VISTEK V1668, V1668/SY & V1668/SY-VSL
12-BIT SDI TO PAL/NTSC ENCODER
USER GUIDE

www.pro-bel.com

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1. DESCRIPTION

The V1668 is a broadcast quality multi-standard encoder, which forms part of the Vistek V1600 range of interface products. It is a 3U high card which is fitted into either a V1601, V1603 or V1606 rack, from which it receives its power. A passive rear module, 130-0940, is required for all signal interconnections.

In its basic form, without any options fitted, the unit converts an SDI video signal to an analogue colour composite video in a variety of standards. It derives all its timing information from the D1 input signal.

An on-board frame synchroniser option is available (V1668/FS), which will allow the output to be timed up to a black and burst reference. The synchroniser has output timing adjustment range of +/-127 lines in steps of ~1ns. Three locking modes allow either tracking of reference SC/H phase, or a choice of two modes which always output a selectable SC/H phase irrespective of reference SC/H.

VisLock processing may be optionally factory fitted to the card (V1668/FS-VSL). VisLock processing is a patented method of converting an NTSC composite analogue signal to serial digital form (within the V1667), then subsequently re-converting back to NTSC (within a Vistek V1668 encoder) with negligible loss of picture quality.

The SDI input can be either 625/50 or 525/60 format, and the unit will automatically detect which and only allow operation in a standard compatible with that format. If the input signal fails then the unit will continue to operate in the current standard. The allowable standards for the two formats are:

625/50	PAL B/G/I, PAL N
525/60	NTSC, PAL M, NTSC JAPAN, NTSC 443

An external reference input may be connected. In the basic unit without synchroniser, the reference is not used. When the synchroniser option is fitted, then it is used as the primary output timing reference.

There are two SDI active feed-through outputs. These are fully re-clocked.

Four analogue outputs are provided; three are permanently colour composite video (CVBS) and the fourth is link selectable between CVBS and the reference loop-through output.

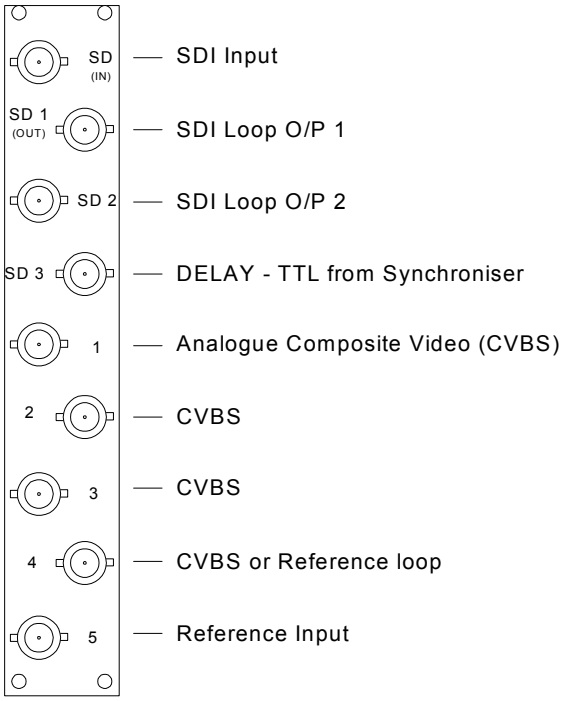
Front panel controls allow the user to set up various operating parameters, and if a synchroniser option is fitted they are used to time the unit into an installation.

The unit is also fully remote controllable via DARTnet, with either the Vistek V1605 Control Panel, PC based ViewFind software, or a third party control system interfacing to DARTnet.

2. INSTALLATION

2.1 Rear Panel Connections

The rear panel is shown below:



SIGNAL	SOURCE	COMMENTS
POWER	The Rack	12W
SDI I/P	SD (IN)	Equalisation up to 300m
SDI O/P 1	SD1 (OUT)	Cable drive up to 300m
SDI O/P 2	SD2 (OUT)	Cable drive up to 300m
Reference I/P	75Ω On board term.	LK2 jumper in position a-b
(Black & Burst)	High Impedance	LK2 jumper in position b-c
Analogue Outputs	CVBS on BNC 1-3	
	CVBS on BNC 4	LK1 jumper in position a-b
	Ref Loop on BNC 4	LK1 jumper in position b-c
DELAY	SD 3	TTL Delay from Frame Synchroniser

NOTE: For reliable colour field sequencing the Reference must have an SC/H of <±80°.

2.2 Insertion Delay

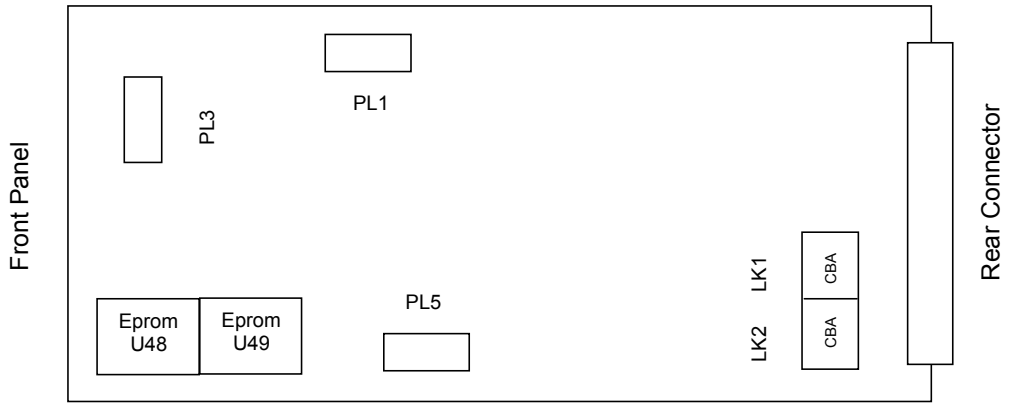
The insertion delay of the V1668 depends on whether the synchroniser option is fitted, the format and in 525 whether the Vislock feature is enabled. With no synchroniser it is deterministic and fixed.

