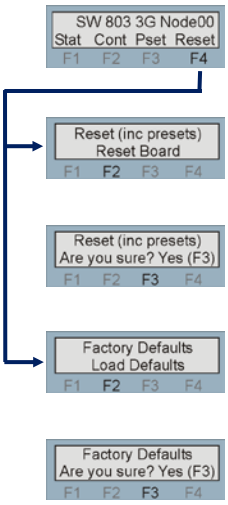
GPI control

The SW803 3G may be controlled via GPI lines connected to the rear of the frame in which the module is used. GPI control is limited to recalling stored presets or macros. GPI control cannot be used at the same time as the SW808 Controller panel as both use the same physical control lines. Please refer to the Installation chapter for more information on using GPIs.

To enable GPI control select GPI Enable and set to ON.

The Reset menu

Pressing button F4 from the Home menu will enter the Reset menu.



Menu	Comment
Factory Reset	Rotate the shaft control to view the Reset menu. Press F2 to select Reset Press F3 to action reset
Factory Defaults	Rotate the shaft control to view the Default menu. Press F2 to select Load defaults Press F3 to action.

Note: Factory reset will erase all saved preset and macro configurations. To preserve contents of the preset and macro locations use the Defaults command.

Parameter	Default value
Routing	Input 1 to Output 1, Input 2 to Output 2, Input 3 to Output 3
Switch Synchronisation	Field
Reference	Input 1
Presets	Erased (factory reset only)
Macros	Erased (factory reset only)
GPI Enable	Not enabled

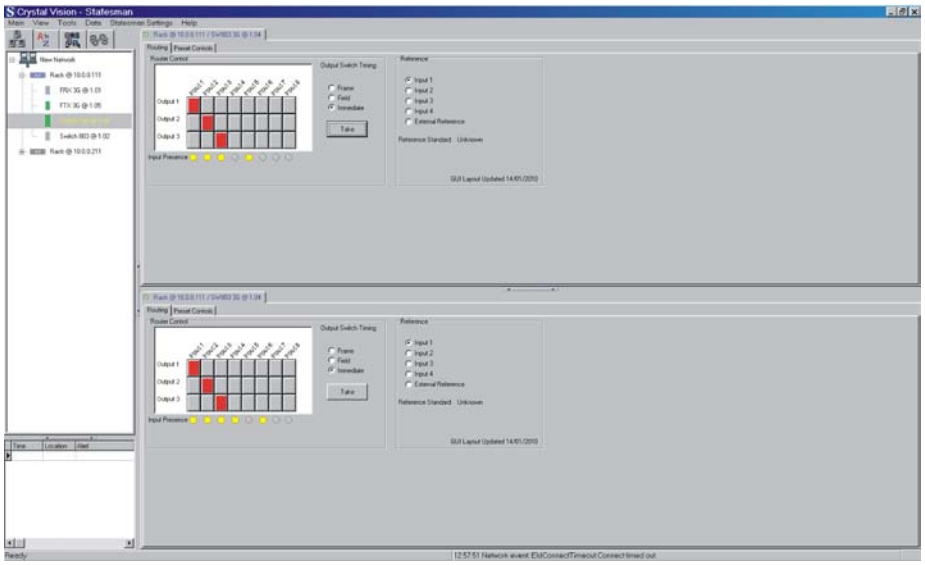
5 Statesman

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

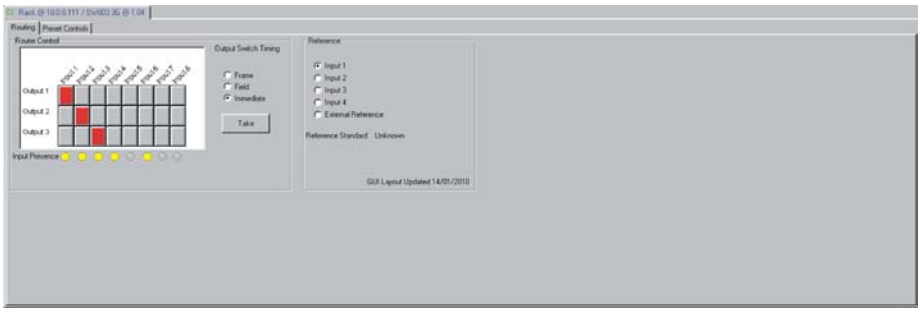
The menu display is repeated for convenience to allow dual-control display of modules with duplicate signal paths or to allow two functions to be viewed at the same time.

