

# Eye Pattern Wave Test Report

## SDI 1 X 2 Distribution & Amplifier/Extender

Test Instrument : PHABRIX SxE  
Eye and Jitter

Cable: BELDEN 1694A-RG6

A: Generate SDI Signal

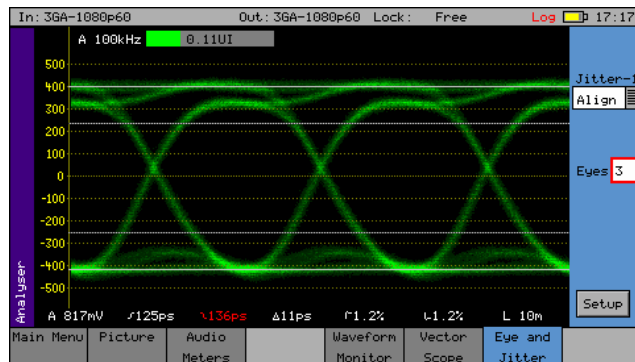
B: SDI Signal Input

Test	Device	Cable B	Cable A	Eye Pattern	Video
①	Direct	1 M		0.11	Yes
②	Direct	150 M		0.00	No Video
③	SDE-122R [with reclocking]	1 M	150 M	0.23	Yes
④	SDE-122 [W/O reclocking]	1 M	150 M	0.28	Yes

- ① A 1m [BELDEN 1694A](#) RG-6 cable was attached to the output of the [Phabrix SxE](#) SDI video signal test device to generate a 3G-SDI pattern, and to the input which receives the signal and analyses the eye pattern and jitter of the signal. (Fig. 1) A snapshot was taken of the result of this control test. (Fig. 2)



**Eye Pattern 0.11**

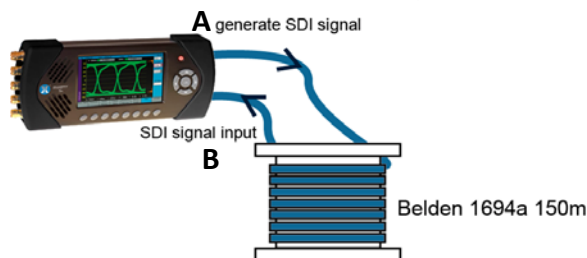


**Jitter:** the undesired deviation from true periodicity of an assumed periodic signal in electronics and telecommunications, often in relation to a reference clock source.

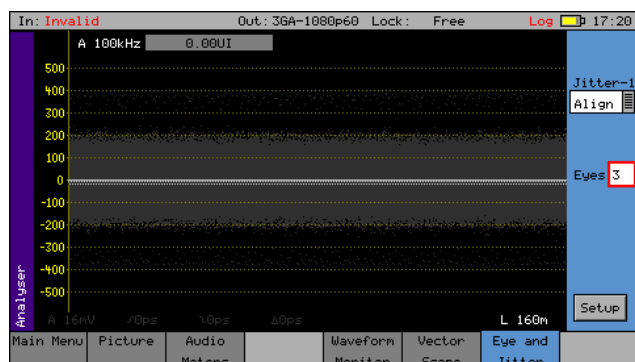
**Eye Pattern:** A diagram display on oscilloscopes used to show and analyze digital signals.

The number **0.11** on the top is the Jitter rate. A signal for a cable this short should be **no more than 0.2UI**

- ② Next a 150m BELDEN 1694 RG-6 cable was attached the output and input of the Phabrix SxE (Fig. 4) and another snapshot was taken of the result. (Fig. 5)



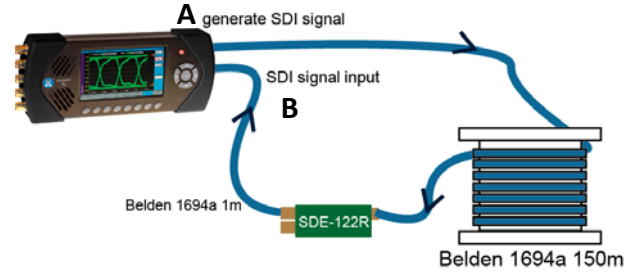
**Eye Pattern 0.00**



The signal that came from the test device did not reach the receiving end, since the distance of 150m was too long and the signal had attenuated so much, the meter could not produce an eye pattern or analyze the jitter.