Condition	Delay		
	625	525	VisLock
No Synchroniser or Minimum delay	3.6µs	3.6µs	3.6µs
Frame Synchroniser, Minimum	6.3µs	6.3µs	6.3µs
Frame Synchroniser, Maximum	40.05ms	33.42ms	66.78ms

2.3 Hardware

The figure below shows diagrammatically the main board along with certain components of interest. In particular it shows the position and orientation of the links discussed above.

The EPROM locations are shown, as they are the components that would need to be changed as a result of any in-field software upgrade.



Ref. On-board termination jumper.	75Ω On board term.	LK2 jumper in position a-b
	High Impedance	LK2 jumper in position b-c
Ref. Loop / CVBS4 selection jumper.	CVBS on BNC 4	LK1 jumper in position a-b
	Ref Loop on BNC 4	LK1 jumper in position b-c

2.4 Synchroniser Option

With the synchroniser fitted, adjustments can be made to the output timing relative to the reference using the front panel. This is described in Section 4.4.

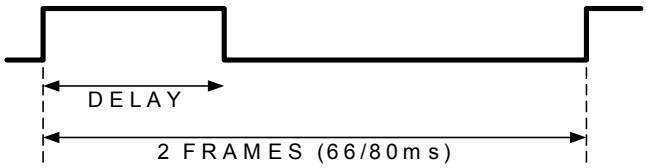
If a synchroniser module is fitted but no reference is supplied, then the output will be locked to the incoming SDI, with insertion delay as with no synchroniser option.

2.5 Frame Synchroniser Delay

When the Frame Synchroniser delay option is fitted there is a TTL signal to indicate the amount of extra delay inserted above the minimum as specified for the unit. The signal has a constant period of two frames and a variable mark space ratio which depends on the amount of delay inserted. The HIGH portion of the signal indicates the delay.

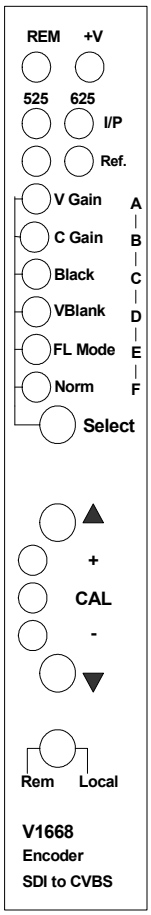
The minimum time the signal will remain in either state is limited to nominally 15µs, in order that equipment using the pulse can reliably detect it.

A typical waveform is as shown below:



3. OPERATION

3.1 Front Panel Principles



Remote Control Access and Power indicators

Input Status and Page indicators

Parameter indicators: Named for Top Page
A - F for other Pages

SELECT Button

UP Button - Parameter selection

CAL and OFF LEDs (see below)

DOWN Button: Parameter selection and
Page select, used with SELECT

REMOTE/ LOCAL control selection

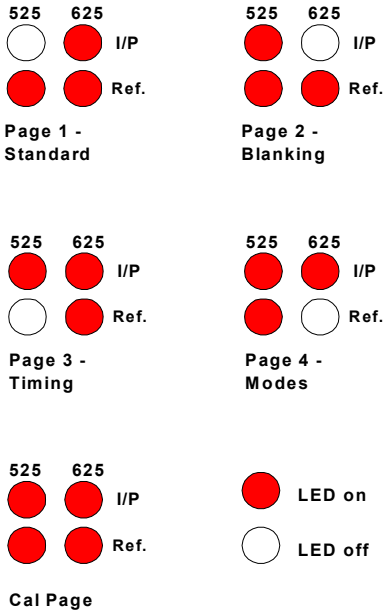
The V1668 has a versatile front panel shown above. It uses the concept of Pages and Parameters. There are 5 user Pages and within each Page there are a maximum of 5 parameters, each of which is adjustable; and a normalise function to set the whole page to its default settings. Some have distinct settings, such as MONO or COLOUR, while others are true variables, such as VIDEO GAIN.

NOTE: If the REM/LOCAL switch is in the REM position then the control panel buttons will be disabled.

There are 5 user Pages in total starting with the Top Page. This is the page that the unit starts on after first being powered, and will always return to if no button is pressed for a few minutes. It is indicated by less than three i/p / ref status LEDs being illuminated.