SW803 3G has two Statesman menu tabs, one that is used for routing and to provide status information, and the second that contains the preset and macro controls.

Routing

The routing pane is divided into two sections – Routing and switch synchronisation, and Output source.

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



SW803 3G's routing menu

Input status and routing control

The 8 x 3 Router Control provides the input/output assignment. Routing is assigned by pressing the button associated with the required input and output combination. On pressing the selected routing button the button will turn brown to highlight that it has been selected. Once all the required routing combinations have been entered press the Take button to assign the new routing.

The eight simulated input present LEDs show which inputs have a valid video signal connected to them.

Output switch timing

From this menu it is possible to set the output switching criteria from the selection of Field, Frame or Immediate (crash). The timed switching points are in accordance with RP168-2002 for all supported standards.

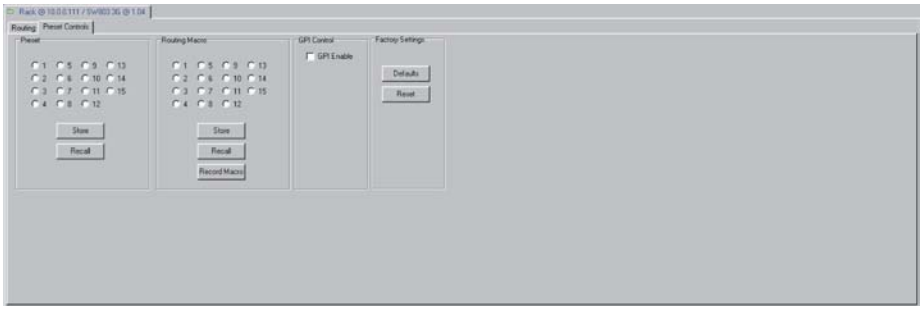
When timed switching is selected, and should the chosen reference source be removed the switching mode will automatically change to immediate. It will be necessary to reselect the switching mode manually once the reference source has returned.

Reference source

SW803 3G can obtain its timing source reference either from inputs 1 to 4, or take an external analogue reference being either black and burst or tri-level syncs. The video reference is reported unless the source is removed in which case an 'Unknown' status will be reported.

Preset controls

The Preset pane is where presets and macros can be saved and recalled. Factory reset and GPI control is also found here.



SW803 3G Preset Control menu

Saving and recalling presets

Unlike a macro, a preset is a snapshot of the state of every crosspoint. Up to fifteen presets can be saved and recalled at any time.

To save a snapshot of all crosspoint assignments as a preset select a location from the fifteen available and press the Store button.

Note: Any previously saved crosspoint assignment in a location will be overwritten by the new configuration.

To recall a preset again select the location of the preset you wish to recall and press the Recall button.

Tip: If necessary view the routing table to confirm that the required connections have been set.

Saving and recalling macros

A macro is a batch of crosspoint assignments, which are changed together and unlike a preset will only affect that batch of crosspoints, any crosspoints outside of the batch will remain unaffected when the macro is recalled.

To build a macro press the Macro Record button which will set the record point, make the desired routing assignments and save the macro to the chosen location by selecting the location and pressing Store.

To recall a macro select the desired location and press the Recall button to action the recall.

Tip: If necessary view the routing table to confirm that the required connections have been set.

