SW222

SDI 2 x 2 switch

USER MANUAL

Crystal Vision

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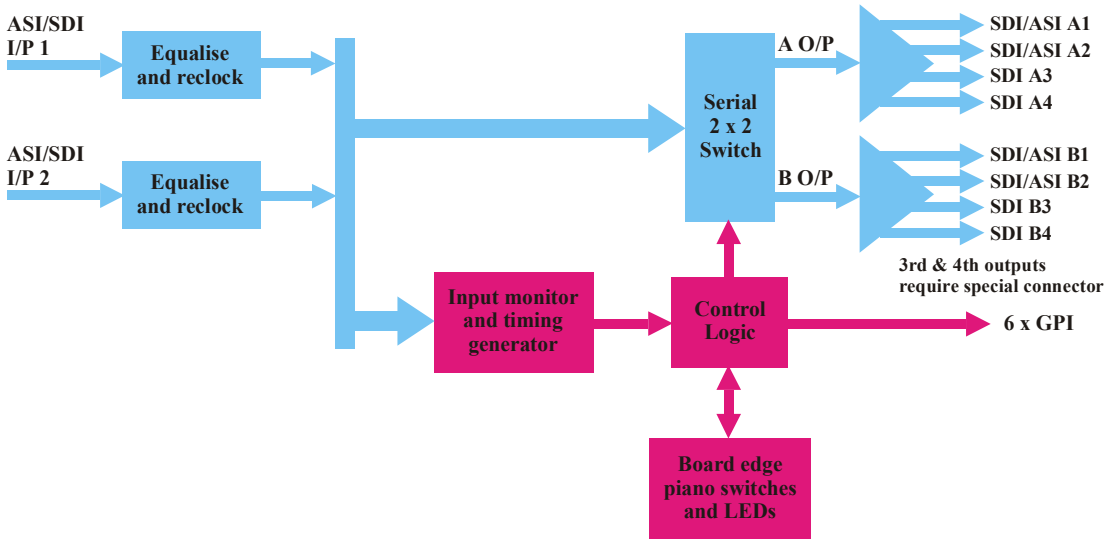
Revision 4 Rear module connection table corrected 10/01/07

1 Introduction

The SW222 is a 10-bit 2x2 Serial Digital switch. Each of two serial digital inputs can be switched to either or both of two outputs. Switching can be controlled separately or together, either from the board or from remote inputs.



SW222 SDI 2 x 2 Switch

The unit can be configured to switch automatically on input failure if required. Local and remote indications of input status and switch selection are provided. The unit can automatically detect the video standard and switch at the appropriate point in the frame-blanking period or, in some modes, switch immediately upon remote command.

When used with the RM38 rear connector module relay bypass is available. This rear module will switch input 1 to output 1 and input 2 to output 2 on complete frame power failure or if the SW222 should be removed from the frame.

The main features are as follows:

- SDI or DVB-ASI 2 x 2 switching
- Up to 4 reclocked outputs of both switched signals
- Independent or opposite paired outputs (1>A, 2>B or 1>B, 2>A)
- Switch immediately or in vertical blanking
- Error indication of missing input signal
- Flexible yet simple remote control and/or board edge control
- Status via GPIs and/or board edge LEDs
- Relay bypass available when used with the RM38 rear connector module

Default outputs are two pairs of reclocked DVB-ASI complaint serial digital. Additional four serial digital outputs are available depending on which rear modules are fitted. The extra outputs are not DVB-ASI complaint.

It is very compact with 6 modules fitting in a 1U frame and 12 modules in a 2U frame and 24 in a 4U frame. The unit plugs into the front of the rack frame, and the universal connection system allows a mixture of Crystal Vision modules to be used in the 1U/2U and 4U frames.

Typical applications:

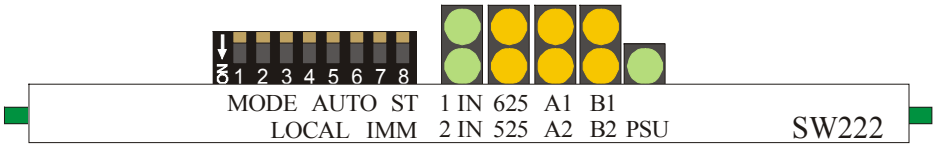
- Emergency SDI or DVB-ASI transmission bypass switcher – with preview output
- automated n x 2 redundancy changeover switch
- Automatic fail safe switch
- Simple 2x2 manual changeover selector

Both local and remote control and tally indication is provided, making the unit ideal for use from the critical-paths of complex automated multi-channel systems to the smallest edit suite.

Note. for relay bypass operation a minor modification to the SW222 board may be necessary depending on PCB issue. See Chapter 3 Installation.