To change pages, the SELECT button is used as a shift key along with the ▼ button; i.e. you should press and hold the SELECT button and press the ▼ button momentarily. As well as the top page there are four more user control pages. The current page is indicated on the input status LEDs as shown in the figure below. There is also a sixth page which contains factory calibration controls. This page may be accessed by holding SELECT and ▲ for ~6s, and is indicated by all four input status LEDs on. **The calibration page contains factory calibration settings only, and should not be accessed by the user; it is documented for completeness only.**

Page Indications



Within each page there can be up to five parameters. To select any parameter within a page use the SELECT button as many times as necessary until the required LED is ON. After a parameter has been selected it can be adjusted using the ▲ and ▼ buttons, and a measure of its setting can be made by reading the three CAL LEDs. With most parameters the LEDs give an indication of whether and in what direction a variable has been adjusted. Section 4 describes this in more detail.

In the top page these are labelled on the front panel from Video GAIN to FaiL MODE. While in other pages the codes **A** to **E** are defined in Section 3.1, and in more detail in Sections 4 and 5**.** Parameter **F** is used for restoring the current page back to its defaults. To restore the current page to its default settings, select the **F** parameter, and hold down the ▲ and ▼ buttons for 5 seconds; all three CAL LEDs will briefly illuminate to indicate that the page has been reset. In the Top Page there is a seventh menu position for which none of the **A** to **F** LEDs is ON; this is a protected default condition where the ▲ and ▼ buttons have no effect.

In some configurations some parameters may have no effect. For example it is not possible to adjust the timing offsets if the synchroniser option is not fitted. In these cases it is not possible to select the relevant page or parameter (i.e. it will be skipped over, and the menu system will go to the next available control).

The ▲ and ▼ buttons have acceleration on some parameters which have a large range. This allows fine adjustments when required by using momentary button presses, while if the button is held down, large changes may be made rapidly.

The toggle switch at the bottom of the panel selects whether control of the unit is from the front panel, as described here, or through remote control. If REM is selected then all other buttons on the panel are disabled. The REM LED at the top of the panel will flash only if remote control has been selected AND the unit is being accessed by a remote control system.

NOTE: Having the REM/LOC switch in the REMOTE position is the most likely cause of a suspected control fault.

3.2 Parameter Map

The table below shows all menu options in brief. It may be useful to keep a copy close to the equipment.

	Top Page	Page 1 (STANDARD)	Page 2 (BLANKING)	Page 3 (TIMING)	Page 4 (Modes)	CAL
A	Video Gain	Standard	H Blanking	V Timing	Colour/U/V/ Mono	Video Level
B	Chroma Gain	Chroma Filter	V H-Blanking	H Timing	Freeze	Blank. Lev.
C	Black	NTSC setup	L23 Blanking	Fine H	FS Min Del.	VCO cntr.
D	V blanking	V blnk setup	Lim / Mult	SC/H	Hyteresis Length	
E	FL Mode		PAL B,G/I	Locking Mode	Vislock	
F	Norm	Norm	Norm	Norm	Norm	

3.3 Restoring Defaults

Hold the ▲ and ▼ buttons to reset current parameter to default. Holding ▲ and ▼ buttons for approximately 5 seconds while parameter **F** is selected will restore the whole page to its defaults. The whole unit may be reset to its factory default settings by holding the ▲ and ▼ buttons for 10s.

3.4 LED Indications

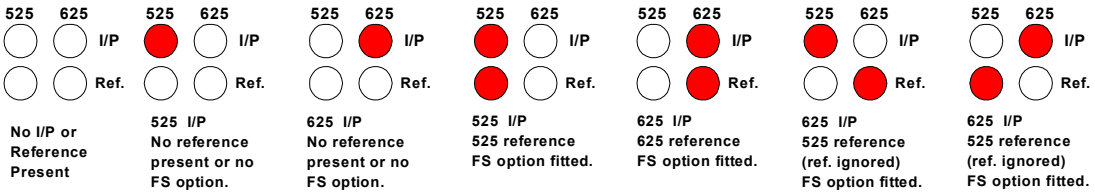
The front panel LEDs convey a lot of information to the user that may not be obviously intuitive. An explanation of front panel indications may be found in the table below.

(A) INDICATION	EXPLANATION
No I/P LEDs on (Top Page)	SDI input signal has failed.
No Ref LEDs on (Top Page)	Reference input signal has failed.
Parameter LED blipping	Indicates that that parameter in the current page is off-cal. or not in its default position.
Both UNCAL red LEDs blipping	Some currently unselected parameter is OFF CAL.
Three of 4 I/P / Ref LEDs on	Extinguished LED indicates current page.
All 4 I/P,Ref LEDs on	CAL Page selected.
Green CAL LED on	Current parameter is in its default or calibrated position.
One or both red LEDs ON	Current parameter is OFF CAL, or not in its default state. If the control is continuous (eg Video Gain) the red LEDs indicate the direction in which the control of off-cal, otherwise the cal LEDs indicate the option selected (detailed in Section 4).

4. PARAMETER DESCRIPTIONS

4.1 Top Page

Front panel indication - Normal I/P LED function ie. 2 or less I/P status LEDs illuminated.



(A) VIDEO GAIN

This provides an overall adjustment of video level, both luminance and chrominance, and is applied to the active video only. The adjustment range is subject the limited headroom of digital systems, at higher gain settings the U and V chrominance gains may limit independently, causing hue changes. The actual limits will be affected by the Chroma Gain setting.

