
6330 192 x 32 HD SERIES VIDEO SWITCHER**CONTENTS**

Paragraph	Title	Page
1	APPLICATION	1
2	SPECIFICATION	2
2.1	Inputs	2
2.2	Outputs	2
2.3	Performance	2
2.4	Options	3
2.5	Monitoring	4
2.6	Control	4
2.7	Mechanical	4
2.8	Operating Temperature	4
2.9	Connectors	4
3	ROUTER DESCRIPTION	5
3.1	Power Supplies	5
4	INSTALLATION	6
4.1	Mechanical	6
4.2	Earthing	6
4.3	Notes on Wiring Diagram	6

5	CONNECTOR DETAILS	7
5.1	Video Inputs (1657 and 1658)	7
5.2	Video Outputs (1598)	7
5.3	Reference Inputs (1522)	7
5.4	Monitor Outputs (1522)	7
5.5	RS422/RS485 Serial Control (1522)	7
5.6	RS232 Serial Control (1522)	7
6	MAINTENANCE AND WARRANTY	8
6.1	General	8
6.2	Warranty	8

1 APPLICATION

The 6330 consists of a 12U rack frame with capacity for a 192 input, 32 output video switcher having internal main and back-up power supplies with serial control by RS422 or RS232.

Multiple 6330 frames with inputs fed from external video distribution amplifiers allow matrices of greater than 32 outputs.

2 SPECIFICATION

Including 6255 input buffer and 5m input cables

2.1 Inputs

Number and type: 192
 Impedance: 75 Ω
 Return loss
 terminated in 75 Ω: >46dB to 4.43MHz
 Balance (common
 mode rejection): >36dB at 50Hz
 >30dB at 100kHz
 Maximum
 common mode
 signal: >10V p-p
 Allowable
 superimposed d.c.
 on input: ±30V

2.2 Outputs

Number and type: 32 (2 per destination) unbalanced
 Impedance: 75 Ω
 Level: 1V p-p nominal
 2V p-p pulses
 Return loss: >42dB to 4.43MHz
 >36dB to 8MHz
 Superimposed d.c: <30mV relative to signal average
 Isolation: >40dB 50Hz to 5.5MHz
 Destination
 monitor type: 1 unbalanced
 Destination
 monitor
 impedance: 75 Ω

2.3 Performance

Gain: 0dB nominal ±0.05dB on any route
 Gain stability: <0.1dB
 Gain range: -1dB to +2dB of nominal
 Headroom (input
 or output): +3dB (video)
 +1dB (pulses)
 Frequency
 response: <±0.1dB to 5.5MHz
 +0.1 -0.25 to 8MHz
 +0.25 -0.5 to 12.5MHz
 +0.25 -2dB to 30MHz
 Group delay: <5ns @ 12.5MHz
 Delay variation: Better than ±0.6ns all inputs to any one
 destination
 Better than ±2.0ns between any two paths

Chrominance/ luminance relative delay:	<5ns
Chrominance/ luminance gain inequality:	<1%
2T pulse/bar response:	<0.2%K
Bar response:	<0.2%K
2T pulse response:	<0.2%K
50Hz squarewave tilt:	<0.2%K
V.L.F. step response:	<10% first overshoot
Line time non-linearity:	<0.2%
Intermodulation distortion:	<0.5%
Differential phase:	<0.15° @ 4.43MHz
Differential gain:	<0.15% @ 4.43MHz
Noise (to CCIR 567-2):	< - 80dB RMS luminance weighted < - 80dB RMS chrominance weighted < - 60dB p-p LF and random
Switching transients:	<30mV (positive only)
Black level steps:	<40mV between inputs with same input coupling mode
Crosstalk:	< - 66dB @ 4.43MHz adjacent hostile < - 60dB @ 4.43MHz all hostile
Transition timing:	Instantaneous, picture or field phased nominally on line 9 (322) of reference video input. Multiple changes occur simultaneously

