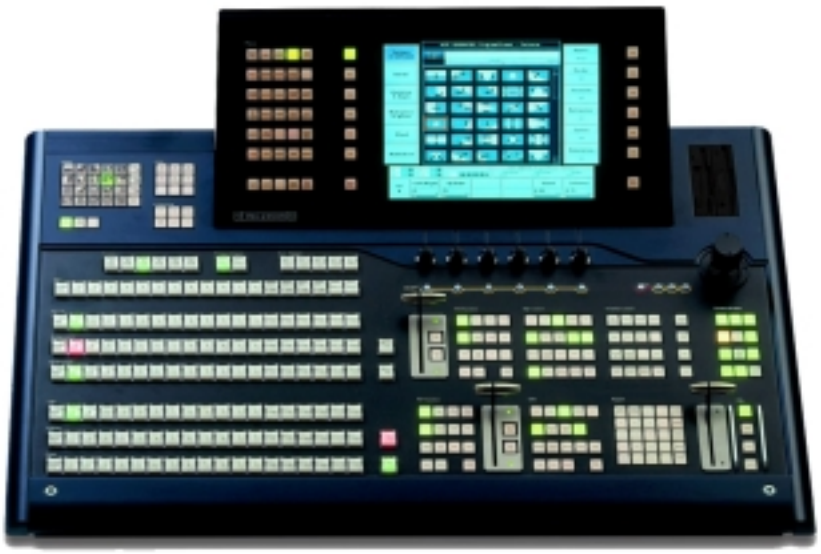
INSTALLATION MANUAL

SD1512



SD1512 Installation Manual for V3 Software
Issue 1, Revision 1, September 2003

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SAFETY

Explanation of Safety Symbols

This symbol refers the user to important information contained in the accompanying literature. Refer to users manual.

This symbol indicates that hazardous voltages are present inside. No user serviceable parts inside. This unit should only be serviced by trained personnel.

Safety Warnings

Servicing instructions, where given, are for use by qualified personnel only. To reduce risk of electric shock do not perform any actions on this equipment other than contained in the operating instructions, unless you are qualified to do so. Refer all servicing to qualified personnel.

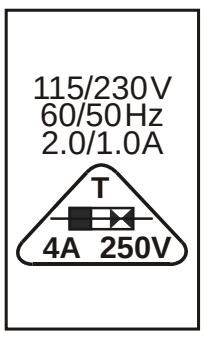
WARNING TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

- **Always ensure that the unit is properly earthed and power connections correctly made.**
- **This equipment must be supplied from a power system providing a PROTECTIVE EARTH connection and having a neutral connection which can be reliably identified.**
- **The power outlet supplying power to the unit should be close to the unit and easily accessible**

Power Supply and Connections

Mains Supply Voltage

Before connecting the equipment, observe the safety warnings section and ensure that the local mains supply is within the rating stated on the rear of the equipment.

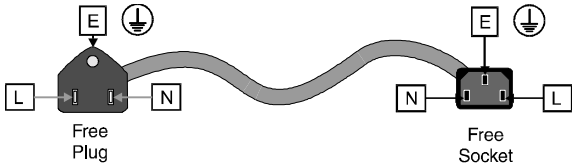


The SD1512 systems have power supplies that are suitable for voltages of 115V (+6% -10%) and 230V (+/-10%) @ 50 and 60Hz.

Power cable supplied for the USA

The equipment is shipped with a power cord with a standard IEC molded free socket on one end and a standard 3-pin plug on the other. If you are required to remove the molded mains supply plug, dispose of the plug immediately in a safe manner. The color code for the lead is as follows:

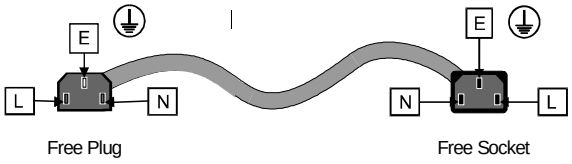
GREEN lead connected to E
(Protective Earth Conductor)
WHITE lead connected to N
(Neutral Conductor)
BLACK lead connected to L
(Live Conductor)



Power cable supplied for countries other than the USA

The equipment is shipped with a power cable with a standard IEC moulded free socket on one end and a standard IEC moulded plug on the other. If you are required to remove the moulded mains supply plug, dispose of the plug immediately in a safe manner. The colour code for the lead is as follows:

GREEN/YELLOW lead connected to E
(Protective Earth Conductor)
BLUE lead connected to N
(Neutral Conductor)
BROWN lead connected to L
(Live Conductor)

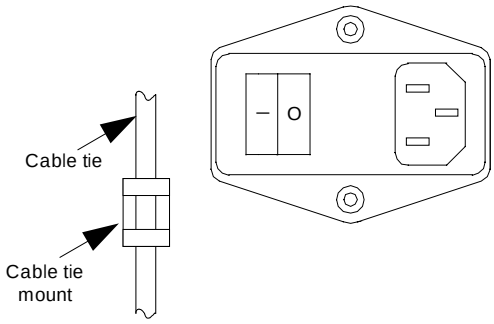


Control Panel Power cable tie

A cable tie mount is located by the power inlet on the control panel. A cable tie may be used to fix the power cable to the unit to prevent accidental disconnection of power.

If this facility is used allow enough cable after the tie to allow the power plug to be easily removed from and inserted into the power socket.

Min length after tie = 20mm



Battery Warnings

Lithium Battery - There is a Lithium battery on the VME card which is mounted “piggy-back” on the Mainframe CPU card.

If this battery is incorrectly replaced there is a danger of explosion!

Ensure that the same make and model of battery is used if replacement is required (a manufacturer recommended equivalent may be used if the original type is not available). Used batteries should only be disposed of according to the manufacturers instructions. The battery must only be replaced by a trained service technician.

Empty Holder - There is an empty battery holder on the MBX card in the Control Panel, this holder is not used.

No battery should be fitted to this card!

Maintenance & Repair

There are no user serviceable parts within either the Mainframe or the Control Panel.

In the unlikely event of an equipment failure contact the Snell & Wilcox Post Production Customer Support department, contact details below:

Telephone + 44 (0) 1799 508100 or + 44 (0) 1799 508300

Fax + 44 (0) 1799 508800

e-mail post.support@snellwilcox.com

Cooling Fan Failure

IF THE COOLING FANS AT THE REAR OF THE SD1000 SWITCHER MAINFRAME SHOULD STOP FOR ANY REASON, THEN THE SYSTEM SHOULD BE SWITCHED OFF IMMEDIATELY OR PERMANENT DAMAGE MAY RESULT.

Depending on the length of time the mainframe has been run with no fan the unit may need to be returned for checking and repair. Contact Snell and Wilcox or your Snell and Wilcox dealer to discuss the situation.

Safety Standards

This equipment complies with the following standards:

BS EN60950 (2000)
Safety of information Technology Equipment Including Electrical Business Equipment.

EMC Standards

This unit conforms to the following standards:

BS EN 55103-1 : 1997
Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 1. Emission

BS EN 55103-2 : 1997
Electromagnetic Compatibility, Product family standard for audio, video, audio-visual and entertainment lighting control apparatus for professional use. Part 2. Immunity

Federal Communications Commission Rules Part 15, Class A :1998

EMC Environment

The product(s) described in this manual conform to the EMC requirements for, and are intended for use in,

either

The commercial and light industrial environment (including, for example, theatres) E2

or

The controlled EMC environment (e.g., purpose-built broadcasting or recording studios), and the rural outdoor environment (far away from railways, transmitters, overhead power lines, etc.) E4

EMC Performance of Cables and Connectors

Snell & Wilcox products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.
All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

COAXIAL CABLES
Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M.

D-TYPE CONNECTORS
D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having "dimples" which improve the contact between the plug and socket shells, are recommended.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

SECTION A

INSTALLATION

ELECTRICAL SUPPLY CONNECTION

WITH TWIN POWER SUPPLIES USE BOTH POWER INPUT CONNECTORS

INTRODUCTION

These installation instructions provide a guide to the installation of the SD1512 Switcher.

ON DELIVERY OF THE SYSTEM

The equipment is supplied in dedicated packaging provided by the manufacturer and should not be accepted if delivered in inferior or unauthorised materials.

Carefully unpack the system components and check them against the packing list. If there is anything incorrect, notify your dealer or Snell and Wilcox directly at once.

Check that the equipment has not been damaged in transit. If any damage has occurred, notify your dealer or Snell and Wilcox directly at once as well as the carrier.

Always retain the original packing materials if possible, they could prove useful should it ever be necessary to transport or ship the system units.

The system components are:

- SD1000 Switcher Mainframe
- CP1512 Control Panel
- LCD Touch Screen module
- 25-way D-type cable to link Control Panel and LCD Touch Screen module
- 9-way D-type cable to link Control Panel and LCD Touch Screen module
- 10 Base-T cable to link Control Panel and Switcher Mainframe
- User manual.

LOCATION AND ENVIRONMENT

Environmental Considerations

The ambient temperature for all the supplied equipment should not exceed the limits of 5 and 35 degrees C. at a relative humidity of 10 to 90% (non-condensing).

Installing the equipment in a clean environment with moderate temperature and humidity will promote a long and trouble-free equipment life.

Location

The SD1000 Mainframe may be used free-standing (table-top configuration) or installed in a standard 483mm (19 inch) equipment rack. The following precautions should be observed:

a) The cooling fan exhausts at the rear of the unit must not be obstructed - a minimum clearance of 200mm (8 inches) is **ESSENTIAL**.

b) The slots in the front panel are to allow the inlet of cooling air and **MUST NOT BE OBSTRUCTED.**

c) When mounting the mainframe in an equipment rack it **MUST** be supported at the rear, not by the rack-mounting ears alone.

Cooling is provided by drawing air in at the front of the unit and exhausting it at the rear.

The mainframe should never be operated for any significant period of time with any covers removed as this will affect the internal airflow and cause overheating.

Control Panel Installation

The control panel is designed to stand freely on a tabletop.

If it is necessary to secure the control panel to a control desk (e.g., in an OB van) the control panel has to be opened. This installation MUST be carried out by a qualified Installation or Service engineer.

Battery

⚠ WARNING -

There is a battery holder on the MBX card within the Control Panel which is not used.

No battery should be fitted to this card

LOCATION AND ENVIRONMENT - *continued*

Power Supply

All three major parts of the system - Switcher Mainframe, Router Mainframe, and Control Panel - have the option to be fitted with dual power supplies. In each case the unit will work happily with a single power-supply connected if required.

For safety a mains earth connection MUST be provided.

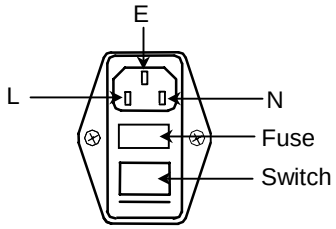
Fusing

The control panel is protected by a 4 amp, and the mainframe by a 5 amp, anti-surge (slow-blow) fuse located in the mains inlet / power switch assembly, see diagram below.

E = Protective Earth Conductor

N = Earthed Neutral Conductor

L = Phase Conductor



SYSTEM INTERCONNECTION

Introduction

Your system has been set up and tested before shipment. Installation normally consists of siting and interconnecting the system components, connecting video and key inputs and outputs and setting up.

Control Panel

- Remove and keep the supplied nuts and washers from the two bolts on the top of the Control Panel.
- Remove the LCD Touch Screen module from the packaging.
- Carefully fit it over the two bolts on the top of the Control Panel.
- Fix down the LCD Touch Screen using the washers and nuts that you removed earlier.
- Secure the earth strap between the Touch Screen module and the Control Panel using the fixings provided.
- Connect the 25-pin D connector to the similar one on the rear of the Control Panel using the cable provided.
- Connect the 9-way D connector to the similar one on the rear of the Control Panel using the cable provided.
- If desired, a standard VGA monitor can be plugged into the 15-way sub-D connector at the bottom rear of the panel. The signal frequency should be acceptable to the vast majority of VGA-compatible monitors (see Specifications Section).
- Finally, connect the 10 Base-T connector on the Control Panel to the socket on the Switcher Mainframe marked "**Panel 10 BASE TX**" using the cable provided.

Connecting Panel to an "Alternate Mainframe"

The CP1512 Control Panel can be used to control another (Alternate) mainframe, e.g., a HD system. The IP address of the alternate mainframe is set in the Miscellaneous - IP Address menu. The alternate mainframe is connected to the primary mainframe via the 10 BASE T sockets.

Connect the 10 BASE T socket on the rear panel of the primary (Master) mainframe (adjacent to the Panel 10 BASE TX connector) to the Panel 10 BASE TX socket on the alternate mainframe.

Power

Switch all power switches to their OFF states. Connect IEC power cables from the power socket(s) on the rear of the Switcher Mainframe and Control Panel to the appropriate AC mains distribution socket(s).

Button Bus Multi Control

Button Bus Multi Control is a facility which allows one switcher control panel to control two switcher mainframes simultaneously, so, for example, a program can be produced in both HD and SD at the same time from one control panel.

The basic Button Bus function is a RS422 protocol which outputs a serial code on a selected mainframe serial port when a key is pressed or released. By connecting two mainframes together this facility may be used to allow one control panel to control two mainframes simultaneously using the function "Button Bus Multi Control".