Holding ▲ and ▼ buttons for 5s resets video gain to factory calibration.

(B) CHROMA GAIN

This provides an adjustment of chrominance level, and is applied to the active video only. The adjustment range is subject to the limited headroom of digital systems, at higher gain settings the U and V chrominance gains may limit independently, causing hue changes. The actual limits will be affected by the Video Gain setting.

Holding ▲ and ▼ buttons for 5s resets chroma gain to factory calibration.

(C) BLACK LEVEL

This provides an adjustment of the overall black level. The limit of approximately ±50mV applies with or without NTSC setup.

Holding ▲ and ▼ buttons for 5s resets black level to factory calibration.

(D) VERTICAL BLANKING

This varies the length of vertical blanking. The ▲ button narrows the blanking and ▼ button widens it within the limits defined in the table below.

FORMAT	Field 1	Field 2
625/50	7 – 22	320 - 335
525/60	10 – 20	9 - 19

This control defaults to blanking the whole of the vertical interval, and is indicated by the green CAL LED.

Holding ▲ and ▼ buttons for 5s resets the vertical blanking control to blank the whole of the vertical interval.

(E) SYNCHRONISER FAIL MODE

This selects one of three possible actions in the event of loss of input signal when the frame synchroniser is fitted. The options are to FREEZE, FREEZE for 3 seconds and then cut to BLACK, or cut directly to BLACK.

This control is only available if the synchroniser option is fitted.

Fail Mode	LED status	Direction
Freeze	R-	▲
Freeze 3s, cut to black	R+	
Cut to black	G	▼ ← default

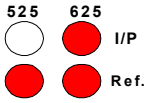
Holding ▲ and ▼ buttons for 5s resets the fail mode to default (cut directly to black).

(F) NORM

Holding down the ▲ and ▼ for ~5s will reset top page to its defaults.

4.2 Page 1 - Standard Selection

Front panel indication:



(A) STANDARD SELECT

Standards are only available for the current operating mode (625/50 or 525/60) so a correct input should be provided before changing the standard. It is only possible to select a standard that is compatible with the input format.

NTSC JAPAN is similar to NTSC M in all respects except that there is no set-up, and the gains are adjusted so that peak white level is the same.

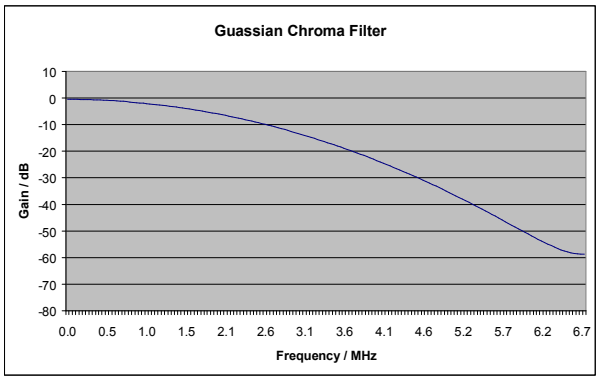
525 Standard	625 Standard	LED status	Direction
PAL M		R+, R-	▲
NTSC JAPAN		R-	
NTSC 443	PAL N	R+	
NTSC M	PAL I	G	▼ ← default

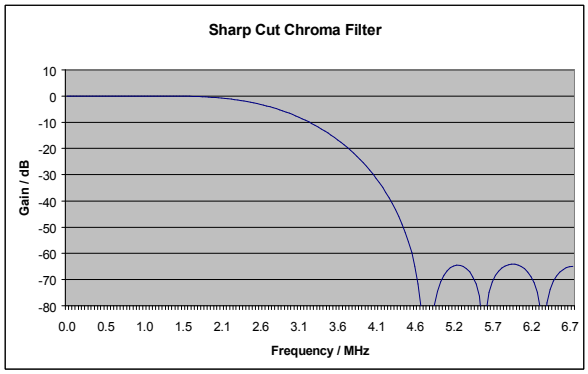
(B) CHROMA FILTER

This selects the Gaussian chroma filter within the coder which ensures the output signal meets the published specifications. In some cases the signal may be known to have band limited chrominance signals, in which case the filter may be disabled. In the case of the Gaussian filter being turned off, a sharp cut off filter, with flat pass band is applied to the chrominance. This function does not cycle, so the ▲ button is for OFF and the ▼ button is for ON.

The green CAL LED indicates that the filter is enabled, the R+ LED indicates that the filter is in sharp cut-off mode.

The default state for this control is ON.





(C) PEDESTAL (525 ONLY)

This control enables/disables pedestal (set-up) insertion in 525/60 standards except for NTSC JAPAN which has none. It has no effect in the 625/50 standards. Note – there is separate control to add pedestal to lines which are passed during the vertical interval.

The green CAL LED indicates that the pedestal is correctly applied. The R+ LED indicates that pedestal insertion is disabled.

The default state has pedestal insertion enable.

(D) VERTICAL INTERVAL PEDESTAL (525 ONLY)

This control adds pedestal to lines which are passed during the vertical blanking interval (selected by the vertical blanking control). This default state of this control is off (opposite to the active picture pedestal control). This control is only applicable to 525 standards other than NTSC JAPAN.

The green CAL LED indicates that there is no pedestal being applied during the vertical blanking interval. The R+ LED indicates that pedestal is being inserted into the vertical interval blanking.