2.4 Options

Output processing (sub-units)*:	
Cable equalisation to 12MHz;	3862 up to 100m of F&G 0.6/3.7 - 75 Ω or equivalent 3864 up to 150m of F&G 1.0/6.6 - 75 Ω or equivalent

*Options are mutually exclusive

2.5	Monitoring	<p>Sub-unit: 3322 Monitoring relay switcher 8 x 1</p> <p>Monitor combiner: 3321 Logic controlled monitoring output amplifier</p>
2.6	Control	<p>Basic control (2414): 2 ports 2 wire serial RS422/RS485 or RS232 with CTS, RTS, DTR or DSR</p> <p>Standard protocol - Pro-Bel General (see 2414 handbook)</p> <p>Switcher power required: 220VA</p>
2.7	Mechanical (6330 Only)	<p>Frame: 12U 19" rack frame</p> <p>Width: 483mm</p> <p>Depth: 400mm</p> <p>Height: 533mm</p> <p>Weight: 30Kg</p>
2.8	Operating Temperature	<p>Range: 0° C to 45° C</p> <p>Cooling: Convection</p>
2.9	Connectors	<p>Video input/output: BNC</p> <p>Video output monitor: BNC</p> <p>Control: 'D' type with screw lock</p> <p>Power: IEC 6A</p>

3 ROUTER DESCRIPTION

The switcher has a minimum capacity of 16 inputs and 8 outputs expandable in increments of 8 sources and destinations.

Inputs from external video distribution amplifiers are terminated in $75\ \Omega$ resistors on the spine/splitter cards and fed directly to the crosspoint cards in each frame.

Switching cards type 3162 house the video crosspoints and local latching for control. The crosspoints are arranged in the form of a 16×16 matrix made up of 64 individual 4×1 integrated circuits. The crosspoint control source and destination address lines are bussed across the 3162 cards by motherboard and between frames by ribbon cable to the local control card.

Card type 3361 contains the output amplifiers for the crosspoint rows. Each card houses 8 independent amplifiers capable of driving two $75\ \Omega$ loads and an auxiliary output for monitoring. Optional plug-in sub-boards can be fitted to 3361 cards to provide output monitoring and cable equalisation.

The crosspoint modules contain local on-board latches to interface to a control system using parallel data distribution. This technique limits non-bussed control wiring to individual card handshakes which provide card presence and power rail status. The remaining control signal bussing comprises serial source and destination addresses. The local control card is a 6800 microprocessor based card providing two serial ports, configurable as RS422 or RS232 for communication with external microprocessor based control systems/panels. A battery powered RAM prevents loss of crosspoint selection information in the event of a power failure.

Vertical internal switching can be achieved by connecting a feed of mixed syncs or composite video to the reference inputs of the switcher (1522 assembly). In the absence of a reference signal, inputs should be terminated in $75\ \Omega$ and switching time will be random, within 2ms of receipt of command.

3.1 Power Supplies

(Refer to power supply module handbook for details).

The switcher requires a PSU providing $\pm 11V$, $\pm 8V$ and $+5V$ plugged into one of the motherboards. Power wiring within the frame is commoned, allowing the second motherboard to house a back-up supply.

4 INSTALLATION



WARNING: For safety reasons the system must not be operated until the earths have been connected correctly.



WARNING: No attempt should be made to service cards using surface mount technology without the equipment and appropriate trained engineers.

4.1 Mechanical

The switcher is housed in a 19", 12U high rack mounted frame. All modules plug into the frame to allow easy access for servicing and are normally protected behind a hinged front panel. The 6U high cards each have three DIN41612C plugs that connect into the motherboard which carries power, signal and control wiring between cards. Spine/splitter cards provide input BNC and source bussing to each frame. Output connections are made by coax cables soldered to daughter boards which plug on to the motherboards DIN41612C rear connector spalls.

Extender board type 1336 can be used with the 6U cards for servicing.

4.2 Earthing

Three system earths wired in the frame are accessible via the power input connectors. The three earths are:



Mains Earth-wired to the earth pin of the mains input connector.



Signal Earth-wired to the system 0V supply and then to the signal cable screens.