2 Operation

The hinged front panel of the case reveals user control of the card, and also LED indication of input status and switch routing. The 8-way piano switch allows the operating modes, switching options and status options to be selected.



The SW222 front edge view

Lever	Function	Up	Down
1-3	MODE	Select control mode (see next table)	
4	A OUT	Input 1 (mode dependant)	Input 2 (mode dependant)
5	B OUT	Input 1 (mode dependant)	Input 2 (mode dependant)
6	AUTO	Automatically switches away from missing input	Forces outputs to set inputs.
7	IMMEDIATE	Switches in next frame blanking	Switches immediately upon remote control (mode dependant)
8	STATUS	Dual input/output on 4 GPI lines	Input only on 4 GPI lines (mode dependant)

8-Way DIL switch functions

LED	Colour	Meaning when lit
1 IN	Green (top)	Valid serial digital input detected input 1.
2 IN	Green (bottom)	Valid serial digital input detected input 2.
625	Yellow (top)	625-line input detected input 1.
525	Yellow (bottom)	525-line input detected input 1.
A1	Yellow (top)	Input 1 routed to Output A
A2	Yellow (bottom)	Input 2 routed to Output A
B1	Yellow (top)	Input 1 routed to Output B
B2	Yellow (bottom)	Input 2 routed to Output B
PSU	Green	Power supply voltage present.

LED assignments

Control modes

To provide maximum flexibility a number of different controls options are available. Piano switches 1-3 chose the control option as follows: -

Function	Mode	1	2	3
Both channels selected by a single local piano switch	O	Up	Up	Up
Each channel selected by separate local piano switches	I	Up	Up	Down
Both channels toggled by repeated action of a single remote momentary switch	O	Up	Down	Up
Each channel toggled by repeated action of separate remote momentary switches	I	Up	Down	Down
Both channels selected by most recent of two remote momentary switches	O	Down	Up	Up
Each channel selected by most recent of two remote momentary switches	I	Down	Up	Down
Both channels selected by a single remote toggle switch	O	Down	Down	Up
Each channel selected by separate remote toggle switches	I	Down	Down	Down

MODE	Description
I	A/B output channels controlled independently
O	A/B output channels always on opposite selection

The control modes are discussed in more detail in the next section ‘Using control modes’.

Auto switching on missing input

If piano switch 6 (AUTO) is up, outputs A and B will automatically switch away from a missing input. The status outputs ('a' to 'd', depending on control mode) will indicate the actual status of the routing. If the missing input returns, the SW222 will revert to the selected routing.

If piano switch 6 (AUTO) is down, outputs A and B will maintain their selected routing irrespective of input conditions.

Frame-synchronised or immediate switching

After receiving a control signal, the SW222 will, by default, change routing at the appropriate point in the next frame-blanking period. In some modes it is possible to disable this feature so that the routing changes within a few microseconds of the control signal. This simplifies use with sources of timed control signals such as mixers.

If piano switch 7 (IMMEDIATE) is down, routing will change within a few microseconds of the control signal. This facility is only available when the routing is controlled by remote toggle switches (not on momentary control). If piano switch 7 is up, routing will change during the next frame-blanking period.

Status switching

In some modes the GPI lines are bi-directional – they are used both as control inputs and status outputs. If piano switch 8 (STATUS) is down, the status outputs will be disabled in these modes. This simplifies use where multiple SW222s are controlled by one set of remote controller. In the corresponding control mode, if piano switch 8 is up, the GPI lines will be bi-directional.

2.1 Using control modes

Independent channel selection

The four independent operational modes their switching options and GPI assignments are as follows:

Each channel selected by separate local piano switches

Lever	Function	Up	Down
4	A OUT	Input 1	Input 2
5	B OUT	Input 1	Input 2
7	IMMEDIATE	Switches in next frame blanking	Switches in next frame blanking

Use levers 4,5 and 7 to set switching options

GPIs	When open (+5V)	When grounded
'a'	Not used	Not used
'b'	Status - Input 1 routed to Output A	Status - Input 2 routed to Output A
'c'	Not used	Not used
'd'	Status - Input 1 routed to Output B	Status - Input 2 routed to Output B
'e'	Status - Input 1 absent.	Status - Input 1 present.
'f'	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments for current mode

Each channel selected by separate remote toggle switches

Lever	Function	Up	Down
4	A OUT	Input 1	Input 2
5	B OUT	Input 1	Input 2
7	IMMEDIATE	Switches in next frame blanking	Switches immediately upon remote control

Use levers 4,5 and 7 to set switching options

GPIs	When open (+5V)	When grounded
'a'	Control - Route Input 2 to Output A	Control - Route Input 1 to Output A
'b'	Status - Input 1 routed to Output A	Status - Input 2 routed to Output A
'c'	Control - Route Input 2 to Output B	Control - Route Input 1 to Output B
'd'	Status - Input 1 routed to Output B	Status - Input 2 routed to Output B
'e'	Status - Input 1 absent.	Status - Input 1 present.
'f'	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments for current mode