The default state does not insert a pedestal into the vertical blanking interval.

(E) NOT USED

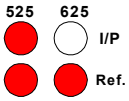
This menu option is not used, and cannot be selected.

(F) NORM

Holding down the ▲ and ▼ for ~5s will reset page 1 to its defaults.

4.3 Page 2 – Blanking

Front panel indication:



(A) HORIZONTAL BLANKING WIDTH

This selects either wide or narrow horizontal blanking. Wide blanking ensures that the output signal meets the published specifications, while narrow blanking allows the full CCIR Rec. 601 digital active line to pass. In the case of narrow blanking no shaping is applied to the edges of the video. When wide blanking is active, it may be applied in multiplicatively or by a limiting process, as described in the limit/multiplicative menu option (Section D). Note that there is a separate control for the blanking width during the vertical blanking interval (Section B).

This function does not cycle, so the ▲ button selects narrow blanking and the ▼ button selects wide blanking.

The green CAL LED indicates that WIDE blanking is applied. The R+ LED indicates that narrow H blanking is being applied.

The default for this control is wide horizontal blanking, i.e. the whole active digital line is passed.

(B) VBI HORIZONTAL BLANKING WIDTH

This control is similar to the horizontal blanking width control, but applies to any lines which are selected to be passed in the vertical blanking interval. Note that this control has the opposite default to the wide H blanking control – defaulting to narrow (to allow teletext etc. to be passed).

This function does not cycle, so the ▲ button selects narrow blanking and the ▼ button selects wide blanking.

The green CAL LED indicates that NARROW blanking is applied during the vertical blanking interval. The R- LED indicates that WIDE blanking is being applied during the VBI.

This default for this control is narrow blanking during VBI.

(C) L23 BLANK (625)

This enables and disables the blanking on the first half of line 23 in 625/50 format only. If operating in 525/60, then this parameter is bypassed, and therefore not available.

In Europe the first half of line 23 has been allocated for signalling information to wide-screen receivers.

The green CAL LED indicates that Line 23 blanking is applied. The R+ LED indicates that the entire of L23 is passed.

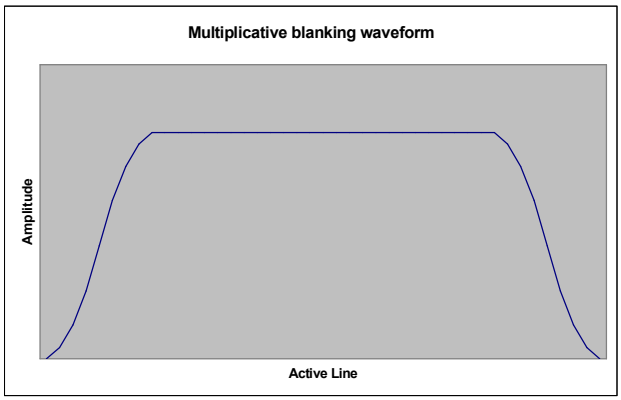
The default for this control is to blank the first half of line 23.

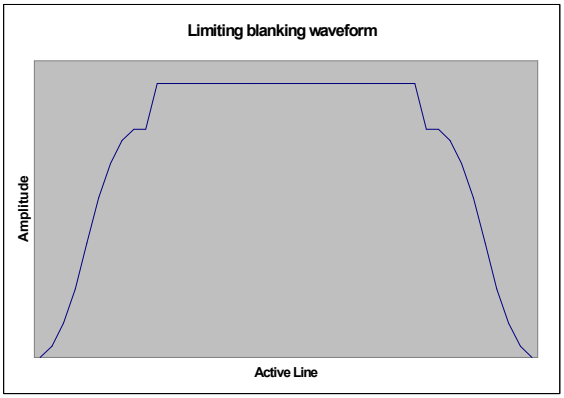
(D) LIMIT/MULT BLANKING

When wide horizontal blanking is applied, there are two methods by which it can be implemented. The first method is by a multiplicative process; in this case the active video is multiplied by a shaped waveform to bandwidth limit the video edges. In some cases where the video may have been pre-blanking, this method can have the effect of sharpening up the video edges, in this case it may be preferable to use limiting blanking.

When limiting blanking is applied the video signal is limited to the shape of the waveform shown below, i.e. the shaping waveform limits the maximum excursion of the video signal. The green CAL LED indicates multiplicative blanking, the R+ LED indicates limiting.

The green CAL LED indicates multiplicative blanking, the R+ LED indicates limiting.





(E) PAL B, G / I

There are subtle differences in the blanking position, and edge rise times between PAL I and B,G variants. This control allows selection of which variant is generated when the PAL I/B/G output standard is selected.

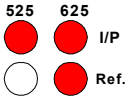
The green CAL LED indicates PAL I, the R+ LED indicates PAL B/G. This control defaults to PAL I.

(F) NORM

Holding down the ▲ and ▼ for ~5s will reset page 2 to its defaults.

4.4 Page 3 – Timing

Front panel indication:



(A) V TIMING

This applies the vertical timing offset to the output when either of the synchroniser options is fitted. The range is ±127 lines. It is only available if a synchroniser module is fitted.

The ▲ button increases the delay with respect to the reference.

The ▼ button decreases the delay with respect to the reference.