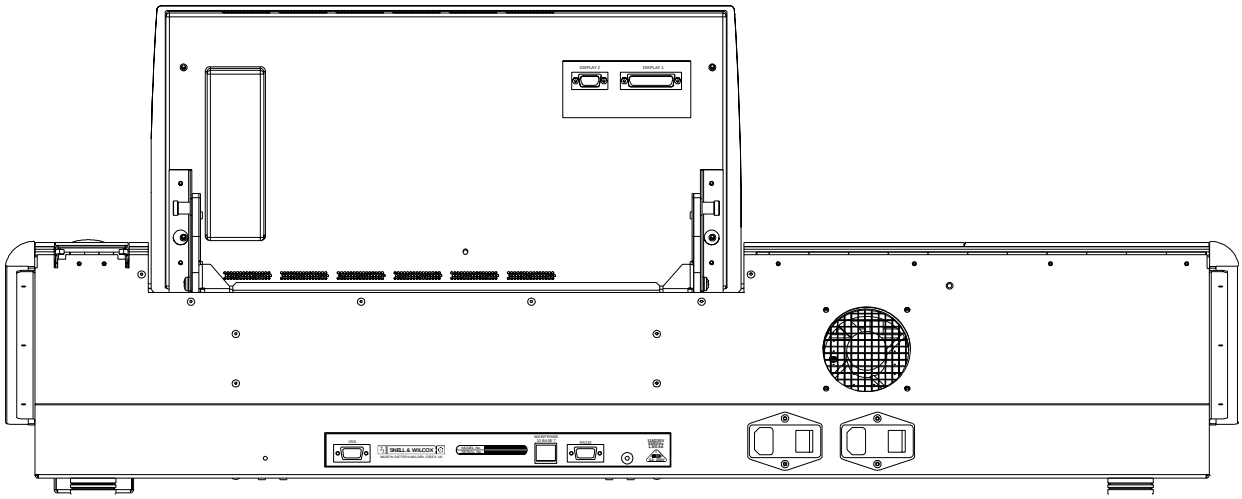
To use this facility ensure that both mainframes have the same set-up and are in the same operational situation otherwise problems will arise when using certain control buttons such as toggle functions.

Set one of the serial ports on each of the two mainframes to "B Bus Multi Ctl" using the Config – System – Set Port Protocols. Connect these two ports together using a RS422 swap cable.

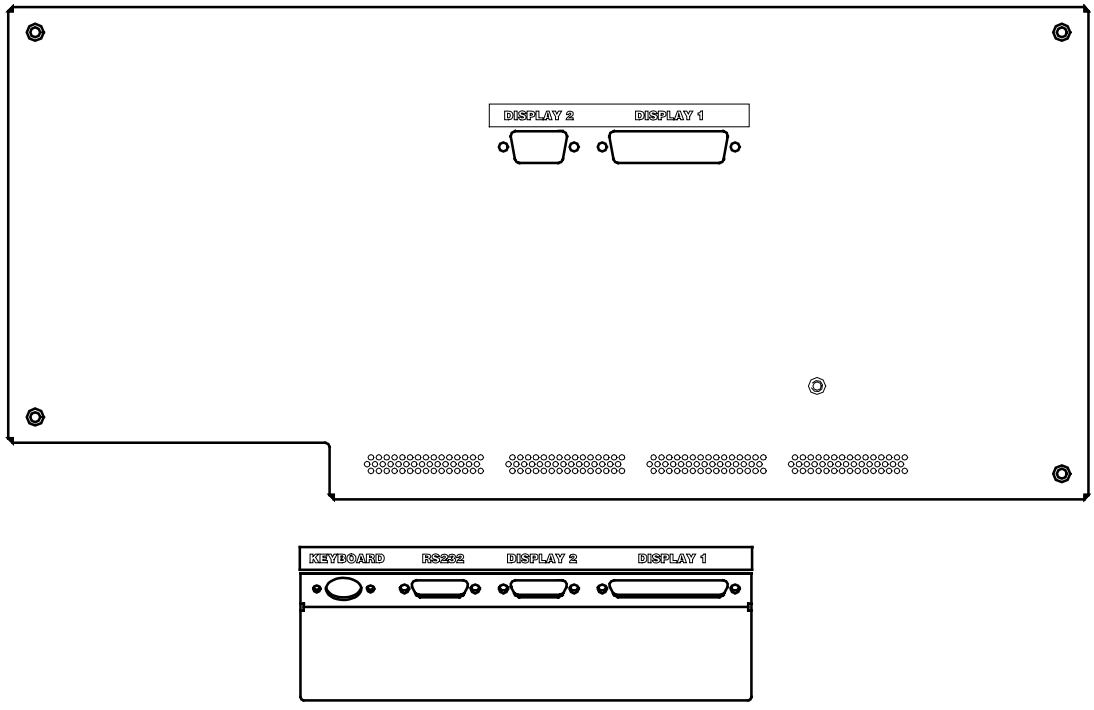
With the system set-up as above any button presses, joystick movements or T-bar movements will control both mainframes simultaneously.

Note Button Bus Multi Control is an option that requires an enabling password. A password is available from Snell & Wilcox technical support.

SYSTEM INTERCONNECTION - *continued*

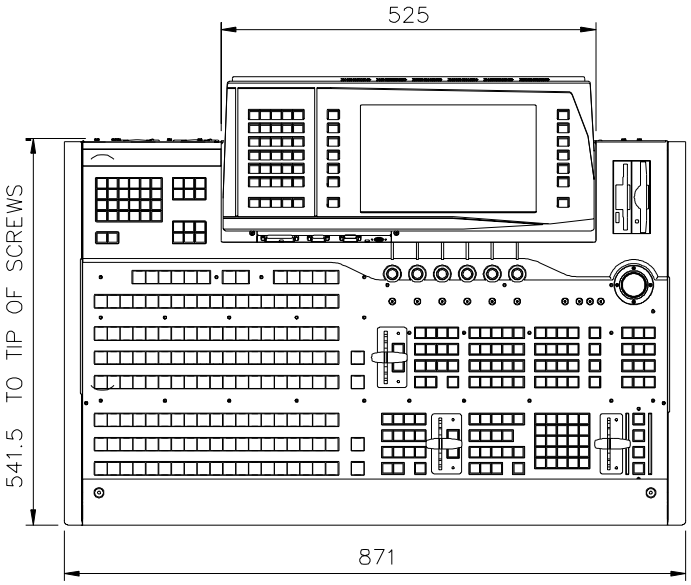


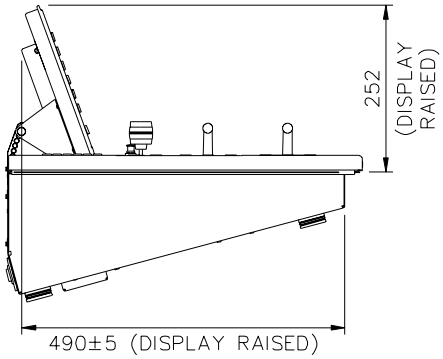
Typical Control Panel, Rear View



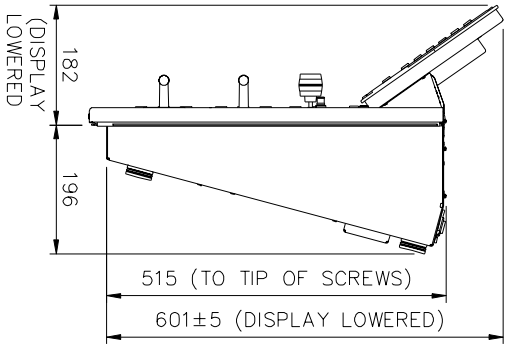
Display and connector panels

SYSTEM INTERCONNECTION - *continued*

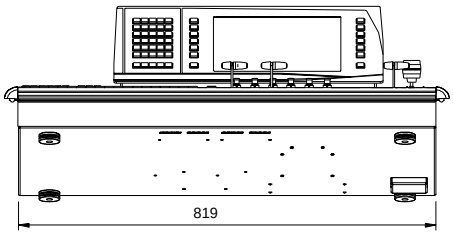




LCD DISPLAY RAISED

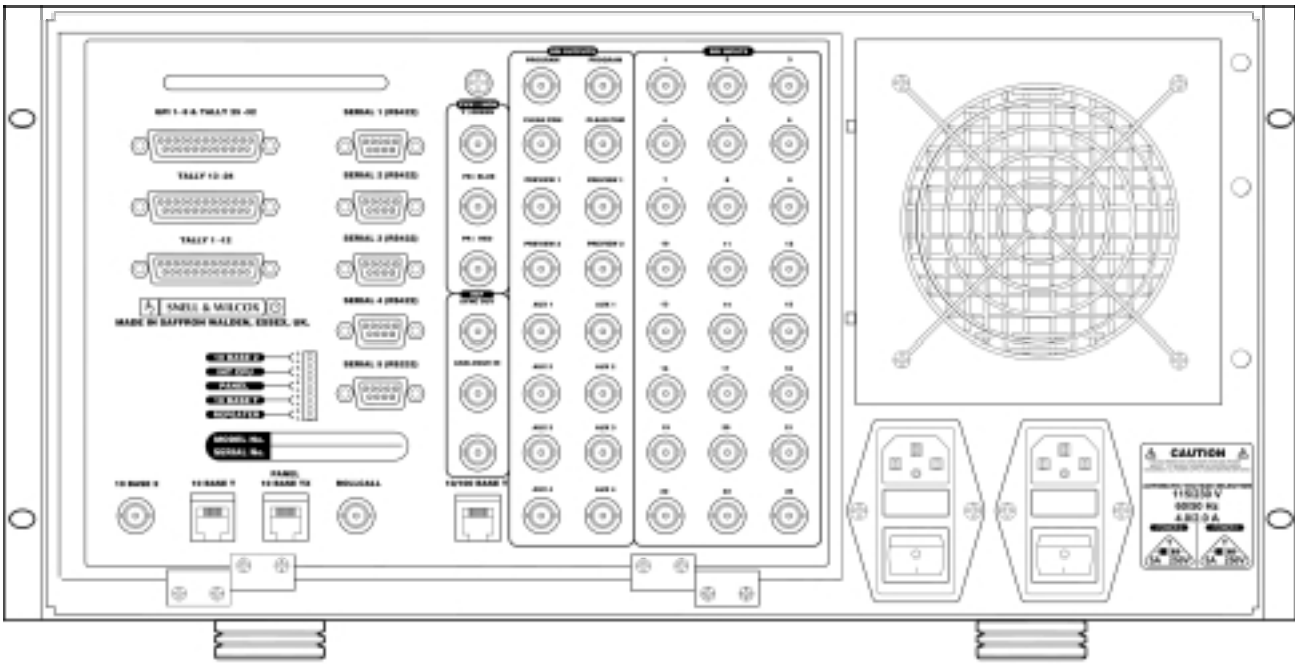


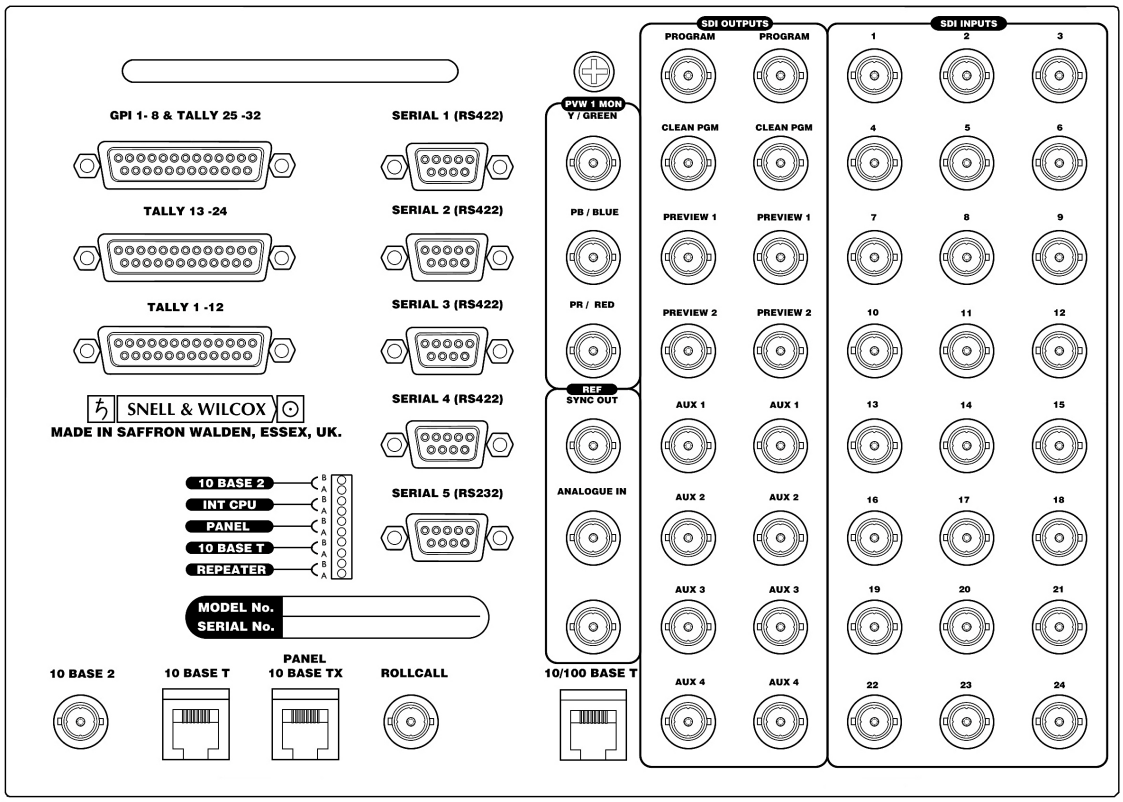
LCD DISPLAY LOWERED



CP1512 Dimensions in mm

SYSTEM INTERCONNECTION - *continued*





SD1000 Switcher Mainframe, Rear Panel

SYSTEM INTERCONNECTION - *continued*

Inputs

Connect up to 24 SDI inputs to the 24 **Serial Inputs** of the Switcher Mainframe. Sources can be either video or key

Outputs

Connect the four outputs **Program**, **Clean Pgm**, **Preview 1,** & **Preview 2** to external equipment or monitoring devices as desired.