**0.00 UI**

- 3 The SDE-122R SDI HD video extender (with re-clocking) was attached at the downstream end of the 150m cable and a 1m cable attached the SDE-122R to the input of the Phabrix SxE. (Fig. 6) The amplified signal can be seen below. (Fig. 7)



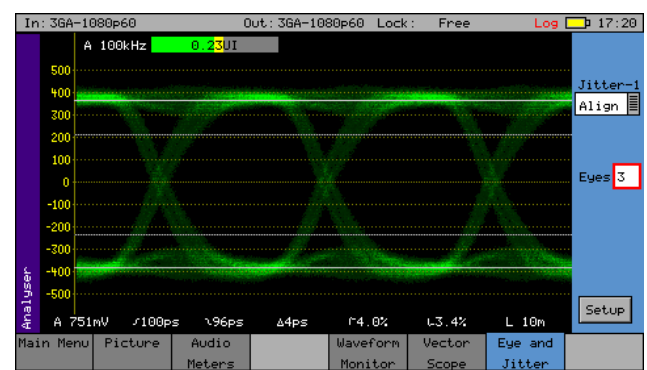
**Reclocking:** Can be thought of as "refreshing" or "regenerating" a signal.

When a clock signal is run over a long length of cable it can suffer degradation. If this degradation becomes too severe the clock signal can be rendered unusable.

To prevent this, a reclocking device can be inserted in the signal chain. This device uses the incoming signal as a template to regenerate a new signal with the same characteristics.

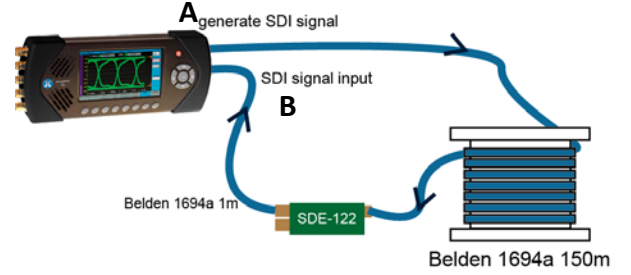
J\*st as y#u ar"st!!\*&ble to re\*d th)s garbled sentence and correct it in your head, a reclocking device can read incoming clock signals with missing information and rewrite them in their originally intended form.

**Eye Pattern 0.23**

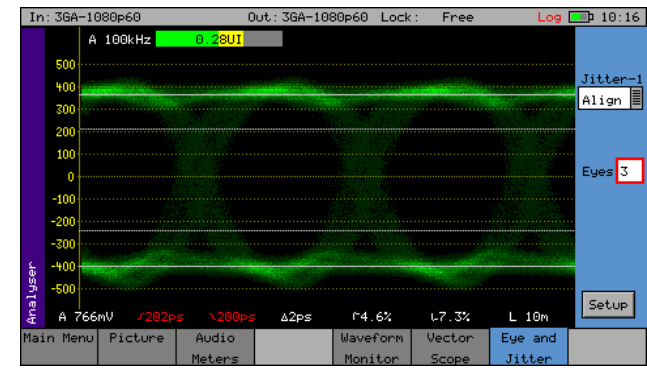


The test device now has a usable signal that can be analyzed, and as you can see, only has a jitter of **0.23UI**

- 4 The following test is using SDE-122 (without reclocking)



**Eye Pattern 0.28**



Even without the reclocking function, the SDI Extender is able to amplify the SDI signal and let the test equipment detect and analyze the signal whereas before, it could not through this length of cable. A jitter of **0.28UI**

**NOTE: Why use Phabrix SxE instead of using an HD Camera for this test?**

Because the HD cameras on the market do not have a standard SDI quality or uniform signal whereas the extender will boost an HD camera signal, this test used a uniform signal from the test device to show jitter readings through the different lengths of cable and how well the extender devices can improve the signal.