The green CAL LED indicates that the delay being inserted by the unit is less than 1 field. If both R+ and R- LEDs are illuminated, the unit is inserting more than a field of delay.

(B) H TIMING

This applies the horizontal timing offset to the output when either of the synchroniser options is fitted. The range is continuous in steps of 37ns over the range +/-127 lines. This control is only available if a synchroniser option is fitted.

The ▲ button increases the delay with respect to the reference. The ▼ button decreases the delay with respect to the reference

The green CAL LED indicates that the delay being inserted by the unit is less than 1 field. If both R+ and R- LEDs are illuminated, the unit is inserting more than a field of delay.

(C) FINE H TIMING

This applies the fine, sub-pixel, horizontal timing offset to the output when the synchroniser option is fitted. The range is continuous in steps of ~1.2ns over the range of +/-127 lines. This control is only available if a synchroniser option is fitted.

The ▲ button increases the delay with respect to the reference.

The ▼ button decreases the delay with respect to the reference

The green CAL LED indicates that the delay being inserted by the unit is less than 1 field. If both R+ and R- LEDs are illuminated, the unit is inserting more than a field of delay.

(D) SC/H

This provides an adjustment of the SC/H relationship on the output signal. The adjustment is cyclic through the whole range of ±180°. When the unit is in locking mode 0, this control applies an offset to the reference SC/H. When in locking modes 1 or 2, or when no synchroniser option is fitted, this control defines the absolute SC/H of the output. See Section E for more information on locking modes.

The CAL LEDs are standard, but the variable is only considered to be out of CAL when >10°. The R+ LED indicates an offset up to +180° and the R- to -180°.

The default for this control is 0°.

(E) LOCKING MODES

There are three locking modes available when the frame synchroniser option is fitted. These are summarised in the table below:

Mode	LED indication (cal LEDs)	Locking Mechanism
0	G	Video Locked to syncs, Sub-Carrier locked to burst. Track reference SC/H phase.
1	R+	Lock Video and Sub-carrier to burst phase, Generate known SC/H phase. Synthesised by correcting horizontal position, while maintaining burst phase.
2	R-	Lock Video and Sub-carrier to line sync. Generate known SC/H phase. Synthesised by correcting sub-carrier phase, while maintaining horizontal lock.

In locking mode 0, the unit independently locks the line position to reference syncs, and the sub-carrier to reference burst; thus maintaining reference SC/H phase at the composite output.

Locking modes 1 and 2 both force the output of the unit to a know SC/H phase, but operate in subtly different ways.

Mode 1 uses the reference burst as its main timing source, horizontally registering the output video as close to the reference h-syncs as possible while generating the selected SC/H.

Mode 2 uses the reference syncs as its main timing source, correctly re-generating the sub-carrier in accordance with the sync position.

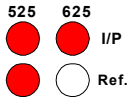
NOTE: The unit requires a black & burst reference in all locking modes.

(F) NORM

Holding down the ▲ and ▼ for ~5s will reset page 3 to its defaults.

4.5 Page 4 – Modes

Front panel indication:



(A) COLOUR/MONO

This selects which colour axes are passed: Full Colour, U Only, V Only, and Mono.

Colour Option	LED status	Direction
Mono	R+ and R-	▲
V-axis only	R-	
U-axis only	R+	
Full colour	G	▼ ← default

The green CAL LED indicates that full colour is enabled. The red LEDs indicate that one or both of the colour axes is turned OFF.

The default for this control is full colour.

(B) FREEZE PAGE 4 (MODES) B

Forces the frame synchroniser into freeze mode. The freeze is activated at the top of a field (so both fields will be stored 'clean'). This control is only available is the synchroniser option is fitted.

Freeze Option	LED status	Direction
Freeze both fields	R+ and R-	▲
Freeze field 2	R-	
Freeze field 1	R+	
Pass video	G	▼ ← default

The default for this control passes video.

(C) FS MIN. DELAY

This forces the synchroniser (if fitted) into minimum delay mode. (This effectively disables the synchroniser).

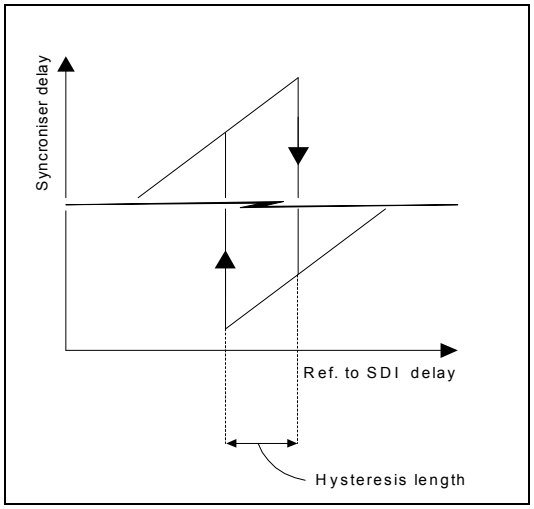
Colour Option	LED status	Direction
Minimum delay.	R+	▲
Normal synchroniser operation.	G	▼ ← default

This control defaults to normal synchroniser operation.