Chassis Earth-wired to the metalwork of the frame and cable connector metalwork.

These three earths are left entirely separate within the switching system and can be joined on the terminal block or wired to separate earthing points as dictated by the nature of the installation.

4.3 Notes On Wiring Diagram

Module locations are referred to by two numbers. For example 1.6 refers to the module location situated in the sixth position along (counting from left to right when viewed from the front) in frame 1 (the top). Where common motherboards are used in a switcher, the frame number on the circuit diagram is replaced with an 'X'.

Module connection pin numbers are suffixed by either the letter A, B or C. When viewed from the rear, pins suffixed C are on the left hand side of the connector, B are in the middle, while A pins are on the right hand side.

5 CONNECTOR DETAILS

5.1 Video Inputs (1657 And 1658) BNC

5.2 Video Outputs (1598) BNC

5.3 Reference Inputs (1522) BNC

5.4 Monitor Outputs (1522) BNC

5.5 RS422/RS485 Serial Control (1522) 9 way Cannon 'D' type socket with screw lock, wired as 'Tributary'.

PIN NO	FUNCTION
1	Chassis 0V
2	Output-
3	Input+
4	System 0V
5	N/C
6	System 0V
7	Output+
8	Input-
9	Chassis 0V

5.6 RS232 Serial Control (1522) 25 way Cannon 'D' type socket with screw lock.

PIN NO	FUNCTION	PIN NO	FUNCTION
1	Chassis 0V	14	N/C
2	Rx (Data In)	15	N/C
3	Tx (Data Out)	16	N/C
4	DTR (Data Terminal Ready)	17	N/C
5	RTS (Request To Send)	18	N/C
6	DSR (Data Set Ready)	19	N/C
7	0V (Signal Gnd)	20	N/C
8	N/C	21	N/C
9	N/C	22	N/C
10	N/C	23	N/C
11	N/C	24	N/C
12	N/C	25	N/C
13	N/C		

6 MAINTENANCE AND WARRANTY

6.1 General

No regular maintenance is required on this product or any of its sub-units. In the case of faults, first check the regulated power supplies using the PSU monitor points.

6.2 Warranty



WARRANTY PERIOD

Hardware Products

Hardware Products are warranted for a period of two years from the date of shipment. During this period Pro-Bel, at its discretion, will repair or exchange products proved to be defective providing that the products are returned to Pro-Bel, carriage pre-paid. The Company will use its best efforts to ensure that returned items are repaired and despatched within ten working days of receipt. Third party items, including PC hardware or any outsourced equipment is limited to the original manufacturers warranty, typically one year.

Software Products

Software Products are warranted for a period of ninety days from the date of shipment. During this period Pro-Bel undertakes to rectify products proved not to conform to the published specification provided with the product, when used in accordance with PC hardware and operating systems approved by Pro-Bel.

Loans

Within the warranty period, the Company will, at its discretion and subject to availability, provide loan units pending the repair of returned items. Loans are offered on a no charge basis providing that the loan units are returned to Pro-Bel within a period of twenty one days following the date of despatch of the repaired items. In the event that the loan units are not returned within this period, the loan units will be subject to a monthly overdue charge, details of which are available on request. Carriage charges apply to all loans.

NON WARRANTY PERIOD

Outside the stated warranty period, the Company will use it's best endeavours to rectify equipment failures through the provision of spare parts or in house repair services.

Loan units may also be provided subject to availability. All services and carriage costs are subject to a scale of charges, details of which are available on request.

6.2.1 UK Customers

UK customers should return modules for repair marked as follows:

Test Manager
Pro-Bel Limited
Danehill
Lower Earley
Reading
Berkshire
RG6 4PB
England

Telephone: 01734 866123

6.2.2 US Customers

US customers should return modules marked as follows:

Service Department
Pro-Bel Inc.
4480 North Shallowford Road
Suite 102
Dunwood
Georgia 30338-6410

Telephone: 404 396 1971

6.2.3 Other Customers

Other customers should send the unit to their local agent, with the same information attached.