Program This is the main program output.

Clean Pgm This is the main program output before the DSK stage.

Preview 1 Preview 1 can be switched between any source, a number of mixing points in the system and transition previews.

Preview 2 Preview 2 is a second preview output with similar capabilities to the first, except that it cannot preview mixer transitions.

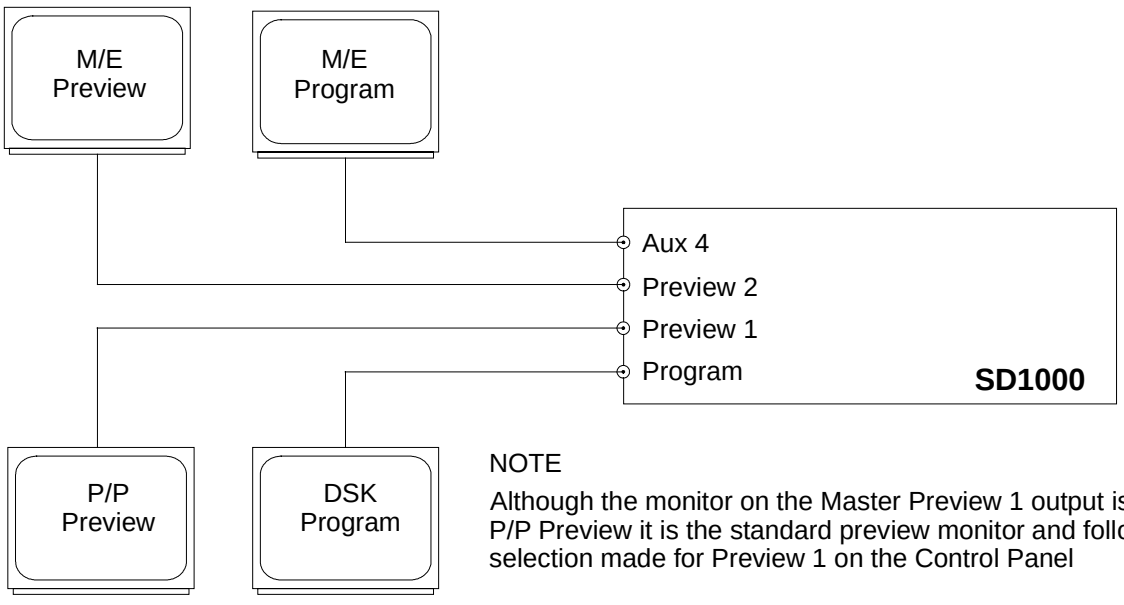
Two copies of each output are available.

The **Preview 1** output is also available in Analogue Component, as either YPbPr or RGB. Whether YPbPr or RGB format is used can be selected in the **Configure - System - Genlock & Outputs** menu. R, G, B and Y outputs have syncs. If the monitor requires separate syncs, the **Ref Sync Out**put can be used if it is not required for system referencing.

Multiple Monitor Set-up

The M/E Program and Preview signals as well as the P/P Preview and the DSK Program may be monitored using four monitors in the set-up in the below diagram.

Note. The set-up shown is only an example of achieving the above, it is not definitive.



NOTE

Although the monitor on the Master Preview 1 output is labelled P/P Preview it is the standard preview monitor and follows any selection made for Preview 1 on the Control Panel

SYSTEM TIMINGS

Referencing

The Switcher can be Genlocked to any of its Inputs or to analogue sync on the **Ref Analogue In** loop-through connectors, selectable from the **Configure-System-Genlock & Outputs** menu.

*Note that the input number set in this menu is absolute and is not remapped through the **Configure-User-Source Mapping** menu.*

If the incoming reference signal is not used elsewhere then the remaining **Ref Analogue In** BNC should be terminated with a 75Ω terminator.

Whether the Switcher Mainframe is acting as the Master SPG for the system or is being Genlocked to an external source, the **Ref Sync Out** BNC provides an adjustably-timed analogue sync output with which to synchronise external sources.

Referencing - Input Timing

Since all inputs have framestore synchronisers, correctly positioned pictures will be obtained even if the sources are free running. However it is recommended that the switcher and source are locked together. This ensures constant video delay through the switcher and avoids missing or repeated frames which will occur every time a source “runs through” a complete frame

There are two methods for referencing the switcher system.

(a) A common ‘station’ sync or black-burst reference is fed to all sources, and to the switcher. This arrangement should be used when same sources are fed to other equipment apart from the switcher. In this case switcher **Genlock** should be **On**, and the **Genlock H/V Phase** controls adjust the timing of the switcher relative to the sources.

(b) The sources are referenced from the **Ref Sync Out**put of the switcher. In this case the timing of the sources is set relative to the switcher by the **Sync H/V-Phase** controls. This arrangement should be used if the switcher is the master reference in the system. It can also be used when the output of the switcher needs to be timed into following equipment; in this case the switcher will is genlocked to a ‘station’ sync or black-burst, and the **Genlock H/V Phase** will move the timing of the switcher output *and* the sources together.

These controls can be found in the **Configure-System-Genlock & Outputs** sub-menu.

Note: the Output Line-Standards must be correctly set before doing this.

SYSTEM TIMINGS - *continued*

Referencing - System Delays

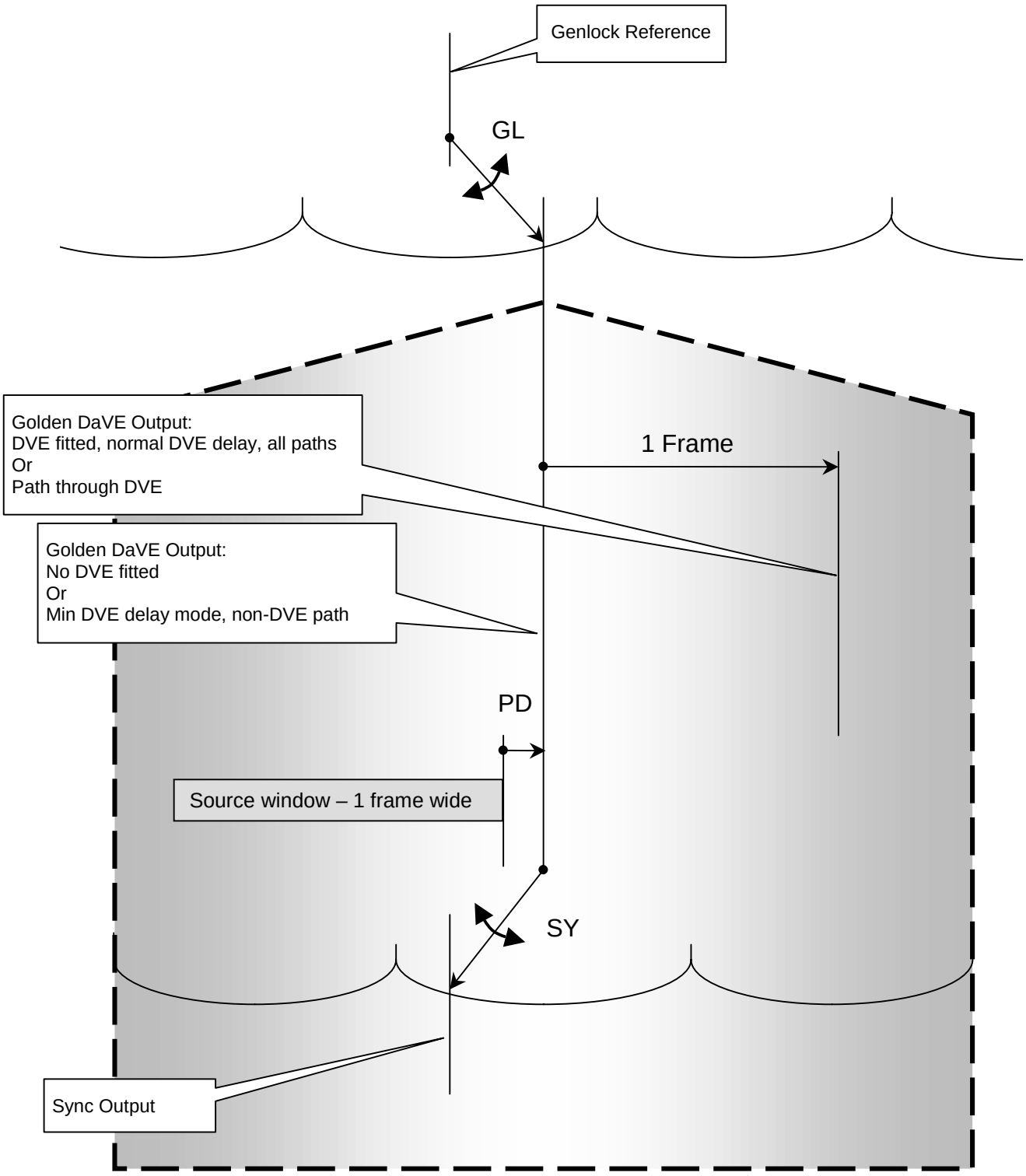
The delay through the Golden DaVE system is illustrated in the timing diagram on the next page. With no option (OPT) card the minimum delay which is possible is 185 pixels (about 14µs), but as the diagram shows, with a DVE card fitted a delay of over 2 frames is easily achievable!

Because all inputs have frame synchronisers, a source cannot be set outside the source window; if a source is delayed (shifted to the right) beyond the end of the window, the whole diagram moves one frame to the right, so the source is now at the left hand edge of the window, and the input synchroniser is inserting a frame of delay.

To minimise lip-sync problems, it is usually preferred to minimise the delay through a switcher. If the OPT card is fitted, the desired **Border Gen Delay** must be set in the **Configure-System-System Delays** sub-menu, before making timing adjustments since it affects the processing delay. Refer to the User Manual.

For example if the **Border Gen Delay** is set to 10 lines, the processing delay will be 10 lines + 33us. If the sources are set 11 lines in advance of the output, this will allow for the processing delay. The sources will be at the right hand end of the source window in the diagram, and the delay through the input synchronisers will be 64 - 33 = 31us. If the switcher and sources are locked to a common reference (method (a) above), set the **Genlock V Phase** to 11 to achieve this. If the sources are genlocked to the **Ref Sync Out**put of the switcher (method (b) above), set the **Sync V-Phase** control to 11 lines advance: 625 - 11 = 614 in 625-line standards or 525 - 11 = 514 in 525-line standards. If the DVE option is fitted the delay will now be 1 frame +11 lines. It can be reduced to 11 lines for paths which do not pass through a DVE by setting the **DVE Delay** in the **Configure-System-System Delays** sub-menu to minimum; in this case there will be a time jump when a DVE is selected or de-selected.

SYSTEM TIMINGS - *continued*



GL	Genlock H and V Phase	Fully adjustable +/- 1 field
SY	Sync H and V Phase	Fully adjustable +/- 1 field
PD	Processing Delay (no OPT card)	~14us
	Processing Delay (with OPT card)	~33us to Border Delay + 33us

Time

SYSTEM TIMINGS - *continued*

Switcher Timing for VTR Pre-Read

Introduction

Pre-read is a facility of some VTRs which allows video information to be read from the tape, be processed by some external equipment and then written back to the tape in the same place as it was read from. This process allows tape to tape editing to be carried out using only two VTRs instead of the normal three.

Processing delay

The processing equipment will delay video passing through it by some amount of time. This delay must be less than the maximum delay which can be accommodated by the pre-read VTR. Different makes and models of VTR have different maximum delay capabilities, refer to the VTR manufacturer for this information.

The processing delay of a Golden DaVE switcher is dependant on how it is set-up. Absolute minimum delay is 14u sec with no option card fitted, or 33u sec with the OPT card fitted but with no Border Gen delay set. The maximum Border Gen delay which can be set is 20 lines, making the maximum delay through a Golden DaVE switcher, **with no DVE,** 1313u sec.

Setting Golden DaVE

How Golden DaVE can be set and used depends on the delay handling capabilities of the pre-read VTR being used. If the VTR can accept a delay of 21 lines, or more, the full Colour Correction, Chroma Keying and Border Generation facilities of Golden DaVE can be used.