Each channel selected by two remote momentary switches

Lever	Function	Up	Down
4	A OUT	Input 1	Input 2
5	B OUT	Input 1	Input 2
7	IMMEDIATE	Switches in next frame blanking	Switches in next frame blanking
8	STATUS	Dual control/status on GPI lines 'a' to 'd'	Control only on GPI lines 'a' to 'd'

Use levers 4,5,7 and 8 to set switching options

Piano switches 4 & 5 as shown above determine power-up routing. Subsequently, each input will be selected (during frame blanking) each time the corresponding momentary switch is closed and released. With piano switch 8 down, indicator outputs are disabled to allow the remote controls of a number of SW222s to be connected in parallel.

GPIs	When open (+5V)	When grounded
'a'	Status - Input 2 routed to Output A.	Status - Input 1 routed to Output A. Control (momentary action) – Route Input 1 to Output A.
'b'	Status - Input 1 routed to Output A.	Status - Input 2 routed to Output A. Control (momentary action) – Route Input 2 to Output A.
'c'	Status - Input 2 routed to Output B.	Status - Input 1 routed to Output B. Control (momentary action) – Route Input 1 to Output B.
'd'	Status - Input 1 routed to Output B.	Status - Input 2 routed to Output B. Control (momentary action) – Route Input 2 to Output B.
'e'	Status - Input 1 absent.	Status - Input 1 present.
'f'	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments – Status enabled (piano switch 8 up)

GPIs	When open (+5V)	When grounded
'a'	Not used.	Control (momentary action) – Route Input 1 to Output A.
'b'	Not used.	Control (momentary action) – Route Input 2 to Output A.
'c'	Not used.	Control (momentary action) – Route Input 1 to Output B.
'd'	Not used.	Control (momentary action) – Route Input 2 to Output B.
'e'	Status - Input 1 absent.	Status - Input 1 present.
'f'	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments – Status disabled (piano switch 8 down)

Each channel toggled by separate remote momentary switches

Lever	Function	Up	Down
4	A OUT	Input 1	Input 2
5	B OUT	Input 1	Input 2
7	IMMEDIATE	Switches in next frame blanking	Switches in next frame blanking

Use levers 4,5 and 7 to set switching options

Piano switches 4 & 5 as shown above determine power-up routing. Subsequently, each input will be selected (during frame blanking) each time the corresponding momentary switch is closed and released.

GPIs	When open (+5V)	When grounded
'a'	Status - Input 2 routed to Output A.	Control (momentary action) – toggle routing to Output A.
'b'	Status - Input 1 routed to Output A.	Status - Input 2 routed to Output A.
'c'	Status - Input 2 routed to Output B.	Control (momentary action) – toggle routing to Output B.
'd'	Status - Input 1 routed to Output B.	Status - Input 2 routed to Output B.
'e'	Status - Input 1 absent.	Status - Input 1 present.
'f'	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments

Alternate channel selection

The four ‘opposite selection’ or ‘alternate’ operational modes, their switching options and GPI assignments are as follows:

Both channels selected by a single local piano switch

Lever	Function	Up	Down
4	A OUT	Input 1 routed to Output A	Input 2 routed to Output A
		Input 2 routed to Output B	Input 1 routed to Output B
5	B OUT	Not used	Not used
7	IMMEDIATE	Switches in next frame blanking	Switches in next frame blanking

Use levers 4,5 and 7 to set switching options

Piano switches 4 & 5 as shown above determine power-up routing. Subsequently, each input will be selected (during frame blanking) each time the corresponding momentary switch is closed and released.

GPIs	When open (+5V)	When grounded
‘a’	Not used.	Not used.
‘b’	Not used.	Not used.
‘c’	Status - Input 1 routed to Output A.	Status – Input 2 routed to Output A.
	Status - Input 2 routed to Output B.	Status – Input 1 routed to Output B.
‘d’	Status – Input 2 routed to Output A.	Status - Input 1 routed to Output A.
	Status - Input 1 routed to Output B.	Status – Input 2 routed to Output B.
‘e’	Status - Input 1 absent.	Status - Input 1 present.
‘f’	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments for current mode

Both channels selected by a single remote toggle switch

Lever	Function	Up	Down
4	A OUT	Not used.	Not used.
5	B OUT	Not used.	Not used.
7	IMMEDIATE	Switches in next frame blanking	Switches immediately upon remote control