(D) HYSTERESIS LENGTH

The frame synchroniser (if fitted) has some hysteresis around the point of frame drop/repeat so that small amounts of relative shift between source and reference do not produce repeated picture disturbances. In some applications where there is a large amount of low frequency drift on the source (esp. when the source has been passed over a compressed link), a long hysteresis mode been provided.

The default, **short** hysteresis has a length of 5.8µs, whereas the **long** hysteresis mode has a length of 48.4µs.



Hysteresis Option	LED status	Direction
Long hysteresis (48.4µs)	R+	▲
Short hysteresis (5.8µs)	G	▼ ← default

(E) VISLOCK

Enables the VisLock option (if fitted). Vislock is only available in NTSC, and thus this control only has an effect in NTSC.

VisLock can either work in conjunction with the on board frame synchroniser, or as a standalone unit.

When used in conjunction with the frame synchroniser (and an NTSC reference is present), the synchroniser has a maximum delay of up to 66.78ms (just over 4 fields) as opposed to the usual 33.42ms (just over 2 fields). The minimum delay is not affected by the VisLock option. The delay is reflected on the delay output of the unit as described in Section 2.5. The output to reference genlocking works as normal.

When no synchroniser is fitted, or no reference is supplied, the unit operates in minimum delay mode, but the output field sequence is determined by the Vislock data embedded by a previous V1667 with the VisLock option. If no Vislock signal is present on the input video, the unit will generate a random field sequence. If the VisLock signal disappears from the input, the V1668 output sequence will remain undisturbed. However if the unit is powered up with no VisLock signal on the input, and at a later time a VisLock signal is detected, there may be a disturbance to the 4-field sequence (manifesting itself as a 180° phase shift of the sub-carrier), this disturbance to the field sequence may also occur if the source of the VisLock signal changes

When the VisLock control is turned to off, VisLock the unit behaves as though the option is not fitted at all.

The cal LEDs when the Vislock control is selected.

Vislock Option	LED status	Direction	Notes
Enabled	Green / Flashing Green	▲	Green – Vislock enabled and detected. Flashing Green – Vislock enabled but not detected.
Disabled	None	▼ ← default	

(F) NORM

Holding down the ▲ and ▼ for ~5s will reset the timing page to its defaults.

4.6 Cal Page Notes

This page allows adjustment of factory set calibrations, and should not be adjusted without the correct test equipment. These parameters should usually only be set up during factory testing, and should not be adjusted. To enter this page hold all three front panel buttons for ~5s.

Front panel indication:

(A) VIDEO LEVEL PAGE CAL A

This is a parameter used in initial production test and alignment, to calibrate the output video level. It should not be adjusted without reference to the Test Specification and suitable test equipment.

(B) BLANKING LEVEL PAGE CAL B

This is a parameter used in initial production test and alignment, to calibrate the output blanking level. It should not be adjusted without reference to the Test Specification and suitable test equipment.

(C) VCO FREQUENCY PAGE CAL C

This is a parameter used in initial production test and alignment, to centralise the VCO Frequency used when there is no signal or reference. It should not be adjusted without reference to the Test Specification and suitable test equipment.

5. APPENDIX A – CONTROL QUICK REFERENCE

PAGE		Parameter		RANGE	Default	LEDs
TOP	A	Video Gain	▲ ▼	-6dB to +3.5dB	0dB	G – cal
	B	Chroma Gain	▲ ▼	-2.5dB to +1.94dB	0dB	G – cal
	C	Black	▲ ▼	-50mV to +50mV	0mV	G – cal
	D	V Blanking	▲ ▼	Narrowing Widening	← 	 G – widest
	E	Synch Fail Mode	▲ ▼	Freeze Freeze-3s-Black Black	 ←	R- R+ G
	F	Norm. Page		Hold ▲ and ▼ for 5s		
1 (STND)	A	Standard	▲ ▼	625/50 PAL N PAL B, G, I	 ←	R+ G
			▲ ▼	525/60 PAL M NTSC JAPAN NTSC 443 NTSC M	 ←	R+, R- R- R+ G
	B	Chroma Filter	▲ ▼	Filter OFF Filter ON	 ←	R+ G
	C	Pedestal insertion (525)	▲ ▼	Disabled Enabled	 ←	R+ G
	D	VBI Pedestal insertion (525)	▲ ▼	Enabled Disabled	 ←	R+ G
	E	PAL B,G/I	▲ ▼	PAL B,G PAL I	 ←	R+ G
	F	Norm. Page		Hold ▲ and ▼ for 5s		
2 (BLNK)	A	Horizontal Blanking width	▲ ▼	Narrow Blanking Wide Blanking	 ←	R+ G
	B	VBI Horizontal Blanking width	▲ ▼	Narrow Blanking Wide Blanking	← 	G R-
	C	L23 Blank (625)	▲ ▼	Line 23 Pass Line 23 half blanked	 ←	R+ G
	D	Blanking Type	▲ ▼	Limiting Multiplicative	 ←	R+ G
	E	Not used				
	F	Norm. Page		Hold ▲ and ▼ for 5s		