GPI control

The SW803 3G may be controlled via GPI lines connected to the rear of the frame in which the module is used. GPI control is limited to recalling stored presets or macros. GPI control cannot be used at the same time as the SW808 Controller panel as both use the same physical control lines. Please refer to the Installation chapter for more information on using GPIs.

To enable GPI control, select GPI Enable.

Factory settings

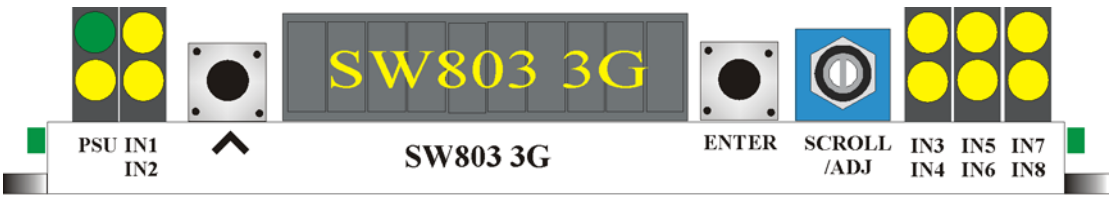
The SW803 3G can be either reset to its factory settings or defaults from this menu. Selecting factory reset will return all customer settable parameters to their default condition as listed in the following table. If the contents of either the presets or macro store need to be saved use the Defaults button in place of the Reset button.

Note: Factory reset will erase all saved preset and macro configurations. To preserve contents of the preset and macro locations use the Defaults command.

Parameter	Default value
Routing	Input 1 to Output 1, Input 2 to Output 2, Input 3 to Output 3
Switch Synchronisation	Field
Reference	Input 1
Presets	Erased (factory reset only)
Macros	Erased (factory reset only)
GPI Enable	Not enabled

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
IN 1	Yellow	Input 1 present	Input 1 not present
IN 2	Yellow	Input 2 present	Input 2 not present
PSU	Green	Good power supply (PSU) rails	One or more of the monitor supplies is out of specification
	Yellow	Not currently supported	
IN3	Yellow	Input 3 present	Input 3 not present
IN4	Yellow	Input 4 present	Input 4 not present
IN5	Yellow	Input 5 present	Input 5 not present
IN6	Yellow	Input 6 present	Input 6 not present
IN7	Yellow	Input 7 present	Input 7 not present
IN8	Yellow	Input 8 present	Input 8 not present

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

7 Specification

General

Dimensions	100mm x 266mm module with DIN 41612 connector
Weight	250g
Power consumption	14 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 1694A or equivalent HD (1.485Gb/s) – 140 metres, Belden 1694A 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, PAL, NTSC.

Outputs

Number and type	Three (2off main program and 1off aux/standby program) 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.

Status and monitoring

GPIs	One output alarm is available which is user configurable Five GPI inputs configurable for input selection/routing Card edge visual monitoring, with 10 digit dot matrix display and LED indicators to indicate: PSU rails present, inputs present and output routing

8 Appendix

8.1 The SW808 controller panel

The SW808 Controller panel is designed to control the SW808 or SW803 3G routing switch using an RS422 serial link. The controller has dedicated buttons for each of the eight sources and destinations together with a TAKE button and Salvo SAVE and RECALL buttons.

SW808 Controller panel

8.2 Installing the Controller

The SW803 3G has a number of external control lines that can be configured for GPI or RS422 control. These control lines MUST be configured for RS422 to enable SW808 Controller communication as explained in section 2.1. It is NOT possible to retain GPI control when the controller panel is enabled. However, the SW808 panel has its own GPI control built in as described later in this chapter.

The panel communicates with Crystal Vision frames via a serial communication link using the 422 BUS port at the rear of the panel. Standard UTP patch cables may be used with an appropriate adaptor for the Crystal Vision frame remote connector.

SW808 Controller panel – rear view

The RJ45 422 BUS port is next to the GPI I/O connector. Other RJ45 connectors and the four-way DIP switch are NOT used.