Use levers 4,5 and 7 to set switching options

GPIs	When open (+5V)	When grounded
'a'	Control - Input 2 routed to Output A.	Control - Input 1 routed to Output A.
	Control - Input 1 routed to Output B.	Control - Input 2 routed to Output B.
'b'	Not used.	Not used.
'c'	Status - Input 1 routed to Output A.	Status - Input 2 routed to Output A.
	Status – Input 2 routed to Output B.	Status – Input 1 routed to Output B.
'd'	Status - Input 2 routed to Output A.	Status - Input 1 routed to Output A.
	Status – Input 1 routed to Output B.	Status – Input 2 routed to Output B.
'e'	Status - Input 1 absent.	Status - Input 1 present.
'f'	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments

Both channels selected by two remote momentary switches

Lever	Function	Up	Down
4	A OUT	Input 1 routed to Output A	Input 2 routed to Output A
		Input 2 routed to Output B	Input 1 routed to Output B
5	B OUT	Not used.	Not used.
7	IMMEDIATE	Switches in next frame blanking	Switches in next frame blanking

Use levers 4,5 and 7 to set switching options

Power-up routing is determined by piano switch 4 as shown above. Subsequently, each input will be selected (during frame blanking) each time the corresponding momentary switch is closed and released.

GPIs	When open (+5V)	When grounded
'a'	No Change	Control (momentary action) – Input 1 routed to Output A, Input 2 routed to Output B.
'b'	No Change	Control (momentary action) – Input 2 routed to Output A, Input 1 routed to Output B.
'c'	Status - Input 1 routed to Output A.	Status - Input 2 routed to Output A.
	Status – Input 2 routed to Output B.	Status – Input 1 routed to Output B.
'd'	Status - Input 2 routed to Output A.	Status - Input 1 routed to Output A.
	Status – Input 1 routed to Output B.	Status – Input 2 routed to Output B.
'e'	Status - Input 1 absent.	Status - Input 1 present.
'f'	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments

Both channels toggled by single remote momentary switch

Lever	Function	Up	Down
4	A OUT	Input 1 routed to Output A	Input 2 routed to Output A
		Input 2 routed to Output B	Input 1 routed to Output B
5	B OUT	Not used.	Not used.
7	IMMEDIATE	Switches in next frame blanking	Switches in next frame blanking

Use levers 4,5 and 7 to set switching options

Power-up routing is determined by piano switch 4 as shown above. Subsequently, each input will be selected (during frame blanking) each time the corresponding momentary switch is closed and released.

GPIs	When open (+5V)	When grounded
'a'	No Change	Control (momentary action) – toggle routing to Output A and Output B.
'b'	Not Used	Not used.
'c'	Status - Input 1 routed to Output A.	Status - Input 2 routed to Output A.
	Status – Input 2 routed to Output B.	Status – Input 1 routed to Output B.
'd'	Status - Input 2 routed to Output A.	Status - Input 1 routed to Output A.
	Status – Input 1 routed to Output B.	Status – Input 2 routed to Output B.
'e'	Status - Input 1 absent.	Status - Input 1 present.
'f'	Status - Input 2 absent.	Status - Input 2 present.

GPI assignments

3 Installation

The SW222 2x2 switch single height module fits into all Crystal Vision rack frames. All modules can be plugged in and removed while the frame is powered without damage.

3.1 Rear modules and signal I/O

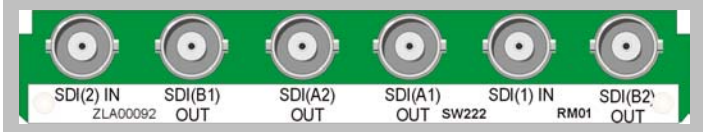
Indigo 4, 2, 1 and Desktop box rear connectors

The Indigo 4 frame can accommodate up to 24 SW222 cards. The Indigo 2 frame takes up to 12 cards, six cards will fit in the Indigo 1 frame and 2 will fit in the Indigo DT Desktop box.

The available rear connectors are as follows:

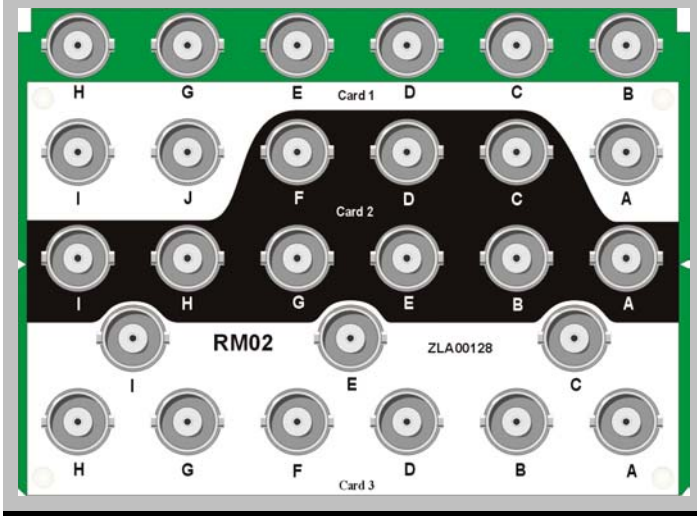
There are four types of rear connector available for the FR2AV and Indigo frame. This provides system flexibility by allowing a mix between access to all connections and maximum module packing density. Relay bypass is available with the RM38