PAGE		Parameter		RANGE	Default	LEDs
3 (TIM)	A	Vert. Timing	▲ ▼	Increase delay Decrease delay		G – delay < 1 field R+, R- together – Delay > 1 field.
	B	Horiz. Timing	▲ ▼	Increase delay Decrease delay		
	C	Fine Horiz.	▲ ▼	Increase delay Decrease delay		
	D	SC/H	▲ ▼	-180.0° to +180°	0°	G if < ± 10°
	E	Locking Mode	▲ ▼	Lock to burst Lock to sync Track ref. SC/H	← ←	R- R+ G
	F	Norm. Page		Hold ▲ and ▼ for 5s		
4 (MDS)	A	Colour / U/V/Mono	▲ ▼	Mono V only U only Colour	← ←	R+, R- R- R+ G
	B	Force Freeze	▲ ▼	Freeze Both Freeze field 2 Freeze field 1 Pass Video	← ←	R+, R- R- R+ G
	C	FS Min. Del	▲ ▼	Minimum delay Normal FS operation	←	R+ G
	D	Hysteresis Length	▲ ▼	Long (48.4µs) Short (5.8µs)	←	R+ G
	E	Vislock	▲ ▼	On Off	←	G – Vislock detected G Flash – Vislock not detected None
	F	Norm. Page		Hold ▲ and ▼ for 5s		
CAL	A	Video Gain	▲ ▼	Increase Video Gain Decrease Video Gain		
	B	Blank. Lev.	▲ ▼	Increase Blanking Lev Decrease Blanking Lev		
	C	VCO cntr.	▲ ▼	Increase VCO freq. Decrease VCO freq.		
	D-F	Not used				

5.1 An Introduction to Vislock Processing

(A) What is VisLock?

Vislock is a patented method of converting an NTSC composite analogue signal to serial digital form then subsequently re-converting back to NTSC with negligible loss of picture quality. This enables digital and analogue plant to be mixed in a high quality installation.

(B) How does it work?

When a composite NTSC signal is decoded it is split into its luminance and colour difference components. This process is never perfect, even using the highest quality decoders, and in practice some of the luminance picture information passes into the colour difference path. This results in spurious colour effects known as cross-colour. Also, some of the subcarrier used to convey the colour information in the original NTSC inevitably passes into the decoded luminance. This may appear as a moving dot pattern on vertical edges of coloured areas or “hanging dots” on horizontal edges.

After repeated decoding and re-encoding processes these effects increase, and the final signal may suffer significant loss of both luminance and chrominance resolution.

In the decoder the Vistek VisLock system embeds subliminal data information into its serial digital output. This data passes with the video signal to downstream encoders and provides them with information about the original NTSC signal. By using this information the encoder can re-assemble the NTSC signal exactly in the same way as it was separated.

Because of the precise separation of luminance and chrominance in the V1667 it is possible to re-assemble the NTSC signal without any significant loss of quality, even after repeated decoding and re-encoding processes.

(C) Does the added data degrade my picture?

The data is transmitted outside the analogue NTSC picture area and at a very low level. This ensures it is invisible to the viewer of the digital image.

(D) Will digital equipment in the path pass the VisLock signal?

As the Vislock data is integrated within the active picture area of the serial digital video signal, it is transmitted accurately through most professional digital video plant including switchers, routers, synchronisers, audio embedders and de-embedders, caption and logo inserters etc.

Certain equipment such as standards converters and effects generators may destroy the relationship between subcarrier and line frequency such that after processing it is impossible to accurately re-assemble the NTSC signal. However, these units often significantly reduce many of the re-encoding impairments.

(E) How is VisLock Implemented?

The Vistek V1667 decoder and V1668 encoder modules are now available with VisLock, no additional equipment is required. The V1667 decoder converts the NTSC to serial digital (SDI) format and inserts the VisLock data. When the serial digital signal is subsequently converted back to NTSC in a VisLock compatible V1668 encoder the added data is read and the signal timed to ensure that optimum encoding quality is achieved and the signal timed to the genlock reference signal.

6. FAQ

Symptom	Possible problem
Teletext is not being passed correctly or at all.	Check vertical blanking control see Section 4.1(D). Check horizontal blanking width during vertical interval see Section 4.3 (B).
Timing adjustment options appear in menu structure but do not adjust output timing.	Reference may not be present (check front panel LED). Unit may be in Minimum Delay mode see Section 4.5 (C).
Timing adjustment options do not appear in menu structure (skipped over).	Unit does not have frame synchroniser option fitted.
No output from CVBS 4.	See link settings in Rear Panel Connections table.
No reference loop through	See link settings in Rear Panel Connections table.
Reference level low, when externally terminated.	Check on board termination link. See Rear Panel Connections table.
Output frozen	Check SDI source is present (SDI I/P front panel LED). Check unit is not forced into freeze mode - Section 4.5 (B).
Output SC/H not as expected.	Check SC/H offset adjustment. See Section 4.4 (D). Check locking mode. See Section 4.4 (E). *NOTE: in locking modes 1&2 output SC/H is not related to ref. SC/H.*
Video edges excessively sharp when unit fed with pre-blanked input.	Set unit into either limit-blanking mode. See Section 4.3. Set horizontal blanking to narrow. See Section 4.3.
NTSC missing set-up	Check NTSC set-up control. See Section 4.2 (C). Check standard (NTSC-J has no set-up). See Section 4.2.
NTSC set-up double amplitude	Input may have set-up already applied. Switch off pedestal insertion. See Section 4.2 (C).
Wide screen signalling not passed.	Check line 23 blanking. See Section 4.3 (C).