



PHABRIX SxE

Additional Features Manual

RELEASE INFORMATION

Software Release: 0.10.0040

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OPERATION

TURNING THE UNIT ON OR OFF


To turn on your PHABRIX Sx press the red button at the top right hand side of the unit.

Once the system has started, pressing the button for a few seconds will turn it off. If for some reason the unit stops responding, pressing and holding the button for a few seconds will turn it off.

The unit is battery operated and the battery should last for between 2 and 4 hours dependent on which video standard is being used and whether the input and outputs are active. If the unit is turned ON and the battery is almost discharged, it will turn itself OFF. If the battery level starts to get too low for operation a dialog will be displayed prompting the user to turn off the unit. The current settings will also be saved. The unit should then be connected to the power supply unit as soon as possible to recharge the battery. The battery should be fully charged in about 4 hours. The battery will charge faster if the unit is turned off while charging.

If AC power is removed from the unit a dialog will be displayed asking if you wish to turn the unit off. If there is no response within 10 seconds the unit will automatically switch off. This feature reduces the chance of an SxE battery being fully discharged due to power failure etc.

UNIT STATUS LINE



In: 525i59 AES Ok Out: 625i50 Lock: Free [Battery icon] 16:34

The top line of the menus shows the unit status and includes the input video status, AES input status, genlock status, battery status and current time. If a command script is being run, this is shown on the top line to the left of the time as "Script". A red "Log" is shown on the status line if there are any events in the event log.

The input video standard will be shown in red if the input signal has errors, but only if the analyser is connected to the input. If the analyser is set to monitor the output, the input standard will be shown in brown.

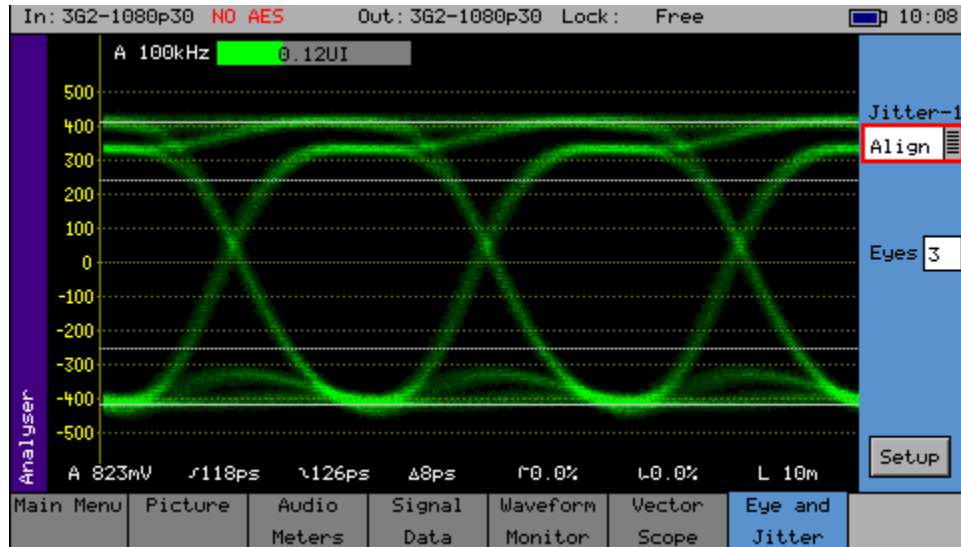
The AES input status will be shown in red if there is no input

The output standard will be shown in red if the unit is generating errors.

USING THE MENUS

The Menu keys select which instrument is in use as well as selecting the options for the unit. The bottom of the LCD display shows the function of each Menu Key.

When in a specific function e.g. GENERATOR, ANALYSER etc, the cursor controls on the right hand of the unit select a field to edit. The current field has a red box around it. Pressing the OK button starts or ends editing of that field. Check boxes are always in edit mode and pressing the OK button inverts the current state. When editing some types of fields, the menu buttons at the bottom take on different functionality to allow cancelling edit mode or setting the default value for the field. When lists of options are displayed the menu buttons allow selection of the first/last item in the list as well as paging through the available options. If the list of items is small, the available items may be displayed on the menu buttons for instant access. The buttons along the bottom of the LCD display change the currently displayed page when not editing a data field. The left hand button always selects the top level menu and system overview page.



In the standard SxE this screen provides a 3-eye display along with continuous automatic measurements for:

- Amplitude
- Rise time
- Fall time
- Rise/fall difference
- Rising edge overshoot
- Falling edge overshoot
- Cable length

Any measurements which exceed the specification of the SDI signal are indicated in RED whilst valid parameters are displayed in WHITE.