Note **DVE cannot be used with pre-read as the delay produced by the DVE function is one full frame.**

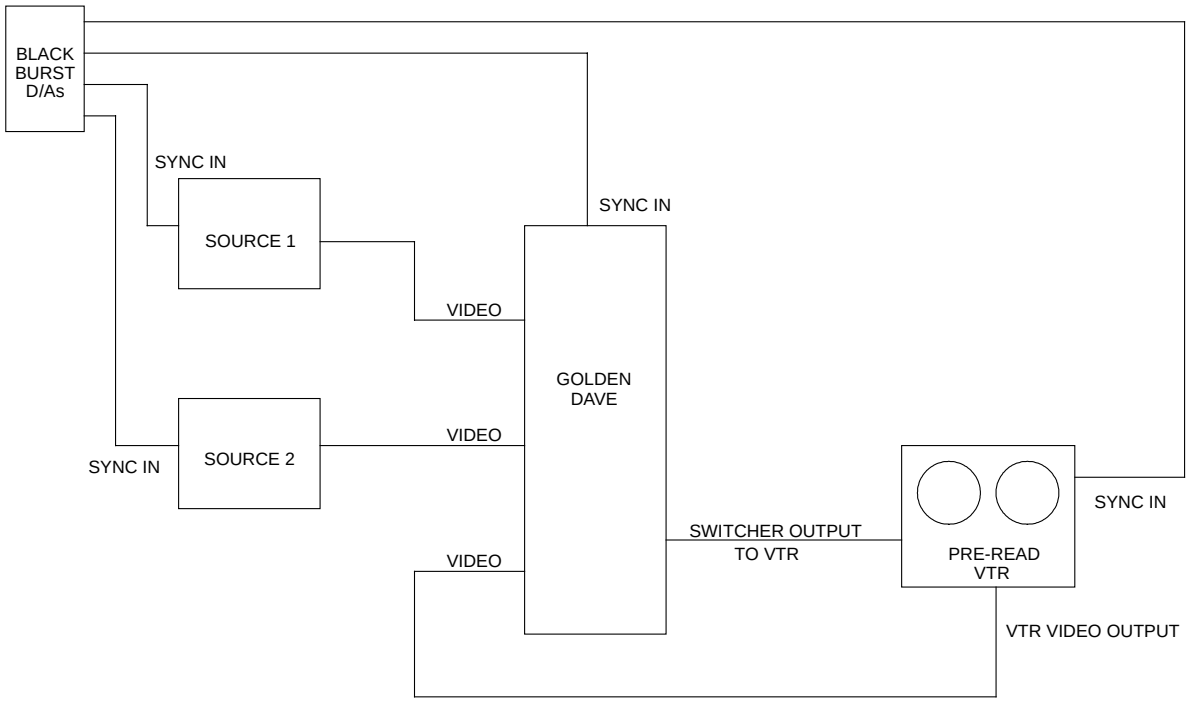
There are two standard methods of synchronising the video sources, switcher and VTR(s) which are shown in diagrams on the next page, these methods are:-

a) Sync everything to studio black burst reference. In this case the Genlock Phase of the switcher should be set to a positive value anywhere between the actual delay of the switcher and the maximum delay the pre-read VTR can accommodate.

b) Use the sync O/P reference of the switcher to synchronise the sources and VTR(s). In this case the switcher sync output Sync Phase should be set to a negative value anywhere between the actual delay of the switcher and the maximum delay the pre-read VTR can accommodate.

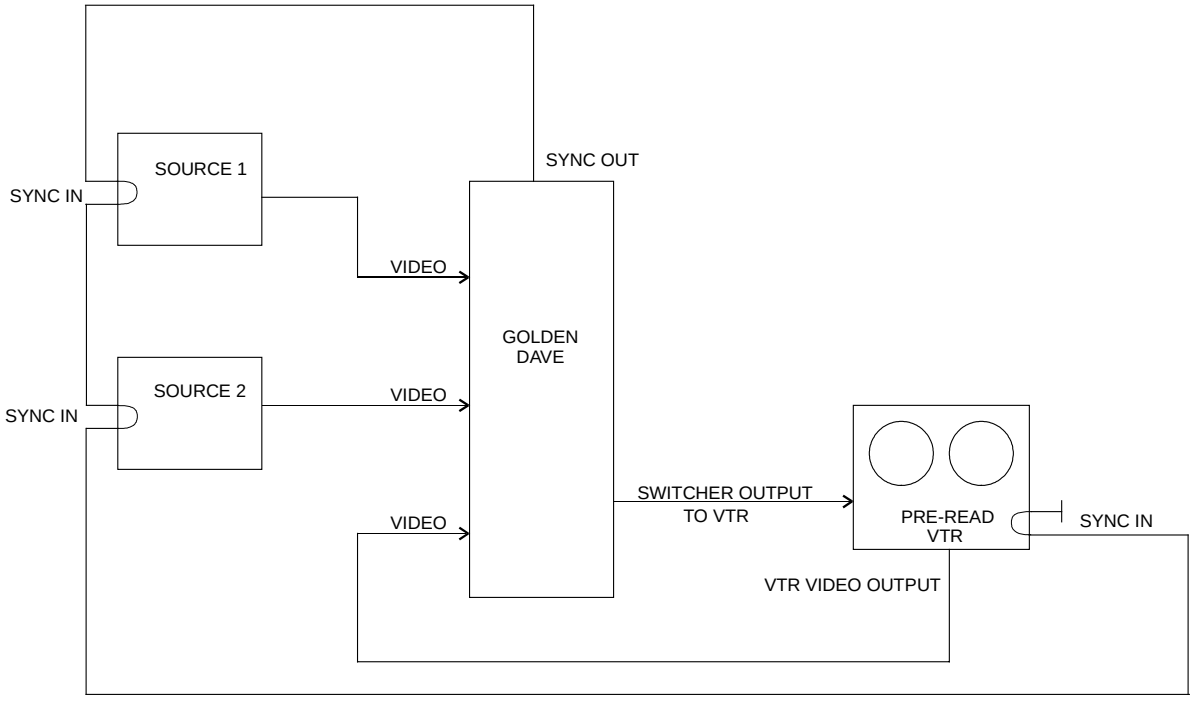
Note Ensure that the VTR(s) is/are set-up to be synchronised to the external sync reference and not to the video on the tape!

SYSTEM TIMINGS - *continued*



Studio Black Burst Synchronisation.

Set the “Genlock V or H Phase” in the “Configure - System Genlock” menu to a positive value anywhere between the actual delay of the switcher and the maximum delay the pre-read VTR can accommodate.



Synchronisation to Switcher Ref Sync Out

Set the “Sync V or H Phase” in the “Configure - System Genlock” menu to a negative value anywhere between the actual delay of the switcher and the maximum delay the pre-read VTR can accommodate.

CONTROL PORTS AND PROTOCOLS

Ports

The Switcher Mainframe has Ethernet, Serial and Tally & GPI I/O ports.

The Ethernet ports are used for connection between the mainframe and the control panel, to connect to an alternate mainframe and for FTP connection to provide the transfer of Stills.

Serial Ports 1 to 4 are RS422 ports and can be assigned a communications protocol in order to communicate with number of external devices. Serial Port 5 (RS232) is for diagnostic purposes only. The protocols used by the serial ports (1 to 4) are assigned in the **Configure - System - Port Protocols** sub-menu (see User Manual). For most applications a simple 9-way pin-to-pin cable will be sufficient to connect to an editor, VTR or other device.

32 Tally outputs and eight assignable GPI inputs are provided on the 3 off 25way D-type connectors.

FTP - Connecting to a PC

A computer may be either connected directly to the switcher mainframe or via a network hub.

If connecting directly use a cross wired (swap) Ethernet cable to connect a computer network card to the 10 Base-T connector on the rear of the switcher mainframe.

If connecting via network hub use a standard (pin to pin) Ethernet cable from the hub to the switcher mainframe 10 Base-T connector.

GVG 100

This editor protocol allows control from an editor capable of driving a GVG100 or 110 switcher.

The main portion of the interface is mapped onto the SD1512's main mixing bus. The DSK and Fade-to-Black sections are also driven.

Wipe numbers 100 to 103 trigger the following functions:

100 - Non Additive Mix.

101 - SUPERmix.

102 - DVE BacKGrounD transition.

103 - All enabled TIMELINEs.

Note that not all editors will allow a wipe number of greater than 99 to be specified when running GVG-100 protocol. In particular on the Sony BVE9x0 and BVE9x00 editors a wipe number greater than 99 means "Reverse Wipe". However on the Sony BVE2000 editor negative numbers are used to mean "Reverse Wipe" and therefore wipe numbers of 100 or greater can be used.

Learn and Recall of DMEMs (E-MEMS) to and from the hard disk in the switcher is supported.

GVG 4000

This protocol allows an editor capable of controlling a GVG 3000 or 4000 switcher to drive the P/P bus of the Switcher. Learn and Recall of DMEMs (E-MEMS) to and from the hard disk in the switcher is supported. The protocol also supports transfer of DMEMS and Timelines to and from the editor, and running of Timelines from the editor. Editors capable of driving the GVG 2200 series should also work with this interface

The P/P is driven by the M/E-1 part of the protocol and the DSK section is driven by the DSK-1 part of the protocol.

Controlling the PVW bus from the Editor controls the switcher's PVW 1 bus.

Controlling AUX 1 from the Editor controls the switcher's PVW 2 bus.

Controlling AUX busses 2 to 9 from the Editor controls the switcher'sAUX 1 to 4 busses.

When setting areas of the switcher to Learn/Recall/Transfer DMEMs or run Timelines, the protocol's BKGD area will drive the switcher's SOURCES DMEM/Timeline Enable, and the protocol's MISC area will drive the switcher's GLOBAL DMEM/Timeline Enable.

The crosspoint assignment is as follows:

Editor Crosspoint	Switcher Crosspoint
0	Black
1	Black
2	Crosspoint 1
:: ::	:: ::
25	Crosspoint 24
26	Still 1
27	Still 2
28	Still 3
29	Still 4
30	Wash
31	Matte
32 to 48	Unused
49 to 51	M/E O/P
52	PGM OUT (PVW & AUX busses only)
53 to 55	M/E PVW (PVW busses only)
56	DSK PVW (PVW busses only)

Wipe numbers 100 to 103 trigger the following functions:

100 - Non Additive Mix.

101 - SUPERmix.

102 - DVE BacKGrounD transition.

103 - All enabled TIMELINEs.

CONTROL PORTS AND PROTOCOLS - *continued*

There are three variants of the GVG-3000/4000 Protocol. They are identical except for the way that Aux and Preview busses are assigned. The bus name in brackets in the protocol setting is the switcher bus that is driven by the incoming AUX 1 bus controls. In detail the bus assignments are as follows:

Protocol Setting	Incoming bus (in **Bold**) from editor will drive:				
	Aux 1	**Aux 2–8**	**Aux 9**	**PVW**	**MASK**
"GVG-4000 (AUX 1)"	Aux 1	Aux 2–8	-	PVW 1	PVW 2
"GVG-4000 (PVW 1)"	PVW 1	Aux 1–7	Aux 8	PVW 2	-
"GVG-4000 (PVW 2)"	PVW 2	Aux 1–7	Aux 8	PVW 1	-

Therefore when driven from an editor that follows the convention of using AUX 1 for the Edit Preview Bus, the bus named in the protocol setting will be the Edit Preview Bus. (For editors, such as the Sony BVE-9000 series, that use the PVW bus for the Edit Preview Bus, this will not be the case).

SONY DVS

Learn and Recall of DMEMs (E-Files) to and from the hard disk in the switcher is supported, as is the transfer of DMEMs (E-Files) to and from the editor's EDL.

There are three variants of the Sony DVS Protocol. They are identical except for the way that Aux and Preview busses are assigned. The bus name in brackets in the protocol setting is the switcher bus that is driven by the incoming AUX 1 bus controls. In detail the bus assignments are as follows:

Protocol Setting	Incoming bus (in **Bold**) from editor will drive:			
	Aux 16	**Aux 1**	**Aux 2 - 7**	**AUX 8**
"Sony DVS (AUX 1)"	Aux 1	Aux 2	Aux 3 - 8	-
"Sony DVS (PVW 1)"	PVW	Aux 1	Aux 2 - 7	Aux 8
"Sony DVS (PVW 2)"	-	Aux 1	Aux 2 - 7	Aux 8

Since Aux 16 is the Edit Preview Bus, the bus named in the protocol setting will normally be the Edit Preview Bus.

Wipe numbers 100 to 103 trigger the following functions:

100 - Non Additive Mix.

101 - SUPERmix.

102 - DVE BacKGrounD transition.

103 - All enabled TIMELINEs.