Rear module connections with RM01

FR2AV, FR1AV & DTBAV rear connectors	Description
	**RM01 (ZLA00075 artwork)** • 24 cards per Indigo 4, 12 cards per Indigo 2, 6 per Indigo 1 & 2 per Indigo DT • All frame slots can be used

BNC	Description
SDI(B2) OUT	Reclocked ASI-compliant Serial Digital Output (channel 2).
SDI(1) IN	Serial Digital Input channel 1.
SDI(A1) OUT	Reclocked ASI-compliant Serial Digital Output (channel 1).
SDI(A2) OUT	Reclocked ASI-compliant Serial Digital Output (channel 1).
SDI(B1) OUT	Reclocked ASI-compliant Serial Digital Output (channel 2).
SDI(2) IN	Serial Digital Input channel 2.

Rear module connections with RM02

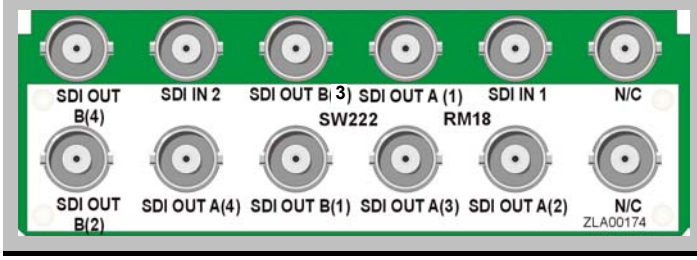
FR2AV rear connector	Description
	**RM02 (ZLA00128 artwork)** • 18 cards per Indigo 4 frame • 3 modules per rear connector • 9 connections available • Card 1 fits in slots 1, 5 and 9 • Card 2 fits in slots 2, 6 and 10 • Card 3 fits in slots 4, 8 and 12 • No card fits in 3, 7 or 11

BNC	Card 1 Description
A	Serial Digital Input channel 1.
B	Reclocked ASI-compliant Serial Digital Output (channel 1).
C	Reclocked ASI-compliant Serial Digital Output (channel 1).
D	Reclocked Serial Digital Output (channel 1).
E	Reclocked Serial Digital Output (channel 2).
F	Reclocked ASI-compliant Serial Digital Output (channel 2).
G	Reclocked Serial Digital Output (channel 2).
H	Reclocked ASI-compliant Serial Digital Output (channel 2).
I	Serial Digital Input channel 2.

BNC	Card 2 Description
A	Serial Digital Input channel 1.
B	Reclocked ASI-compliant Serial Digital Output (channel 1).
C	Reclocked ASI-compliant Serial Digital Output (channel 1).
D	Reclocked Serial Digital Output (channel 1).
E	Reclocked Serial Digital Output (channel 2).
F	Reclocked ASI-compliant Serial Digital Output (channel 2).
G	Reclocked Serial Digital Output (channel 2).
H	Serial Digital Input channel 2.
I	Reclocked ASI-compliant Serial Digital Output (channel 2).

BNC	Card 3 Description
A	Serial Digital Input channel 1.
B	Reclocked ASI-compliant Serial Digital Output (channel 1).
C	Reclocked ASI-compliant Serial Digital Output (channel 1).
D	Reclocked Serial Digital Output (channel 1).
E	Reclocked Serial Digital Output (channel 2).
F	Reclocked ASI-compliant Serial Digital Output (channel 2).
G	Reclocked Serial Digital Output (channel 2).
H	Reclocked ASI-compliant Serial Digital Output (channel 2).
I	Serial Digital Input channel 2.

Rear module connections with RM18

FR2AV, FR1AV & DTBAV rear connectors	Description
	**RM18 (ZLA00174 artwork)** • 12 cards per Indigo 4 frame, 6 per Indigo 2, 3 per Indigo 1 & 1 per Indigo DT • 1 module per rear connector • 10 connections available • Card fits in upper slot • No card fits in lower slot

BNC	Description
N/C	No connection
SDI IN 1	Serial Digital Input channel 1.
SDI OUT A (1)	Reclocked ASI-compliant Serial Digital Output (channel 1).
SDI OUT B (3)	Reclocked Serial Digital Output (channel 2).
SDI IN 2	Serial Digital Input channel 2.
SDI OUT B (4)	Reclocked ASI-compliant Serial Digital Output (channel 2).
N/C	No connection
SDI OUT A (2)	Reclocked ASI-compliant Serial Digital Output (channel 1).
SDI OUT A (3)	Reclocked Serial Digital Output (channel 1).
SDI OUT B (1)	Reclocked Serial Digital Output (channel 2).
SDI OUT A (4)	Reclocked Serial Digital Output (channel 1).
SDI OUT B (2)	Reclocked ASI-compliant Serial Digital Output (channel 2).