NOTE: If jitter values are too large, the automated measurements cannot be made accurately and should NOT be relied on.

The rise and fall time measurements are specified as the time between the 20% and 80% points on the eye waveform.

The cable length display is only an approximate value with 10m resolution thus a 5m cable will be shown as 0m long. The cable type affects the length displayed which has been calibrated for Belden 1694A cables.

The eye display is only accurate when connected via a 1m cable, if a longer cable is used the eye will begin to 'close up' and measurements will become harder to perform. Note that the eye display is of the signal pre-equaliser, the equalizer in a system being used to compensate for long cable lengths. There is no method for the SxE to view the signal post-equaliser.

Four horizontal cursor lines are displayed showing the 100%, 80%, 20% and 0% measurement positions on the waveform.

Jitter-1: Selects either Timing or Alignment Jitter filters. Jitter filter selection affects both the jitter thermometer and eye pattern displays. Timing and Alignment jitter filters are defined in the relevant SMPTE publication. The thermometer automatically calibrates to the specification of the video standard and chosen filter. When reading is in specification the thermometer bar is GREEN, when close to specification it is YELLOW, and when out of specification it's RED.

	3G-SDI (2.97Gbps)	HD-SDI (1.485Gbps)	SD-SDI (270Mbps)
Alignment Jitter	100 KHz high pass	100 KHz high pass	1 KHz high pass
Timing Jitter	10 Hz high pass	10 Hz high pass	10 Hz high pass
Upper limit	-3 dB at 9.5 MHz low pass	-3 dB at 4.75 MHz low pass	-3 dB at 0.86 MHz low pass

On screen horizontal cursors indicate where on the eye the rise time measurements are being made.

Please note that the unit takes a little time to stabilise when the SDI input standard changes.

JITTER METER RANGES

	3G-SDI (2.97Gbps)	HD-SDI (1.485Gbps)	SD-SDI (270Mbps)
Alignment Full-Scale	0.52UI	0.34UI	0.34UI
Alignment (Red Threshold)	0.3UI	0.2UI	0.2UI
Alignment (Yellow Threshold)	0.2UI	0.14UI	0.14UI
Timing Full Scale	3.4 UI	1.7UI	0.34UI
Timing (Red Threshold)	2UI	1UI	0.2UI
Timing (Yellow Threshold)	1.4UI	0.7UI	0.14UI

Setup: This button shows a dialog box that allows the eye colour and cable type to be specified.

With the Advanced Jitter Analysis option the eye colour may be set to green or blue and may also be adjusted in gain to allow the eye display to show 'hotspots' where the majority of the signal data is found.

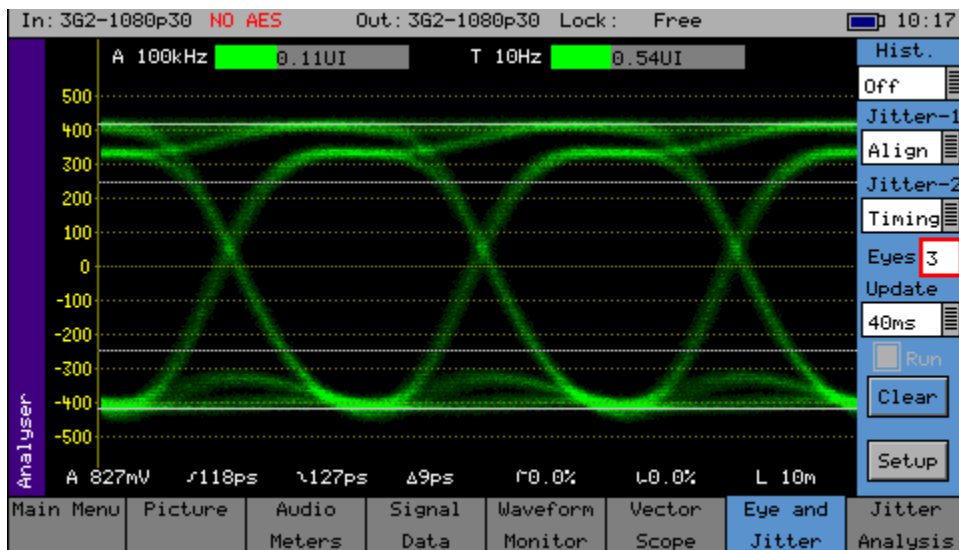
The cable type affects the length displayed which has been calibrated for Belden 1694A cables.



Cable: Selects the cable type used which affects the cable measurements.

B8281	Belden 8281
B1505	Belden 1505
B1694A	Belden 1694A
B1855A	Belden 1855A
CL5CSB	Canare L-5CFB
I-1000	Image 1000

ADVANCED JITTER ANALYSIS FEATURES (OPTIONAL EXTRA)



The Advanced Jitter Analysis option provides the user with additional tools on the Eye display to help determine the nature of jitter present in SDI signals.