CONTROL PORTS AND PROTOCOLS - *continued*

Sony DVS crosspoint allocation is shown in the table below. When a source can be accessed via two or more different values, the value returned on a status request is marked with an asterisk

Dec	Hex		S&W Source Selected	Sony Name
00	00	*	Black	Crosspoint 0
01	01		Crosspoint 1	Crosspoint 1
02	02		Crosspoint 2	Crosspoint 2
::	::		::	::
24	18		Crosspoint 24	Crosspoint 24
48	30	*	Alias of 64/40 (OFF)	Crosspoint 48
49	31		Alias of 65/41 (BLACK)	Crosspoint 49
50	32	*	Alias of 66/42 (BACK COLOR 1)	Crosspoint 50
51	33	*	Alias of 67/43 (BACK COLOR 2)	Crosspoint 51
52	34	*	Alias of 68/44 (BACK COLOR 3)	Crosspoint 52
53	35		Alias of 71/47 (PGM OUT)	Crosspoint 53
54	36		Alias of 72/48 (CLEAN FEED)	Crosspoint 54
55	37		Alias of 73/49 (EFF 1 OUT)	Crosspoint 55
56	38		Alias of 74/4A (EFF 2 OUT)	Crosspoint 56
57	39		Alias of 82/52 (PST OUT)	Crosspoint 57
58	3A		Alias of 83/53 (EFF 1 PVW OUT)	Crosspoint 58
59	3B		Alias of 84/54 (EFF 2 PVW OUT)	Crosspoint 59
60	3C	*	Alias of 90/5A (Still 1)	Crosspoint 60
61	3D	*	Alias of 91/5B (Still 2)	Crosspoint 61
62	3E	*	Alias of 92/5C (Still 3)	Crosspoint 62
63	3F	*	Alias of 93/5D (Still 4)	Crosspoint 63
64	40		Background OFF (M/E bus only)	OFF
65	41		Black (all but HD AUX busses)	BLACK
66	42		Matte (all but HD AUX busses)	BACK COLOR 1
67	43		Wash (all but HD AUX busses)	BACK COLOR 2
68	44		-	BACK COLOR 3
69	45		-	-
70	46		-	-
71	47	*	PGM OUT (PVW & AUX busses only)	PGM OUT
72	48	*	CLEAN OUT (PVW & AUX busses only)	CLEAN FEED
73	49	*	M/E OUT (P/P, PVW & SD AUX busses)	EFF 1 OUT
74	4A	*	CLEAN OUT (HD AUX busses)	EFF 2 OUT
75	4B		BGND OFF (M/E bus)	EFF 3 OUT
82	52	*	P/P PVW (PVW busses only)	PST OUT
83	53	*	M/E PVW (PVW busses only)	EFF 1 PVW OUT
84	54	*		EFF 2 PVW OUT
85	55			EFF 3 PVW OUT
90	5A		Still 1 (all but HD AUX busses)	FRAME MEMORY 1
91	5B		Still 2 (all but HD AUX busses)	FRAME MEMORY 2
92	5C		Still 3 (all but HD AUX busses)	Chromakey Fill 1
93	5D		Still 4 (all but HD AUX busses)	Chromakey Fill 2
94	5E		-	Chromakey Source 1
95	5F		-	Chromakey Source 2

Using a Sony BVE-9100 editor

There is a fairly common problem when using the BVE-9100 editor and S & W switchers whereby the switcher appears to be acting slightly too late on commands coming from the editor (or, that the editor is sending commands slightly too late for the switcher).

The problem is easily overcome by a setting on the editor.

If, when running the SD1008 switcher from a Sony BVE-9100 editor, the edit timing appears to be inaccurate, please follow this procedure.

Determine how many fields late (if any) the switcher is switching is as follows.

1. Using the editor perform a one-second Key Cut On transition with a Key Delay of one frame. (This forces the editor to actually cut the key on "live" during the edit interval rather than during the preroll.)

2. Examine the start of the edit field-by-field. You should get two fields (one frame) of the new source without the key, then the key should appear on the third field of the edit interval.

Obviously this assumes that the recorder is correctly timed. However if you use a tape with burnt-in timecode you should be able to prove the switcher timing regardless of the recorder's timing (and you should also be able to check the recorder's timing too).

The most common problem (when running Sony BVS/DVS protocol with HD) is that the switcher is acting one field too late, i.e. there are 3 clear fields of new material before the key is cut on over the top of it.

To fix this, the BVE-9100 editor's switcher command transmit timing needs to be adjusted. This adjusts how much in advance the BVE-9100 sends commands to the switcher.

DATA-5 in the IDC Serial Switcher Interface screen (known as "TRANSMIT INTERVAL OFFSET") does this. Despite the fact that it's about the only item on that screen that doesn't say "[BY QUARTER FIELD]", it IS in quarter-field steps. So, for example, to compensate for a one FRAME (two fields) flash you need to set it to 08.

To adjust this setting on the BVE-9100 step-by-step:

1. Press Shift-Setup.
2. Press F3 IDC.
3. Cursor down to the SW/MON entry in the IDC list
4. Press F8 ENTRY.
5. Press F3 SERIAL IF SW'ER
6. Cursor down to DATA-5 ("TRANSMIT INTERVAL OFFSET")
7. Type in the new value required.
8. Press RET to exit the screen, saving the value. (F8 EXIT leaves the screen but does NOT save the value.)
9. Press RET three more times to go back to the main screen.

The new value required should be determined by the Key Cut On test as described above, but these are values we have found to be suitable in our testing.

with Sony BVS/DVS protocol:	(min delay mode)	02 to 05 inclusive
with Sony BVS/DVS protocol:	(normal mode)	10 to 13 inclusive
with GVG-4000 protocol:	(both modes)	00 to 02 inclusive
with GVG-100 protocol:	(min delay mode)	00 approx.
with GVG-100 protocol:	(normal mode)	08 approx.

VTR

Using the Sony VTR (P2) protocol, the Switcher emulates, specifically, a Sony BVH-2000. The timeline is treated as length of videotape in a virtual VTR controlled by the protocol.
There are two variants of this protocol: **VTR-Ballistics** and **VTR-No B'stics**. The difference is that on reception of a Preroll (0x20, 0x30) or Cue-Up-With-Data (0x24, 0x31) command, the "Ballistics" version will jump to one second away from the desired timecode, then slowly roll up to it and stop. The "No B'stics" version will jump to the desired timecode immediately. The latter mode is quicker, but may confuse editors that do not expect one-inch tape decks to be so athletic!
To enable this function to operate, **F1R Time Touch** must be **On** in the main **TIMELINE** menu.

Follow Real VTR

This protocol allows the switcher's timeline to follow the tape motion of a real VTR, or indeed any device supporting Sony VTR (P2) protocol. This allows, for example, a switcher timeline to be built that has different colour-correction settings for each scene on a tape.
To enable this function to operate, **F1R Time Touch** must be **On** in the main **TIMELINE** menu.
There are two ways of using this protocol.

1 The switcher emulates an editor (it becomes a controlling device) and locks the switcher's timeline to timecode it requests from the VTR.

In this case, simply plug a normal pin-to-pin 9-pin cable between the designated port on the switcher and the remote port of the VTR.

2 Alternatively in a system that has an editor (or other controlling device) connected to the VTR, a special "sniffer" arrangement is inserted into the control cable between the editor and the VTR. This allows the switcher to monitor the timecode replies transmitted from the VTR to the editor, while preventing the switcher's timecode requests clashing with those from the editor. Note: this method relies on the editor transmitting timecode requests to the VTR. Most editors do this at least once a field; however some designs only transmit such requests once every few fields. This interface will not work as well with such editors.

The special connector arrangement required is as follows:

To Editor (or VTR)			To VTR (or Editor)			To Switcher's "Follow Real VTR" port	
9-way female D-Type			9-way male D-type			9-way female D-type	
Function	Pin		Pin	Function		Pin	Function
Frame Ground	1	----------	1	Frame Ground	----------	1	Frame Ground
Rx A	2	----------	2	Tx A	----------	2	Rx A
Tx B	3	----------	3	Rx B	-- CUT --	3	Tx B
Tx Common	4	----------	4	Rx Common	-- CUT --	4	Tx Common
[Unused]	5		5	[Unused]		5	[Unused]
Rx Common	6	----------	6	Tx Common	----------	6	Rx Common
Rx B	7	----------	7	Tx B	----------	7	Rx B
Tx A	8	----------	8	Rx A	-- CUT --	8	Tx A
Frame Ground	9	----------	9	Frame Ground	----------	9	Frame Ground

The left-hand two connectors form a transparent loop-through between the editor and the VTR, and can be connected either way round. The right-hand connector should be plugged into a cable leading to the switcher.

CONTROL PORTS AND PROTOCOLS - *continued*

S & W Tally

This protocol transmits detailed tally information every field for use by external intelligent tally systems. The protocol used is specific to Snell & Wilcox, and details are available on request.

S & W Router & S & W Router No Aux

For use with Snell & Wilcox HD1132 router.

Remote Panel 8 & Remote Panel 16

Allows remote control of M/E 1 on 2.5M/E & 3M/E Switchers using a CP8 or CP16 panel.

Aux Control Quartz & Aux Control ProBel

Allows remote source allocation of the Aux outputs using a Quartz or ProBel remote panel.

Probel TX320 & DVE

These are proprietary protocols.

BBC Camera

This is a proprietary protocol for use with virtual studio software.

Button Bus

The address code of the pressed control panel button is sent from the applicable port.

B-Bus Multi Ctl

Allows one control panel to control two mainframes in parallel, i.e., a SD & HD system.

P-Bus

Allows up to 32 RS-485 devices to be strung off a port and triggered independently.

Router Protocols

Allows a variety of third party Integrated and/or Pre-Selecting routers to be used with the SD1524. Select the appropriate control protocol for a Pre-Select router (if used) and the Integrated router (if not the S&W HD1132) from the available router protocols, see table below.

Router Model	Protocol for Integrated use	Protocol for Pre-Selecting use
Pro-Bel SD Eclipse	ProBel Router	Pre ProBel Rtr
Pro-Bel SD Freeway	Fast Simple Rtr	Pre ProBel Rtr
PESA Jaguar SD	N / A	Pre PESA Rtr
PESA Tiger SD	N / A	Pre PESA Rtr
PESA Cheetah SD	N / A	Pre PESA Rtr
PESA Cougar SD	N / A	Pre PESA Rtr
NVision SD series	N / A	Pre NVision Rtr
Quartz SD series	Simple Router	Pre Quartz Rtr

GENERAL PURPOSE INPUTS & OUTPUTS

OVERVIEW

Standard System

The switcher mainframe has eight general purpose inputs and 32 outputs. The action of each of these inputs and outputs may be allocated by the user from a range of functions. The allocation is performed in the GPI and GPO menus.

Quad DSK (option)

Where a Quad DSK unit is fitted a further eight general purpose inputs are available, the functions of which may also be determined by the user.

Note

There are eight fixed Tally outputs available on the Quad DSK.

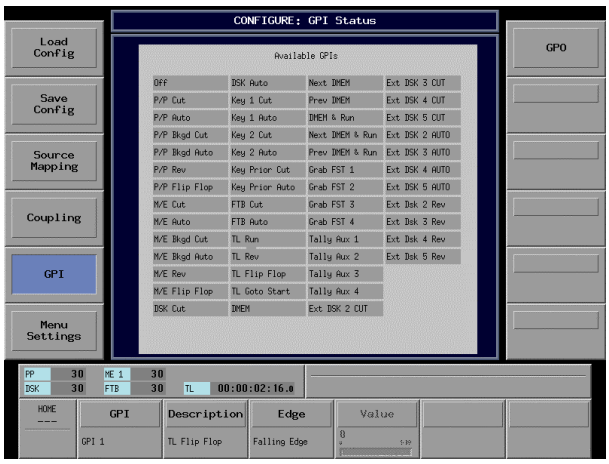
The Inputs

The general purpose inputs, eight or sixteen, are user programmable in the “Configure - User - GPI” menu. (Systems without the Quad DSK option have eight inputs and systems with Quad DSK have sixteen inputs).

Each input may be independently set to trigger a function when an edge or level is applied to the input connector pin.

The available functions depend on the type of control panel being used and whether the Quad DSK option is fitted.

The GPI menus and avalable GPI functions, with Quad DSK (right) and without are shown below.



There are twelve functions applicable to the external quad DSK unit as depicted in the right hand menu above.

Note

The first eight inputs are on the GPI & Tally connector (25 way D-type) on the rear of the mainframe. The second eight are on the GPI & Tally connector (25 way D-type) on the rear of the Quad DSK unit.

CONTROL PORTS AND PROTOCOLS - *continued*

The Outputs

There are thirty-two general purpose outputs, located on the three Tally connectors (25 way D-type) on the rear of the switcher mainframe. Each output may be independently programmed to “indicate” any one of a wide range of occurrences or combinations of occurrences. These occurrences fall into five groups (six if the Quad DSK option is fitted) which are detailed below.

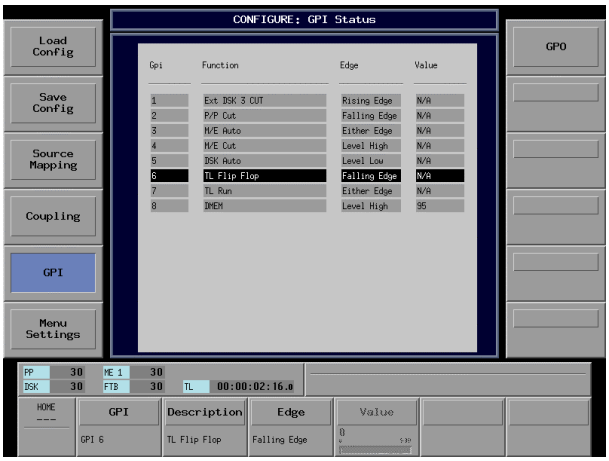
Video Tally	Each output may be set to Tally any one of the video inputs.
Bus Tally	The use of a particular bus may be tallied.
Trans Running	The transitions, Fade to Black, Program / Preset, DSK or M/E are tallied. If the Quad DSK option is fitted the four external DSK transitions may be tallied.
T/L Running	A particular timeline may be tallied, including those of an external DSK, where fitted. Also a Tally may be generated if any timeline is running.
T/L User Bits	Six “flag” bits are available which can be linked to specific keyframes on specific timelines. These bits may be used as tallies.
Ext DSK Tally	The background, key fill and key cut signals of the four (option) external DSKs may be tallied.
Key Action	Triggers fired from a Skateboard or via a Key Macro.