Rear module connections with RM38

The RM38 has the addition of bypass relays fitted to loop the input programme to the outputs should there be a catastrophic frame supply/mains failure or SW222 card removal.

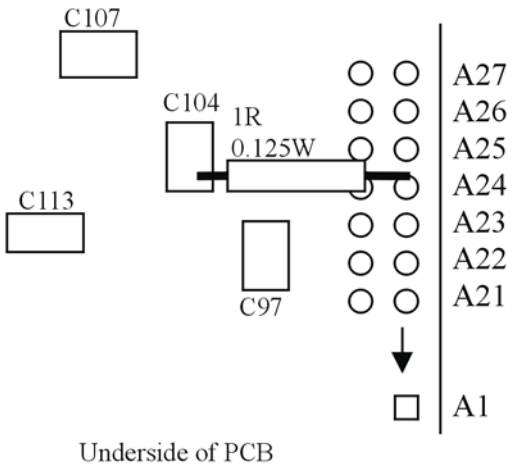
Indigo & FR-AV rear connectors	Description
	**RM38** • 24 cards per Indigo 4, 12 cards per Indigo 2, 6 per Indigo 1 & 2 per Indigo DT • All frame slots can be used

BNC	Description
SDI IN 1	Serial Digital Input channel 1.
SDI OUT A1	Reclocked ASI-compliant Serial Digital Output (channel 1). (SDI IN 1 loop on fail)
SDI OUT A2	Reclocked ASI-compliant Serial Digital Output (channel 1).
SDI OUT B2	Reclocked ASI-compliant Serial Digital Output (channel 2).
SDI OUT B1	Reclocked ASI-compliant Serial Digital Output (channel 2). (SDI IN 2 loop on fail)
SDI IN 2	Serial Digital Input channel 2.

SW222 modification information for using the RM38

SW222 PCB Issue number

Issue 2 No modification required
Issue 3 No modification required
Issue 4 No modification required
Issue 5 Connect as 1R wire ended resistor between PL1 pin A24 and C104 +5v end
Issue 6 Mod level 1-5. Connect as 1R wire ended resistor between PL1 pin A24 and C104 +5v end
Issue 6 Mod level 6 and above no modification required



Modification for RM38 relay bypass operation

3.2 GPI connections

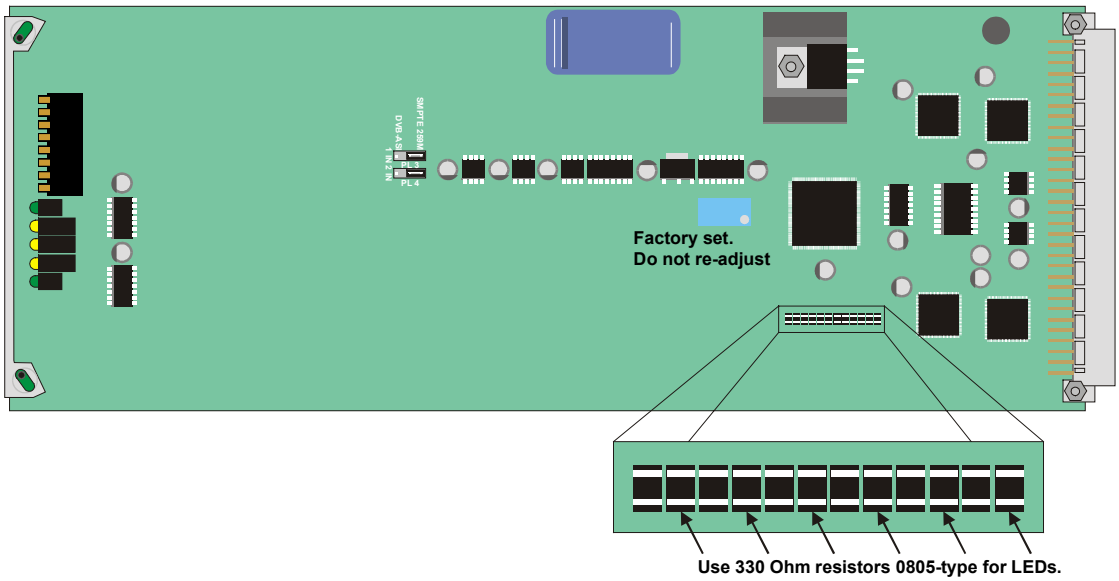
Each slot has an associated set of GPI connections for remote control and external status outputs on the frame rear-panel remote connectors. For convenience, GPI lines are associated with reference codes ‘a’ to ‘f’ in the connector pin-out tables for each frame.