Each card slot in a frame has its control lines brought out to different 26-way D-type frame remote connectors on the rear of the frame. The following tables show which remote connectors to use for different frames and frame slots:

SW803 3G card slots and frame remote connectors

RJ45	Slot 2	Slot 4	Slot 6	Slot 8	Slot 10	Slot 12
Indigo 4U frame upper	Rem 1	Rem 3	Rem 1	Rem 3	Rem 1	Rem 3
Indigo 4U frame lower	Rem 4	Rem 7	Rem 4	Rem 7	Rem 4	Rem 7
Indigo 2U frame	Rem 1	Rem 3	Rem 1	Rem 3	Rem 1	Rem 3
Indigo 1U frame	Rem 1	Rem 1	Rem 1	N/A	N/A	N/A
Desk top box	Rem 1	N/A	N/A	N/A	N/A	N/A

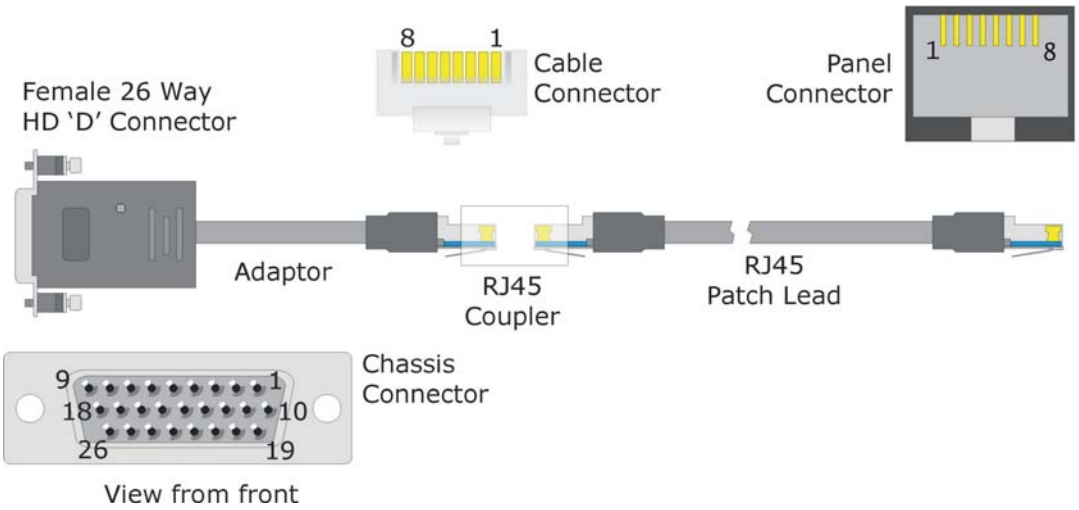
The appropriate remote connector(s) should be connected to the 422 Bus at the rear of the panel using an adaptor, as explained in the next section.

Note: The second serial port on the SW803 3G is used for controller communications allowing front panel and Statesman control at the same time as controller access.

Controller to frame remote wiring

The connection from the control panel to the appropriate frame remote connector has a cable with a D-type plug at one end and an RJ45 connector at the other.

It is suggested that a short adaptor cable be made with a standard RJ45 patch lead and an in-line coupler used to make the required overall cable length.



Controller panel to frame adaptor and CAT5 patch lead

The following tables show how the required panel to frame adaptors should be wired.