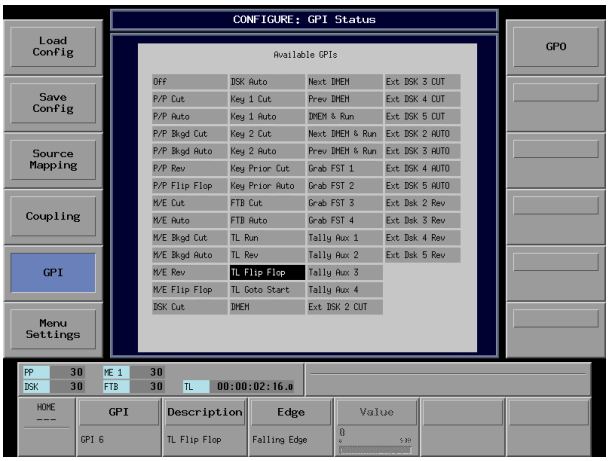
Note — A complete list of all of the “occurrences” which may be tallied on the General Purpose Outputs (GPO) is on page 29.

CONTROL PORTS AND PROTOCOLS - *continued*

Programming The Inputs

The GPI functions are programmed in the GPI menu found under the Configure - User menu.



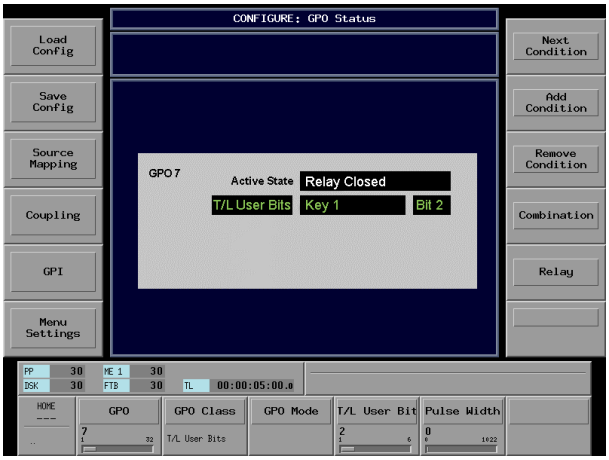


The left screen shows the, standard, eight GPIs with their allocated function and which edge or level of the control signal will trigger the function. The rotary controls are used to set the parameters. The leftmost one steps through the GPIs, the third from left selects the edge or level and the rightmost sets the value. Value only applies to functions with DMEMs and is the number of the required DMEM.

The second from left rotary control allocates the function to the GPI. When it is rotated the menu screen changes to that on the right. This menu displays all the available functions and the rotary control steps through them. When the required function is highlighted release the rotary control and the menu will return to that on the left with the selected function allocated to the selected GPI.

Programming The Outputs

The GPO functions are programmed in the GPO menu which is accessed from the GPI menu by F1R.



The rotary controls are used to set the parameters.

Conditions

The leftmost control (GPO) selects the GPO, the next one (GPO Class) selects the “occurrence group” and GPO Mode selects the actual occurrence.

If T/L User Bits is set as the GPO Class the rotary control “T/L User Bits” selects the actual bit (1 to 6) to be flagged.

The rotary control “Pulse Width” determines the time that the output relay is activated.

Active State

The active state of the output relay may be set as “Closed” or “Open” by F5R (Relay) which toggles between open and closed.

CONTROL PORTS AND PROTOCOLS - *continued*

Multiple Conditions

The GPO active state may be conditional on more than one occurrence.

The rightside buttons F1R to F4R set-up the conditions and the way they combine to produce an active output.

F2R Add Condition

Pressing this button adds another condition to the original single condition. One or two extra conditions may be added. When a second condition is added they are titled Cond 1 and Cond 2, another addition becomes Cond 3.

F1R Next Condition

When there are two or three conditions this button is used to step through them. The active one has green text whereas the other(s) have white.

F3R Remove Condition

This button removes the currently active condition and renumbers the others if neccessary.

Each condition is programmed independently of the others. Select the condition with F1R and use the rotary controls as detailed previously.

Combining Conditions

The GPO will be active when the combination of conditions conforms to a specified state. The combination state is selected by F4R (Combination) which steps through those available.

For two conditions the states are [C1 and C2] or [C1 or C2].

With three conditions there are four available states they are: [C1 and C2 and C3], [C1 or C2 or C3], [(C1 and C2) or C3] or [(C1 or C2) and C3].

CONTROL PORTS AND PROTOCOLS - *continued*

List of GPO occurrences

The following is a complete list of the system occurrences which may be assigned to a GPO.

Note	This list includes the occurances applicable to the Quad DSK unit. If this option is not fitted ignore any reference to Ext DSK.
Video Tally	Source inputs 1 to 32.
Bus Tally	Program Bus, Preset Bus, DSK Fill Bus, DSK Key Bus, M/E Background A Bus, M/E Background B Bus, M/E Key 1 Fill Bus, M/E Key 1 Key Bus, M/E Key 2 Fill Bus, M/E Key 2 Key Bus.
Transition Running	Fade to Black, Program / Preset, DSK, Mixer / Effects, Ext DSK 2, Ext DSK 3, Ext DSK 4, Ext DSK 5.
Timeline Running	Key 1, Key 2, M/E, M/E Background DVE, DSK, P/P, P/P Background DVE, Source Setup, Global, Ext DSK 2, Ext DSK 3, Ext DSK 4, Ext DSK 5, Any.
Timeline User Bits	Each of User Bits 1 to 6 may be linked to any one of the following - Key 1, Key 2, M/E, M/E Background DVE, DSK, P/P, P/P Background DVE, Source Setup, Global, Ext DSK 2, Ext DSK 3, Ext DSK 4, Ext DSK 5.
Ext DSK Tally	Ext DSK 2 Background, Ext DSK 2 Fill, Ext DSK 2 Key, Ext DSK 3 Background, Ext DSK 3 Fill, Ext DSK 3 Key, Ext DSK 4 Background, Ext DSK 4 Fill, Ext DSK 4 Key, Ext DSK 5 Background, Ext DSK 5 Fill, Ext DSK 5 Key.
Key Action	Skateboard Triggers 1 to 8. These may be directly fired from a Skateboard button or set as part of a Key Macro.

OTHER INSTALLATION PROCEDURES

Setting the Real-Time Clock

It is recommended that you set the Real-Time Clock at installation time. To do this, press the CONFIG MENU button, then press **F2L User** and then **F4L More** until **F3L** is **Set Clock,** press this button. **F1L** & **F2L** select **Date** and **Time**, adjust the rotary controls along the bottom of the screen to the desired date & time values. When ready, press the **F4R Set Clock** button.

There is no automatic correction for Daylight Saving Time - in areas where DST is implemented the clock will have to be manually adjusted twice a year.

For more details about this menu, see User Manual.

System Reboot

If required, the system can be rebooted without powering off and on. This can be done using the **System Reboot** button in the **Misc – Factory Reset** menu.

Alternatively, hold down the four FTB buttons (FTB ENABLE, TIME, CUT & AUTO) at the right-hand end of the control panel at the same time as the DSK, Program & Preset bus BLACK buttons at the left-hand end of the control panel. Keep these buttons held down, and after five seconds all buttons will light green for two seconds, then amber for two seconds, then red for two seconds (all times approximate). They will then all extinguish and the system will reboot.

No stored data (DMEMs, stills, configs, etc.) will be lost as a result of this process.

System Settings

Following installation of the switcher system, settings of television standard, genlock etc *will not automatically be remembered when the system is switched off*.

To set the state on power up, save the current state as System 000 in the **Config-System-System Save** menu. Settings such as source remapping and key associations should be saved as Config 000 in the **Config-User-Save Config** menu. For full details refer to the User Manual.

REMOTE ALLOCATION OF AUX SOURCES

The switcher auxiliary outputs may have their sources allocated from one or more remote panels rather than from the switcher control panel. Snell & Wilcox do not manufacture a panel for this function but the Quartz Electronics CP3201 - S7 Remote Panel or the Pro-Bel 6706 panel can be used as described below.

Pro-Bel panels

The Pro-Bel 6706 control panel may used to switch signal sources to the switcher auxiliary outputs from a location remote from the switcher control panel.

The picture below shows the Pro-Bel 6706 panel and the table below that shows the button allocation.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Black	Pvw 1	Pvw 2	Aux 1	Aux 2	Aux 3	Aux 4	Store 1	Store 2	Matte
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	Pf Cln	Pf Pgm	Pgm	Aux 5	Aux 6	Aux 7	Aux 8	Store 3	Store 4	Wash

Panel set-up

The DIL switches must be set to the following positions.

1	2	3	4	5	6	7	8
OFF	OFF	OFF	ON	OFF	OFF	OFF	ON

The Panel Address rotary hex switch selects which Aux output will be controlled by the panel as detailed below.

1 = Aux Bus 1 source selection. 5 = Aux Bus 5 source selection.
2 = Aux Bus 2 source selection. 6 = Aux Bus 6 source selection.
3 = Aux Bus 3 source selection. 7 = Aux Bus 7 source selection.
4 = Aux Bus 4 source selection. 8 = Aux Bus 8 source selection.
9 through to 0 = the Aux Bus is selected from the panel.

Connecting the panels to the switcher

One or more panels may be connected to one switcher port to give independent control of each Aux. This is achieved by using the RS485 loop connector on the Pro-Bel rear panel to connect to the next panel. The Aux to be controlled by a particular panel is set by the address rotary switch as described above.

Switcher set-up for Pro-Bel panels

The switcher serial port to which the panel is connected must be set to “Aux Ctrl ProBel”.

OTHER INSTALLATION PROCEDURES – *continued*

Quartz panels

The Quartz Electronics CP3201 - S7 Remote Panel may be used to switch signal sources to the switcher auxiliary outputs from a location remote from the switcher control panel.

Note. The Quartz Remote Panel used MUST be the -S7 version which uses an Open Protocol and is the only Quartz protocol understood by the switcher.

The picture below shows the Quartz panel button allocation. The rightmost buttons are used to select the Aux output when one Quartz panel is being used to control more than one Aux output. The left buttons select which source is allocated to the Aux.

Panel set-up

The Quartz panel has an address which is used to determine which Aux output is controlled by the panel. The address is set by card-edge switches located to the right rear of the main board. Depending on manufacture date there will be a 4 way DIP switch and either one or two rotary HEX switches. Where there are two rotary switches they set the address, the left one sets the high byte and the right one the low byte. Where there is only one rotary switch the high byte (bits 4 & 5) is set by switches 3 & 4 of the DIP switch.
The high byte should be set for the address range 10H to 1FH, this is position 1 for the rotary control or DIP 3 & 4 up. The (other) rotary switch then sets the address within this range, where addresses 0 to 7 select Aux outputs 1 to 8 respectively and address 8 allows the panel to control all available Aux outputs.

The remaining two DIP switches should be set to - DIP 1 = UP, DIP 2 = down.

The computer interface board CI-0003 (fitted as standard to the CP3200 -S7 panel) has a link to select the communications protocol to RS232 or RS422. This link should be set to RS422. The RS422 position is identified by a “4” (the RS232 position by a “2”).

Switcher set-up for Quartz panels

The switcher serial port to which the Quartz panel is connected must be set to “Aux Ctrl Quartz”.

Connecting the panels to the switcher

There are three methods of switching the Aux sources –

1. A panel connected to one switcher mainframe serial port to control all available Aux outputs.

2. A panel connected to a switcher mainframe port for each Aux output to be controlled.

3. Up to eight panels connected to one switcher mainframe port to control all available Aux outputs on a one panel per Aux output. This method requires some simple interface equipment being made, see below.

OTHER INSTALLATION PROCEDURES – *continued*

1. All Aux O/Ps controlled from one panel.

   The Quartz and Pro-Bel remote panels have buttons which select the required Aux output.

   The panels are connected to any of the four RS-422 serial ports on the switcher mainframe using a standard RS-422/RS-485 cable. The selected port has to have its protocol set to "Aux Ctrl Probel" or "Aux Ctrl Quartz" as appropriate.

   To select a source for an Aux O/P, press the button relating to the Aux, then press the button relating to the source.

Note. The Aux selection is a latching function and so remains selected until a different Aux is selected.

2. A remote panel for each Aux O/P.

   In this scenario a panel is required for each Aux O/P to be remotely controlled. Each panel is connected to a switcher serial port using a standard RS-422/RS485 cable and the protocol for that port is set to "Aux Ctrl Probel" or "Aux Ctrl Quartz" as appropriate.

3. More than one panel connected to one switcher port.

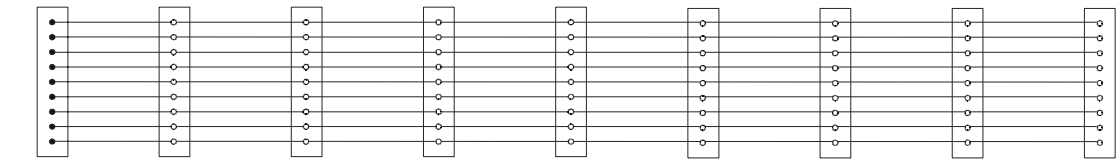
   Up to eight panels can be connected to one switcher serial port to give independent control of all available Aux O/Ps whilst only using one switcher port. The selected port has to have its protocol set to "Aux Ctrl Probel" or "Aux Ctrl Quartz" as appropriate.