	OPEN (+5V)	GROUND
‘a’ ‘b’ ‘c’ ‘d’	Mode dependent	
‘e’	Input 1 absent.	Input 1 present.
‘f’	Input 2 absent.	Input 2 present.

GPI input and outputs assignment is mode dependent – see Operation chapter

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

GPI output connections have 0Ω series resistors fitted (to drive +5V to +24V bulbs) and 10k Ω pull-up to +5V (to drive a remote input). LEDs can be used by changing the series resistors to 330 Ω 0805-type. See illustration below.



Change the six resistors arrowed to 330Ω 0805 type for external status LEDs

TIP:

330Ω resistors may be fitted externally if required

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	Upper	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	Lower	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 1A. Remotes 5-8 are similarly protected.

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 and 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 and +5V @500mA is pin 15 in each case.

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 1A.

Indigo 1 and Indigo DT Desktop box 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 socket. Frame ground is pin 2 and +5V @500mA is pin 1.

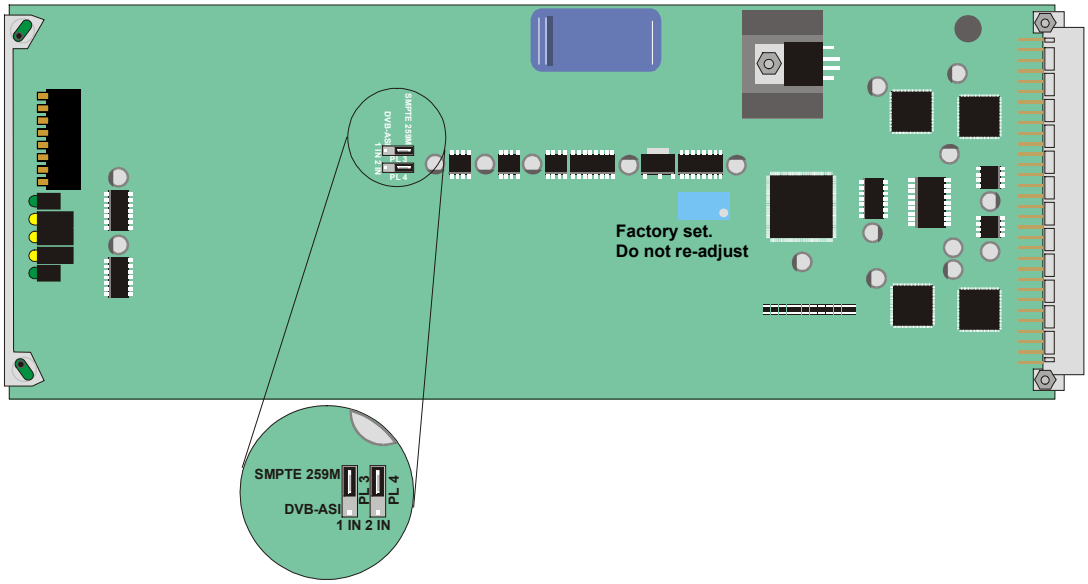
Remote 2: 26 way high-density D-type plug. Frame ground is pin 6 and +5V @500mA is pin 15.

3.3 DVB/SDI configuration

If inputs 1 and 2 are DVB-ASI signals, for the input detect LEDs and GPI status lines to function correctly, jumper links PL3 (input 1) and PL4 (input 2) must be moved to the DVB-ASI position.

With PL3 & PL4 in the DVB-ASI position and piano switch 6 up, the SW222 will automatically switch away from a missing DVB-ASI input.

With PL3 & PL4 in the DVB-ASI position, the SW222 will function fully with SMPTE-259M inputs although, at long cable lengths, performance of the input detection and auto-switching functions may be diminished.

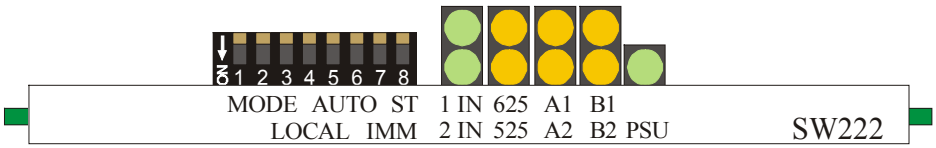


SW222 showing DVB-ASI/SDI configuration jumpers PL3 and PL4

4 Problem solving

Card edge status LEDs

Board edge LEDs provide status reporting and may be useful when fault finding.