CAT5 Colour	RJ45 plug	S2/R1 S4/R3	S6/R1 S8/R3	S10/R1 S12/R3
	Shell (GND)	**6/Shell**	**6/Shell**	**6/Shell**
Brown	**8**	**7**	**4**	**10**
W/Brown	**7**	**16**	**14**	**11**
Blue	**4**	**17**	**13**	**19**
W/Blue	**5**	**25**	**23**	**20**

Twisted Pair

Twisted Pair

Indigo 4U upper frame remote 1

RJ45	Slot 2	Slot 6	Slot 10
Pin 8	Pin 7	Pin 4	Pin 10
Pin 7	Pin 16	Pin 14	Pin 11
Pin 4	Pin 17	Pin 13	Pin 19
Pin 5	Pin 25	Pin 23	Pin 20

Indigo 4U upper frame remote 3

RJ45	Slot 4	Slot 8	Slot 12
Pin 8	Pin 7	Pin 4	Pin 10
Pin 7	Pin 16	Pin 14	Pin 11
Pin 4	Pin 17	Pin 13	Pin 19
Pin 5	Pin 25	Pin 23	Pin 20

Indigo 4U lower frame remote 4

RJ45	Slot 2	Slot 6	Slot 10
Pin 8	Pin 7	Pin 4	Pin 10
Pin 7	Pin 16	Pin 14	Pin 11
Pin 4	Pin 17	Pin 13	Pin 19
Pin 5	Pin 25	Pin 23	Pin 20

Indigo 4U lower frame remote 7

RJ45	Slot 4	Slot 8	Slot 12
Pin 8	Pin 7	Pin 4	Pin 10
Pin 7	Pin 16	Pin 14	Pin 11
Pin 4	Pin 17	Pin 13	Pin 19
Pin 5	Pin 25	Pin 23	Pin 20

Indigo 2U frame remote 1

RJ45	Slot 2	Slot 6	Slot 10
Pin 8	Pin 7	Pin 4	Pin 10
Pin 7	Pin 16	Pin 14	Pin 11
Pin 4	Pin 17	Pin 13	Pin 19
Pin 5	Pin 25	Pin 23	Pin 20

Indigo 2U frame remote 3

RJ45	Slot 4	Slot 8	Slot 12
Pin 8	Pin 7	Pin 4	Pin 10
Pin 7	Pin 16	Pin 14	Pin 11
Pin 4	Pin 17	Pin 13	Pin 19
Pin 5	Pin 25	Pin 23	Pin 20

Indigo 1U frame remote 1

RJ45	Slot 2	Slot 4	Slot 6
Pin 8	Pin 7	Pin 4	Pin 10
Pin 7	Pin 16	Pin 14	Pin 11
Pin 4	Pin 17	Pin 13	Pin 19
Pin 5	Pin 25	Pin 23	Pin 20

Desk top box remote 1

RJ45	Slot 1	Slot 2
Pin 8	Pin 8	Pin 7
Pin 7	Pin 9	Pin 16
Pin 4	Pin 18	Pin 17
Pin 5	Pin 26	Pin 25

Note: The RJ45 connector at the rear of Indigo frames should not be used to connect controller panels.
For the panel to work jumper links PL9-PL12 need to be fitted towards the rear of the board as explained in section 2.1 This will disable GPI control of the SW803 3G module, but controller GPIs will be available.

Using controller GPIs

The controller GPIs are provided to allow remote control of the first two destinations with optional tally outputs.

There are 18 GPI lines, which can be configured as inputs or outputs. When used as inputs they control source selection for destinations 1 and 2. They may also be used as tallies when configured as outputs.

GPIs 1 – 8 control destination 1 and are enabled by GPI 17.

GPIs 9 – 16 control destination 2 and are enabled by GPI 18.

With GPIs 1 – 8 enabled, selecting GPI 1 will set destination 1 to source 1, pressing GPI 2 will set destination 1 to source 2 etc. The same applies for destination 2 with GPIs 9 – 16.

The GPIs will also give a tally output so that when destination 1 is connected to source 4, GPI 4 will be low. This tally will follow destinations 1 and 2, no matter where the routing is updated from.