   This method requires a RS-422/RS485 multi-way extender cable, a Master Diode Buffer unit and seven (max) Slave Diode Buffer units to be made, see below.

Note. In SD systems without a router there are only 4 Aux outputs available, Aux 1 to Aux 4 on the mainframe rear panel. Where a router is used Auxes 5 to 8 are available as untimed outputs from the router.

Extender cable

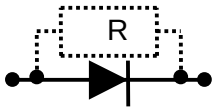
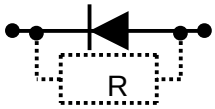
The extender cable is made from 9 way ribbon cable, 1 x 9 way "D"- type male connector and (up to) 8 x 9 way "D"- type female connectors. The male connector goes at one end of the ribbon cable.



The male 9 way "D"- type connects to the switcher port and the control panels connect to the female connectors via the Diode Buffers which are detailed below .

OTHER INSTALLATION PROCEDURES – *continued*

Diode Buffer

Description	9 pin "D"- type Male Connector (To Remote Panel)	Wiring of pins between Connectors	9 pin "D"- type Female Connector (To Extender)
GND	Pin 1		Pin 1
TX -	Pin 2		Pin 2
RX +	Pin 3		Pin 3
-	Pin 4		Pin 4
-	Pin 5		Pin 5
-	Pin 6		Pin 6
TX +	Pin 7		Pin 7
RX -	Pin 8		Pin 8
GND	Pin 9		Pin 9

Both diodes are 1N4148 and both resistors are 100 ohm.

The resistors are only fitted to the master diode buffer.

OTHER INSTALLATION PROCEDURES – *continued*

Interconnection & Set-up

The Diode Buffers connect directly to the Computer Port of the Quartz panel or the Loop port of the Pro-Bel panel. A standard RS-422/RS485 cable connects the Diode Buffers to the extender cable. If less than four Quartz panels are used the Master Diode Buffer must still be used and in the connector at the end of the extender. The extender connects to any one of the switcher mainframe serial ports.

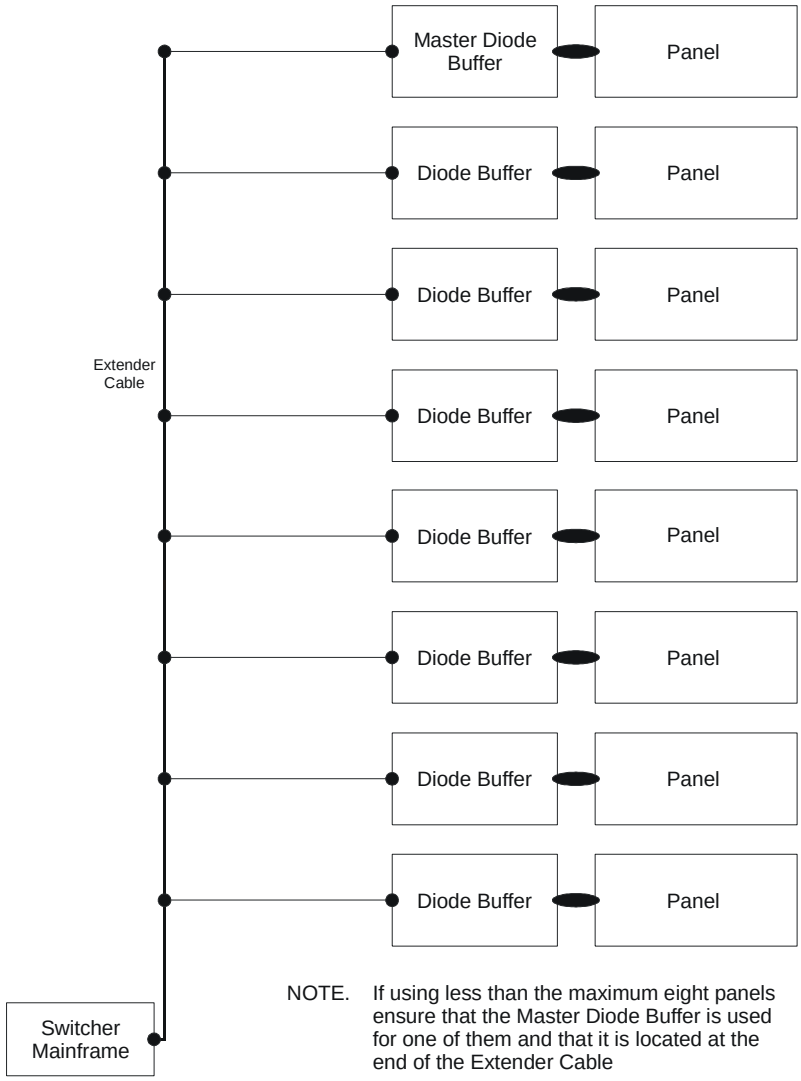
The Switcher

The protocol of the switcher port must be set to “Aux Ctrl Probel” or “Aux Ctrl Quartz”, as appropriate, in the Config - System - Port Protocols menu.

The Panels

The panels should be set-up as detailed in previous pages.

Interconnect Diagram



CONNECTOR PINOUTS

Table 1: Mainframe RS-422 Connector Pinout

9-way female D-type	FUNCTION
1	Frame Ground
2	Transmit A (Tx-)
3	Receive B (Rx+)
4	Receive Common
5	[No connection]
6	Transmit Common
7	Transmit B (Tx+)
8	Receive A (Rx-)
9	Frame Ground

The four RS-422 ports are software-configurable to be that for either a controlling device or, more commonly, a controlled device.

Above is shown the industry standard wiring for a controlled device, which is the configuration used for all the editor interfaces currently supported. In most cases only a pin-to-pin cable is required to connect these sockets to an external editor.

If the port should ever be configured as a controlling device, simply exchange the words “Transmit” and “Receive” to arrive at the correct wiring.

Table 2: Mainframe RS-232 Connector Pinout

9-way female D-type	FUNCTION
1	
2	Rx (Data Out)
3	Tx (Data In)
4	
5	Ground
6	
7	
8	
9	

As can be seen from the above, the SD1000 Mainframe is configured as a DCE (not DTE) RS-232 device, therefore only a pin-to-pin cable is required to connect this port to a PC. This configuration is fixed.

Switcher GPIs / GPOs

25 Way D-type connectors - switcher mainframe rear panel

Tally 1-12

Pin	Signal
1	GPO 1a
2	GPO 2a
3	GPO 3a
4	GPO 4a
5	GPO 5a
6	GPO 6a
7	GPO 7a
8	GPO 8a
9	GPO 9a
10	GPO 10a
11	GPO 11a
12	GPO 12a
13	n/c
14	GPO 1b
15	GPO 2b
16	GPO 3b
17	GPO 4b
18	GPO 5b
19	GPO 6b
20	GPO 7b
21	GPO 8b
22	GPO 9b
23	GPO 10b
24	GPO 11b
25	GPO 12b

Tally 13-24

Pin	Signal
1	GPO 13a
2	GPO 14a
3	GPO 15a
4	GPO 16a
5	GPO 17a
6	GPO 18a
7	GPO 19a
8	GPO 20a
9	GPO 21a
10	GPO 22a
11	GPO 23a
12	GPO 24a
13	n/c
14	GPO 13b
15	GPO 14b
16	GPO 15b
17	GPO 16b
18	GPO 17b
19	GPO 18b
20	GPO 19b
21	GPO 20b
22	GPO 21b
23	GPO 22b
24	GPO 23b
25	GPO 24b

Tally 25-32 & GPI 1-8

Pin	Signal
1	GPO 25a
2	GPO 26a
3	GPO 27a
4	GPO 28a
5	GPO 29a
6	GPO 30a
7	GPO 31a
8	GPO 32a
9	GPI 1
10	GPI 3
11	GPI 5
12	GPI 7
13	GPI Common
14	GPO 25b
15	GPO 26b
16	GPO 27b
17	GPO 28b
18	GPO 29b
19	GPO 30b
20	GPO 31b
21	GPO 32b
22	GPI 2
23	GPI 4
24	GPI 6
25	GPI 8

Each pair of GPO pins (for example GPO 1a & GPO 1b) are connected to contacts of a solid-state relay rated at 60V DC or AC Peak, 1A continuous. There is no particular polarity requirement.

Quad DSK GPIs

There are eight GPI inputs which form GPIs 9 to 16 in the switcher GPI menu.

The pinouts on the 25way D-type GPI & TALLY connector are given below.

Pin	GPI	Pin	GPI
9	9	22	13
10	10	23	14
11	11	24	16
12	12	25	16
13	Common		

CABLE WIRINGS

Control Panel to LCD Touch Screen 15-way Cable

Control Panel 15-way sub-D-type Male		Cable Colour		LCD Touch Screen 15-way sub-D-type Male	
LCD_LCDS0– LCD_LVDS1–	Pin 1 Pin 2	Pair 1	Blue Black	Pin 6 Pin 7	LCD_LCDS0– LCD_LVDS1–
LCD_LVDS2– LCD_LVDSCLK–	Pin 3 Pin 4	Pair 2	Red Black	Pin 8 Pin 9	LCD_LVDS2– LCD_LVDSCLK–
LCD_LVDS0+ LCD_LVDS1+	Pin 6 Pin 7	Pair 3	White Black	Pin 11 Pin 12	LCD_LVDS0+ LCD_LVDS1+
LCD_LVDS2+ LCD_LVDSCLK+	Pin 8 Pin 9	Pair 4	Brown Black	Pin 13 Pin 14	LCD_LVDS2+ LCD_LVDSCLK+
GND GND	Pin 11 Pin 12	Pair 5	Yellow Black	Pin 1 Pin 2	GND GND
GND GND	Pin 13 Pin 14	Pair 6	Green Black	Pin 3 Pin 4	GND GND

The cable used has six twisted-pairs of 7/0.2mm wire and an overall shield.

CABLE WIRINGS - *continued*

Control Panel to LCD Touch Screen 44-way Cable

Control Panel 44-way sub-D-type Male		**Cable Colour**	**LCD Touch Screen 44-way sub-D-type Male**	
GND	Pin 1	White-Blue	Pin 1	GND
CPUD9	Pin 2	Blue-Black	Pin 2	CPU9
CPUD6	Pin 3	Orange-Blue	Pin 3	CPU6
CPUD3	Pin 4	Green-Blue	Pin 4	CPU3
CPUD0	Pin 5	Grey-Blue	Pin 5	CPU0
V3V3_PSU	Pin 6	Red-Black	Pin 6	V3V3_PSU
GND	Pin 7	Yellow-Green	Pin 7	GND
+12V_PSU	Pin 8	White-Green	Pin 8	P12V_PSU
GND	Pin 9	Green-Black	Pin 9	GND_LCD
GND	Pin 10	Orange-Green	Pin 10	GND_LCD
+12V_PSU	Pin 11	Orange	Pin 11	P12V_LCD
+12V_PSU	Pin 12	Grey-Green	Pin 12	P12V_LCD
~HW_RESETD	Pin 16	White-Red	Pin 16	~HW_RESET
CPUD8	Pin 17	Red-Brown	Pin 17	CPU8
CPUD5	Pin 18	Green	Pin 18	CPU5
CPUD2	Pin 19	Blue	Pin 19	CPU2
FROM_TOUCH	Pin 20	Yellow	Pin 20	TOUCH_TX
V3V3_PSU	Pin 21	Brown	Pin 21	V3V3_PSU
GND	Pin 22	Black	Pin 22	GND
+12V_PSU	Pin 23	White	Pin 23	P12V_PSU
GND	Pin 24	Violet	Pin 24	GND_LCD
GND	Pin 25	Turquoise	Pin 25	GND_LCD
+12V_PSU	Pin 26	Pink	Pin 26	P12V_LCD
+12V_PSU	Pin 27	Yellow-Brown	Pin 27	P12V_LCD
CPUD10	Pin 31	Yellow-Red	Pin 31	CPU10
CPUD7	Pin 32	Yellow-Blue	Pin 32	CPU7
CPUD4	Pin 33	Green-Red	Pin 33	CPU4
CPUD1	Pin 34	White-Violet	Pin 34	CPU1
TO_TOUCH	Pin 35	Red-Blue	Pin 35	TOUCH_RX
V3V3_PSU	Pin 36	Red	Pin 36	V3V3_PSU
GND	Pin 37	Violet-Black	Pin 37	GND
+12V_PSU	Pin 38	Yellow-Violet	Pin 38	P12V_PSU
GND	Pin 39	Grey	Pin 39	GND_LCD
GND	Pin 40	Grey-Brown	Pin 40	GND_LCD
+12V_PSU	Pin 41	Brown-Black	Pin 41	P12V_LCD
+12V_PSU	Pin 43	White-Brown	Pin 43	P12V_LCD

The cable used has thirty-six cores of 7/0.2mm wire and an overall shield.