SW222 status LEDs

The following table summarises the card edge LED functions and colours:

LED	Colour	Meaning when lit
1 IN	Green (top)	Valid serial digital input detected input 1.
2 IN	Green (bottom)	Valid serial digital input detected input 2.
625	Yellow (top)	625-line input detected input 1.
525	Yellow (bottom)	525-line input detected input 1.
A1	Yellow (top)	Input 1 routed to Output A
A2	Yellow (bottom)	Input 2 routed to Output A
B1	Yellow (top)	Input 1 routed to Output B
B2	Yellow (bottom)	Input 2 routed to Output B
PSU	Green	Power supply voltage present.

LED assignments

Basic fault finding guide

The Power OK LED is 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 valid SDI or DVB-ASI input(s) are present and that any cabling is intact

The video output is not synchronous with other sources when switched

Check that both inputs are already synchronous and correctly timed as required by the overall system

Switching does not take place in the vertical interval

Check that DIP switch 7 is in the UP position or that the remote trigger is correctly timed

Status indication does not work as expected

Check that board jumpers PL3 and PL4 are configured correctly for either SDI or DVB-ASI inputs

Switch does not change state when an input is missing

Check that DIL switch 6 is in the UP position

Outputs transpose input selection when switch operated

Check that the appropriate mode is selected with DIL switches 1, 2 and 3

Local input select controls do not work

Check that the appropriate mode is selected with DIL switches 1, 2 and 3

Remote operation has failed

Check that the appropriate mode is selected with DIL switches 1, 2 and 3

Check the remote cable connections and remote control facilities

External status LED or bulb illumination is incorrect

Check that the appropriate series resistors have been used and that any bulbs are rated correctly

Re-setting the card

If required, the card may be reset by simply removing the rack power and re-applying power after a few seconds or by removing the card from the rack re-inserting the card

It is safe to reinsert the card whilst the rack is powered

Relay bypass not functioning

Check Issue and modification level against information in chapter 3 Installation

5 Specification

General

Dimensions	100mm x 266 mm module with DIN 41612 connector
Weight	135g
Power consumption	5W

Inputs

2 x SDI /DVB-ASI	270Mb/s serial digital to EBU Tech 3267-E and SMPTE-259M DVB-ASI to EN 50083-9 Cable equalisation >200m Belden 8281 or equivalent (SDI). (Auto 625/525 line selection)

Outputs

2 x 2 SDI/ DVB-ASI	2 independent ports each with 4 buffered outputs (Ax2, Bx2) 4 reclocked 270Mb/s serial digital outputs per port to EBU Tech 3267-E and SMPTE-259M, 2 of which are DVB-ASI compliant to EN 50083-9 Each will drive >200m Belden 8281 or equivalent (SDI).

Switching

Timing	Between SAV or EAV on line 6 (625-line), line 10 (525-line) or immediate if input missing (or by local switch selection)
Control modes	Outputs A and B can be controlled separately, or output B can be forced to be the opposite of output A Control may be by local card edge switch, position of remote switch, repeated action of remote momentary switch and most recent operation of two remote momentary switches

GPI inputs

Operation	Active: connect to ground. Inactive: high impedance or 3 to 48 volts
Input current	<500µA

GPI outputs

Lamp drive	Active low with pull ups and 0Ω series resistors (default)
	330Ω series resistors may be used to drive LEDs (request when ordering)
max current	-300mA

Ordering information

SW222	2x2 SDI Switch. Suitable for SDI or DVB-ASI signals

Rear Connectors

RM01	Single height rear connector
RM38	Single height rear connector with relay bypass
RM18	Double height rear connector .
RM02	Quad height rear connector .

Frames

Indigo 4	4U frame with passive front panel for up to 24 modules
Indigo 2	2U frame with passive front panel for up to 12 modules
Indigo 1	1U frame with passive front panel for up to six modules
Indigo DT	Desk top box with passive front panel for up to two modules
Indigo 2A	2U frame, Statesman enabled with active control panel for up 12 modules
Indigo 1A	1U frame, Statesman enabled with active control panel for up six modules
Indigo DTA	Desk top box, Statesman enabled with active control panel for up two modules
Indigo 4SE	4U frame with passive front panel fitted with Statesman CPU for up to 24 modules
Indigo 2SE	2U frame with passive front panel fitted with Statesman CPU for up to 12 modules
Indigo 1S	1U frame with passive front panel fitted with Statesman CPU for up to six modules

Indigo DTS	Desk top box with passive front panel fitted with Statesman CPU for up to two 2 modules
Indigo 2-48V	48V 2U frame with passive front panel for up to 12 modules
Indigo 1-48V	48V 1U frame with passive front panel for up to six modules
Indigo 2AE-48V	48V 2U frame, Statesman enabled, with active control panel for up 12 modules
Indigo 1A-48V	48V 1U frame, Statesman enabled, with active control panel for up six modules
Indigo 2SE-48V	48V 2U frame with passive front panel fitted with Statesman CPU for up to 12 modules
Indigo 1S-48V	48V 1U frame with passive front panel fitted with Statesman CPU for up to six modules