The pinout for the 26 way ‘D’ connector at the rear of the SW808 Controller panel is as follows:

26-way D-type pin connections

Pin No.	Description	Pin No.	Description	Pin No.	Description
1	+5V	10	GPI_6	19	GPI_14
2	0V	11	GPI_7	20	GPI_15
3	GPI_1	12	GPI_8	21	GPI_16
4	GPI_2	13	GPI_9	22	GPI_17
5	0V	14	0V	23	GPI_18
6	GPI_3	15	GPI_10	24	GPI_19
7	GPI_4	16	GPI_11	25	GPI_20
8	GPI_5	17	GPI_12	26	0V
9	+5V	18	GPI_13		

Note: GPIs 19 and 20 are currently unassigned.

8.3 SW808 Controller operation

To use the SW808 Controller, proceed as follows:

- Connect the SW808 Controller panel to a Crystal Vision frame with an SW803 3G module installed as explained in the previous section
- Power the Controller panel - the panel will automatically search for an SW803 3G module

SW808 Controller panel

Searching Mode

The panel indicates that it is in 'searching mode' by flashing the source and destination buttons and LEDs in a back and forth pattern. Button presses will have no effect whilst searching.

The panel will remain in 'searching mode' until it has established communications with a SW803 3G board. If communication with a SW803 3G is lost, it will return to 'searching mode'.

Panel LED	Meaning when lit	Comment
Ref	Reference present.	Composite/SDI reference selection cannot be made from the panel
Comms	Comms OK	Illuminates to indicate communication with SW803 3G
Panel lock	Panel locked	All buttons are locked out. To toggle panel lock on and off hold down source 1 button and destination 8 button for approximately 3 seconds
Input present	Shows which paths have signals	The eight LEDs under the source buttons show video in to the SW803 3G, and the eight LEDs under the destination buttons show video out of the SW803 3G and are therefore routing dependent

Changing crosspoint assignments

To change routing, first press the destination button and then the new source button. The new source button will flash and the TAKE button will light. Then press the TAKE button and the new routing will be updated on the SW803 3G. Where the output selection remains unchanged any source may be selected and routed to that output by simply selecting the source and pressing TAKE.

Tip: Always assign sources to destinations by first selecting a destination followed by a source to route to that destination.

To undo routing that hasn't been 'taken' press the destination and then the original source. This will be the source button that is lit and not flashing.

Viewing crosspoint assignments

To see which source is connected to which destination, press the DESTINATION button and the source connected to it will light. One source can go to more than one destination.

Multiple routing

Multiple routing can be performed by creating the required destination-source pairs before pressing the TAKE button. The destination buttons will flash to show that they have routing waiting for a take. To confirm the routing press the TAKE button and the selected routing assignments will all be updated simultaneously.

This is similar to establishing a single crosspoint except that instead of pressing TAKE immediately, further destination-source pairs are created first.

Note: The last destination button pressed does not flash.

Setting up multiple routing:

- Press the destination and then the source for each crosspoint assignment required in turn – destination buttons flash
- Press TAKE to confirm the routing

Using macros

Up to sixteen macros may be recorded and stored and recalled from the SW803 3G, Statesman, and card edge control or by external GPIs. Unlike presets, salvos do not store board setup data, switching mode or reference selection.

Macros can be created from the controller panel; by setting up multiple routing and pressing SAVE instead of TAKE. All the source and destination buttons will flash to indicate that a memory location needs to be selected. The source buttons 1 – 8 represent macros 1 – 8, and the destination buttons represent macros 9 – 15. Select a memory location and then press SAVE to confirm.

Creating a macro:

- Set up the required routing
- Press SAVE – all source and destination buttons flash
- Choose a source/destination button for the salvo - SAVE will flash
- Press SAVE to confirm the choice

To recall a macro press RECALL, select a memory location and then press RECALL again to confirm, or any other button to cancel.

Recalling a macro:

- Press RECALL – all source and destination buttons flash
- Choose a source/destination button with a previously saved macro - RECALL will flash
- Press RECALL to confirm the choice

Notes: When recalling macros only those crosspoints in the macro are changed. All other crosspoints will remain as they were before the macro was recalled.
The operation of the panel described here is based on panel software version 4.01.