Histogram: Amp/Timing/Both. Histograms enable the operator to observe the distribution of samples in both amplitude (Amp) and time (Time). The amplitude histogram shows the distribution of samples over the complete visible eye picture. The time histogram shows the distribution of samples at the zero point of the eye waveform for two thirds of the visible time period.

Note: The time histogram overlays some of the automatic measurement display. The measurements may still be read by Remote Control if purchased.

Jitter-1: Timing/Align/10Hz/100 Hz/1KHz/10KHz/100KHz. This filter operates on both the left hand jitter thermometer and the eye waveform. The different filters enable the operator to understand more fully the nature of any jitter present. When in Timing or Alignment modes, the meter range is set to show appropriate ranges for the SMPTE specification at the current video input standard. When in other filter modes, the meter ranges are expanded so that larger ranges may be viewed.

Jitter-2: This is a second jitter measurement thermometer and may be set to Timing/Align/10Hz/100Hz/1KHz/10KHz/100KHz. This filter operates on just the right hand jitter thermometer. When in Timing or Alignment modes, the meter range is set to show appropriate ranges for the SMPTE specification at the current video input standard. When in other filter modes, the meter ranges are expanded so that larger ranges may be viewed.

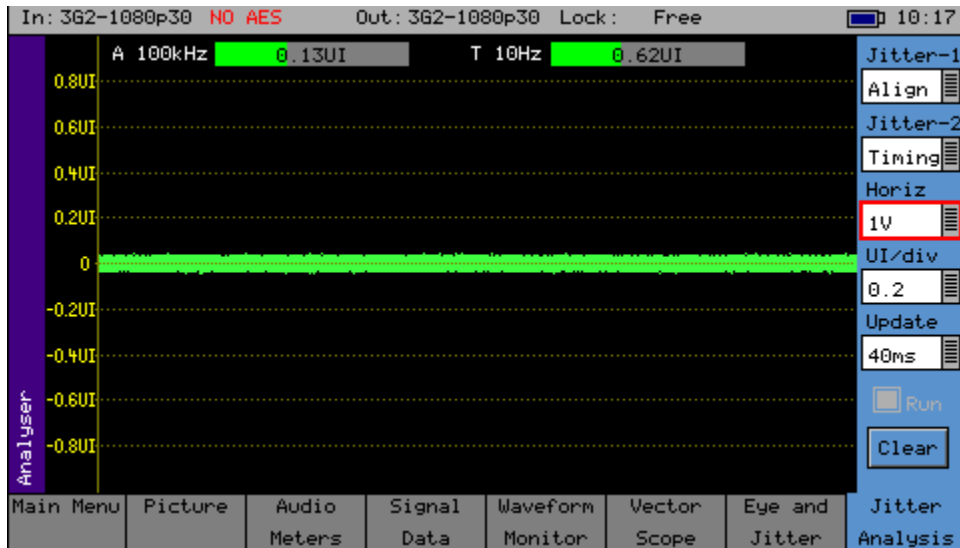
Update: This allows selection of the update rate to allow longer display persistence. This may be set to 40ms (normal use) or infinite. When set to infinite, the Run and Clear buttons are enabled.

Run: This check box stops the display from updating so that a waveform may be investigated in more detail. It is only enabled when the update mode is set to infinite update mode.

Clear: This button clears the eye display. It is only enabled when the update mode is set to infinite update mode.

Eyes: 1/2/3/4/5/10/20/H/2H/V/2V. This parameter adjusts the number of eyes visible on the eye display. The 10 and 20 modes are useful for observing serial-parallel conversion jitter, the H, 2H, V, and 2V are useful for observing the effects of power supply born video synchronous noise in SDI signals. (H/2H/V/2V not yet implemented)

JITTER ANALYSIS (PART OF ADVANCED JITTER ANALYSIS OPTION)

