



## Application Note

# GEN-Clocks™ Clock and Timing Generators: Selecting an Appropriate Companion Sync Separator

The use of a 'Genlock' (short for Generator Lock) circuit as a part of video sources within a broadcast studio, is fundamentally important for ensuring synchronisation between multiple autonomous video sources.

The GS49xxB GEN-Clocks family of clock and timing generators can dramatically simplify the implementation of typical Genlock circuits in broadcast video source designs.

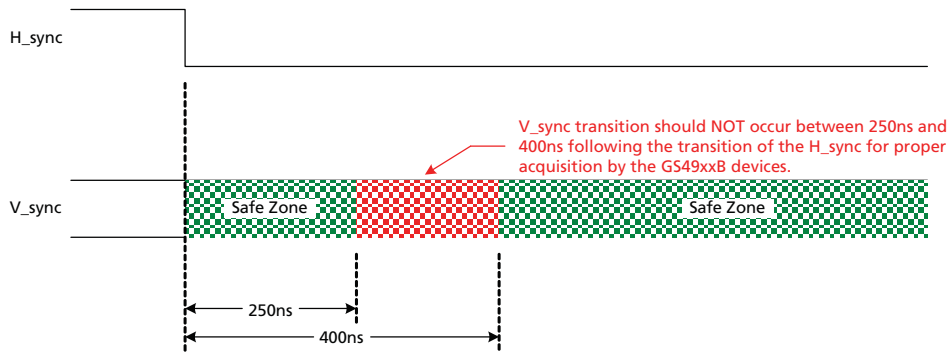
The GS49xxB devices require discreet reference timing in the form of horizontal, vertical and field/frame sync pulses provided to the input of the part. These reference timing inputs provide the devices with a standard input to which the output clocks and timing can be locked to generate a synchronised system.

The reference timing in a typical studio setting is typically passed from source to source by means of an analog 'master house reference', which comes in the form of a tightly controlled analog composite video signal.

In order to separate the horizontal, vertical and field/frame timing information 'embedded' in the analog composite video signal into discreet horizontal, vertical and field/frame sync pulses that can be used by the GS49xxB devices, a device called a sync separator is required.

Selecting a sync separator that will interface properly to the GS49xxB is critically important to ensure robust and reliable operation of the Genlock circuit in the design. The timing of the horizontal, vertical and field/frame sync pulses that are output from the sync separator must meet certain criteria.

Figure A below shows the specific, critical timing relationship between the horizontal (H\_sync) and vertical (V\_sync) sync pulses required at the reference inputs of the GS49xxB.



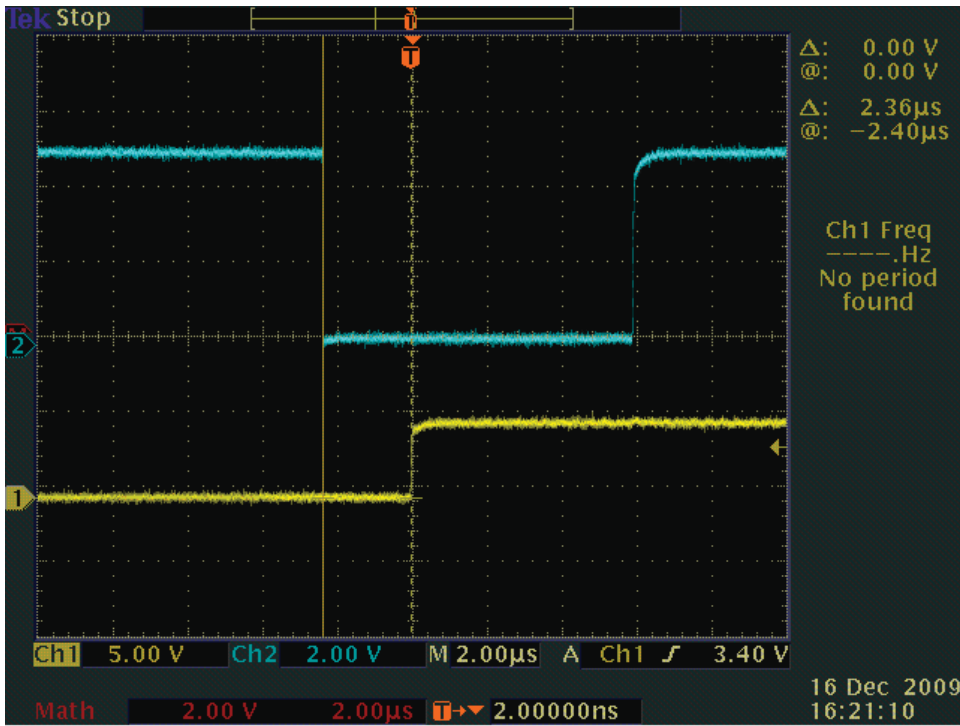
**Figure A: Reference Timing Input Requirements**

The transition of the vertical sync pulse must fall outside a window from 250ns to 400ns following the transition of the horizontal sync pulse to ensure that the change in the vertical sync pulse is properly registered by the GS49xxB.

Different manufacturers use different integration time constants in their sync separators for determining when the output timing signals transition, and therefore the timing relationship between the transition of the horizontal sync pulse and the vertical sync pulse will be different for different manufacturer's devices.

Genum has thoroughly characterised/validated two popular sync separator devices for use with the GS49xxB devices. Those sync separators are the Genum GS4982 and the Intersil/Elantec EL4511.

Figure B below shows the relationship between the horizontal sync pulse and vertical sync pulse coming out of the Genum GS4982. The cyan scope trace is the horizontal sync pulse, and the yellow scope trace is the vertical sync pulse.



**Figure B: GS4982 Horizontal Sync to Vertical Sync Relationship**

Figure C below shows the relationship between the horizontal sync pulse and vertical sync pulse coming out of the Intersil/Elantec EL4511. Once again, the cyan scope trace is the horizontal sync pulse and the yellow scope trace is the vertical sync pulse.



## Revision History

Version	ECR	Date	Changes and/or Modifications
1	153481	January 2010	Updates.
0	153410	January 2010	New document.

### DOCUMENT IDENTIFICATION

#### APPLICATION NOTE

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#### ELECTROSTATIC SENSITIVE DEVICES

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