SYSTEM WITH INTEGRATED ROUTER

An integrated router may by used with the SD1512 system to increase the number of available sources. This router may be the Snell & Wilcox SD1132 or a supported third party router. When using an integrated router the switcher mainframe inputs become bus inputs rather than source inputs. Outputs 1 to 20 of the router are connected to inputs 1 to 20 of the switcher mainframe. Router outputs 21 to 24 are the (untimed) Aux outputs 5 to 8.

NOTE.

The second input card is required in the SD1000 mainframe if a router is used.

If it is required to be able to select Program, Clean Program, Preview 1 or Preview 2 on the Aux outputs these signals must be connected, in the above order, to the four highest number inputs of the router, i.e., Preview 2 to the highest number input.

NOTE.

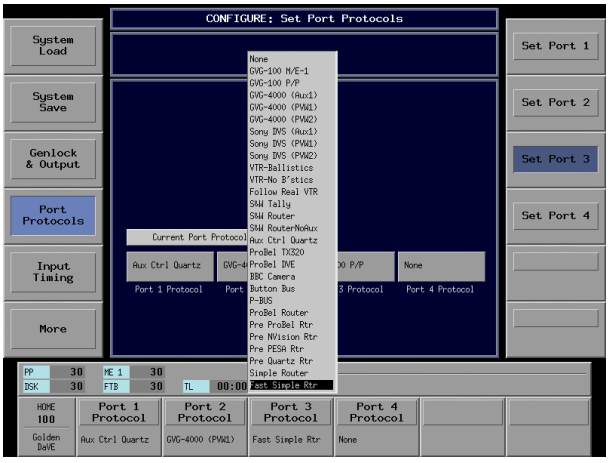
If the router being used has more than 24 outputs an offset may be set to move the outputs being used with the switcher to a contiguous block of 24 starting at a output other than 1. This offset facility does not apply with the Snell & Wilcox SD1132 Router.

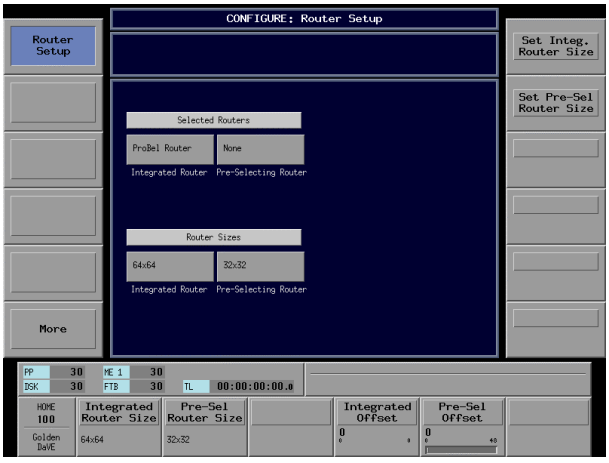
Setting the System for a Router

The router is controlled from the switcher via a RS422 link. The router control protocol has to be allocated to a switcher comm port in the Configure - Port Protocols menu, any of the four comm ports may be used although comm port 1 is normal. For the SD1132 router set “S&W Router” to comm port 1 (**do not set “S&W Router No Aux”**). For supported third party routers see the table below.

Router Model	Protocol
Pro-Bel SD Freeway	Fast Simple Rtr
Pro-Bel SD Eclipse	ProBel Router
Quartz SD series	Simple Router

Having set the router protocol the size of the router has to be set in the Configure - Router Setup menu.





In order to be able to select the extra sources the switcher control panel keymap may be changed to allow direct selection of, up to, 36 sources on a bus although this would mean losing the framestores and matte, wash and black. To edit the Keymap see the Snell & Wilcox document “Control Panel Keymap Editing & Increasing Video Sources” which is available from the Customer Support department.

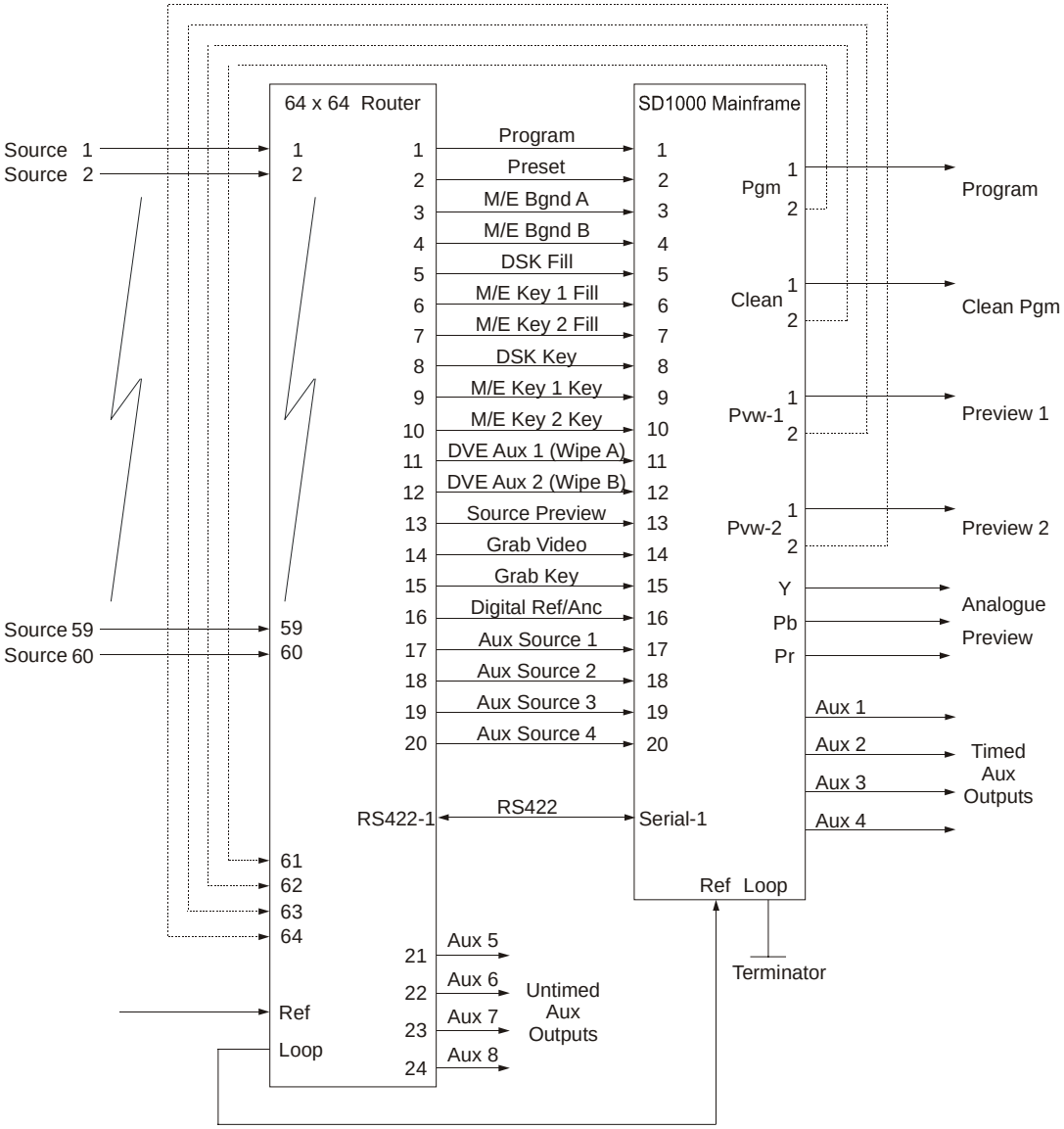
SYSTEM WITH INTEGRATED ROUTER - *continued*

Referencing - Input Timing

Timing is similar to a non router system, however the analogue sync signal fed to the Router must be co-timed to all sources within a few lines to obtain clean switching along the busses. Obviously, if the video sources are not co-timed within a few lines, this condition cannot be achieved. In this case, clean transitions on the final program are still possible by performing all source changes as transitions. Provided all sources are within the input timing windows, transition flip-flops on the M/E Background and Program/Preset busses are still clean, since they are performed in the Switcher Mainframes, not in the Router.

Note. In the Configure - Timing menu set Time From to V, see User Reference Manual.

Router / Mainframe connections diagram



Note. The Program & Preset Busses and the M/E A & B Busses swap on transitions.

The above diagram shows a 64 input router. Connections between any router and the switcher are the same as in the above diagram except for the returned signals. These signals, Program, Clean, Preview 1 and Preview 2 are fed back into the router so as be available for the Aux outputs. If this is not required the returns need not be connected. However where they are connected the must go to the highest number inputs of the router and in the same order as shown above.

SECTION B

SPECIFICATIONS

TELEVISION STANDARDS

Television Standards	Dual Standard 525 line / 625 line, on-line switchable
Picture Format	4:3 or 16:9, on-line switchable

INTERNAL PROCESSING

Data Rate	4.2.2.4 Luma & Key 13.5 MHz Pb & Pr 6.75 MHz
Resolution	10 bits with Dynamic Rounding™ where appropriate. (Dynamic Rounding™ is licensed from Quantel Ltd.)
Synchronisation	Input frame synchronisers on all paths.

INPUTS

Number of Video/Key Inputs	12 (optional 24) Serial Digital each on 1 x BNC Assignable to video or key
Reference Input	On-line Switchable between: From any (SDI) Video Input. Analogue sync or black burst on 2 x BNC loop-through.

INPUT FORMATS & LEVELS

Video/Key Input Format	270 Mbits/second serial digital interface as per CCIR REC-656/SMPTE 125, 259 (D1)
Analogue Reference	300mV sync with optional 300mV pk-pk burst ±6dB High Impedance (loop-through)
Input Impedance:	75 ohms (except reference input).

OUTPUTS

Program Outputs	2-off SDI each on 1 x BNC, on-line switchable between 8 & 10 bits.
Clean Program Outputs	2-off SDI each on 1 x BNC, on-line switchable between 8 & 10 bits.
Preview 1 Outputs	2-off SDI each on 1 x BNC, on-line switchable between 8 & 10 bits. 1-off on-line switchable YPbPr / RGB on 3 x BNC 2-off SDI each on 1 x BNC, on-line switchable between 8 & 10 bits.
Preview 2 Outputs	2-off SDI each on 1 x BNC, on-line switchable between 8 & 10 bits.
Aux 1 to Aux 4 Outputs	2-off SDI each on 1 x BNC
Reference Output	1-off Analogue sync on 1 x BNC

OUTPUT FORMATS & LEVELS

Video Output Format	270 Mbits/second serial digital interface as per CCIR REC-656/SMPTE 125, 259 (D1)
Analogue Preview Y/R/G/B	700mV black-white with 300mV sync.
Analogue Preview Pb / Pr	700mV pk-pk for 100% bars.
Analogue Reference	300mV sync.
Output Impedance:	75 ohms

CONTROL INTERFACES - SD1000 Mainframe	
Control Panel	10 base T-X on 1 x RJ45 connector.
Network #1	10 base T on 1 x RJ45 connector. 10 base 2 on 1 x BNC.
Network #2 (optional)	10/100 base T on 1 x RJ45 connector.
Interfaces to external equipment, e.g. editor, DVE, audio mixer, etc.	4-off freely-assignable freely-configurable RS-422 each on 1 x 9-way female D-type. Protocols currently implemented include GVG-100/110, GVG-3000/4000, Aux panel (proprietary) *(all manufacturer's trademarks respected)*.
GPI inputs	8 TTL-level inputs on ½ x 25-way female D-type.
Tally outputs	32 isolated contact closures on 2½ x 25-way female D-type.
RollCall™	Arcnet on 1 x BNC.
Diagnostics	RS-232 (DCE) on 1 x 9-way female D-type.

CONTROL INTERFACES - Control Panel Main Chassis

Mainframe	10 base T on 1 x RJ45 connector.
Built-in Display	1 x 25-way female D-type. 1 x 9-way female D-type.
External Keyboard	PC compatible on 1 x 6-pin mini-DIN (PS/2-style) socket.
External Pointing Device	RS-232 (DTE) on 1 x 9-way male D-type. (Driver software not currently implemented.)
External Display	SVGA-compatible on 1 x 15-way female sub-D-type.
Diagnostics (Early Panels)	RS-232 (DTE) on 1 x 9-way male D-type.
Diagnostics (Later Panels)	RS-232 (DCE) on 1 x 9-way female D-type.

CONTROL INTERFACES - Control Panel Built-In Display

Control Panel	1 x 25-way female D-type. 1 x 9-way female D-type.

PHYSICAL - SD1000 Switcher Mainframe

Size	
Height	5U (rack units) ~222 mm.
Width	19 inches nominal ~ 485 mm including brackets.
Depth	22 inches nominal ~ 560 mm including mating connectors

PHYSICAL - CP1512 Control Panel

Size	
Overall	871mm x 537mm (not including display overhang)
Tub	819mm x 511.5mm
Suggested Cutout	822mm x 517mm
Depth Clearance	200mm

Environmental	5 to 35 °C non-condensing.

POWER SUPPLY

SD1000 Switcher Mainframe (Dual PSU Option)	Single (option of two) fully-independent hot-swappable PSU modules, with separate mains power feeds via 2 x IEC socket.
Control Panel (except CP1008)	Two fully-independent PSU modules, with separate mains power feeds via 2 x IEC socket.

POWER REQUIREMENTS

Voltage (nominal)	115/230V 50/60Hz
SD1000 Mainframe Power	500 Watts max with all options fitted.
Control Panel Power	Less than 50 Watts.

END OF MANUAL