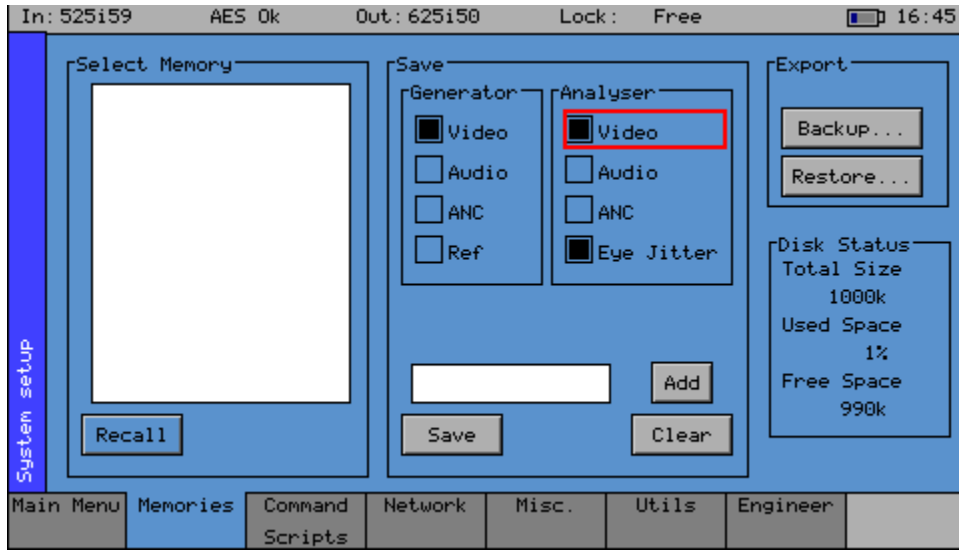


The Advanced Analysis package provides a jitter display. This screen shows a trace of jitter amplitude versus time along with two jitter thermometers and has the following controls:

- Jitter-1:** Timing/Align/10Hz/100Hz/1KHz/10KHz/100KHz. This filter operates on both the left hand jitter thermometer and the jitter trace.
- Jitter-2:** Timing/Align/10Hz/100Hz/1KHz/10KHz/100KHz. This filter operates on just the right hand jitter thermometer.
- Horiz:** H/2H/V/Frame – horizontal sweep control for jitter trace.
- UI/div:** 0.1/0.2/0.5/1.0 – vertical gain control for the sweep trace.
- Update:** This allows selection of the update rate to allow longer display persistence. This may be set to 40ms (normal use) or infinite. When set to infinite, the Run and Clear buttons are enabled.
- Run:** This check box stops the display from updating so that a waveform may be investigated in more detail. It is only enabled when the update mode is set to infinite update mode.
- Clear:** This button clears the eye display. It is only enabled when the update mode is set to infinite update mode.

SYSTEM WIDE SETTINGS

MEMORIES



On the SxE, an additional check-box 'Eye Jitter' is available for the analyser section. This allows memories with just Eye Jitter settings to be stored.

LOGGING

Logging allows events to be detected and recorded for future examination. The events to be logged can be specified so that unwanted events do not appear in the event log. If a system has a problem with intermittent signals, the PHABRIX Sx can be connected to that source and can be left for several days to log any errors. At the end of that period the log can be examined and the time and date of each error noted.

The error log is saved when the unit is powered off and may be downloaded from the unit via FTP or the Web Browser.

In: 525159 AES Ok Out: 625150 Lock: Free 16:47

Jitter Thresholds		Eye Timings		Eye Amplitude	
Level					
Jitter - 1	0.20UI	<input type="checkbox"/> Rise Time	<input type="checkbox"/> Amplitude	<input type="checkbox"/> Over-shoot	<input type="checkbox"/> Under-shoot
Jitter - 2	0.20UI	<input type="checkbox"/> Fall Time	<input type="checkbox"/> Rise-Fall Time		
	<input type="checkbox"/> Log				
	<input type="checkbox"/> Log				

Logging

Main Menu Events Log Setup Log Eye Jitter Clear Log

The events to be logged are set up on this page by checking the appropriate 'Log' checkboxes.

JITTER THRESHOLDS

The jitter level at which an event is added may be set independently for each meter. (Only one meter provided as standard) This allows you to set the maximum allowed jitter level and then test for invalid values over a period of time.

A different jitter threshold may be set for each of the 3 SDI data rates (SD/HD/3G) for both Jitter1 and Jitter2. The defaults are the maximum values specified by the SMPTE standard.

Jitter errors are detected within 200ns and so intermittent peak errors can be detected.

EYE TIMINGS

If checked, these controls will enable logging of invalid timing values. An event will be logged if the value exceeds the valid SMPTE range and an event will be logged when the signal becomes valid again.

Eye measurements are performed using statistical calculations on the waveforms and are thus performed at a slower rate than jitter measurements. Measurements can take a few seconds to stabilise and this should be taken into account.

EYE AMPLITUDE

If checked, these controls will enable logging of invalid amplitude or over-shoot/undershoot values. An event will be logged if the value exceeds the valid SMPTE range and an event will be logged when the signal becomes valid again.

Eye measurements are performed using statistical calculations on the waveforms and are thus performed at a slower rate than jitter measurements. Measurements can take a few seconds to stabilise and this should be taken into account.