SDG MODEL 12040 AND 12050

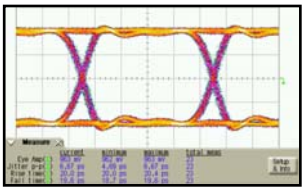
PROGRAMMABLE PATTERN GENERATOR

PRELIMINARY PRODUCT SPECIFICATION

Features:

- **Available in 8Gb/s** (Model 12040) **and 12.5Gb/s** (Model 12050) **versions**
- **Programmable data rate, amplitude, offset, and crossing point**
- **Differential data, pattern trigger, clock/n, and full rate clock outputs**
- **Built-in random and sinusoidal jitter insertion option**
- **PRBS and user defined patterns**
- **Single bit error insertion for testing error measurement setups**
- **Front panel touch screen GUI or USB computer control**

PatternPro™ *Line of Serial Data Test Instruments*



Output Performance:

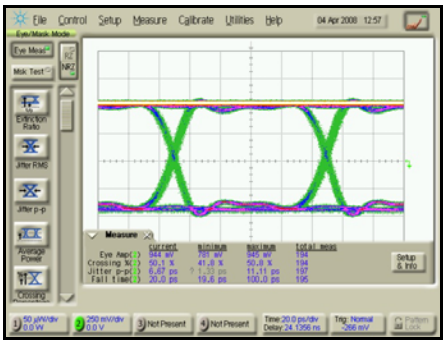
- **25ps typical 10% to 90% rise/fall times**
- **250mV to 2.0V output amplitude**
- **-2.0V to 3.0V offset window**
- **35% to 65% programmable crossing point**

Applications:

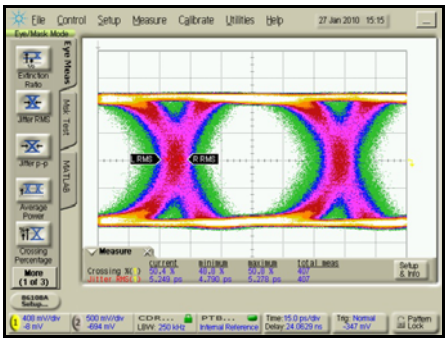
- **High-speed serial data testing**
- **Semiconductor device and component testing**
- **R&D design verification**

The Picosecond Pulse Labs' **SDG Model 12040** and **SDG Model 12050** are high performance, fully programmable instruments. These pattern generators feature high-performance DC coupled limiting amplifiers that result in accurate, fast risetime data signals. In addition, the 12040 and 12050 provide many useful test features such as a **built-in jitter insertion option** and single bit error injection.

DC coupled output with consistent performance across all amplitude, offset, and data conditions. Built-in programmable jitter insertion option for flexible stressed eye testing.



Accurate eye diagram at 87.5% mark density ratio.



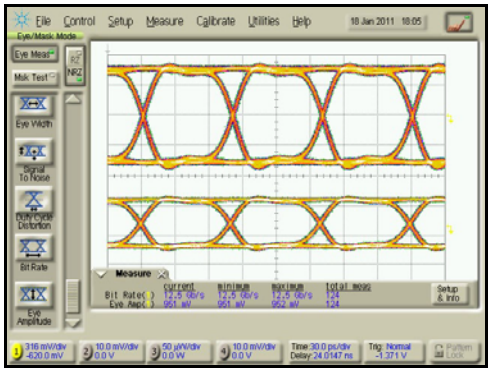
Stressed eye with built-in random jitter insertion.

Specifications:

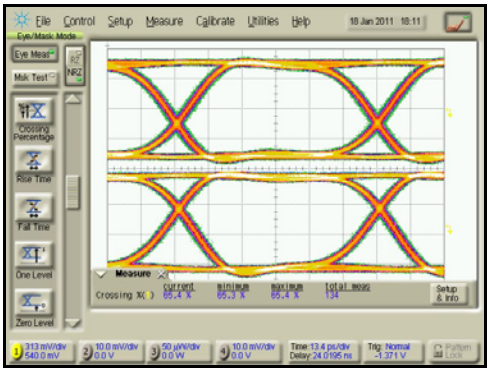
Description:	Value/Details	Notes
Data Outputs:		*Differential/complimentary output.*
Amplitude Single ended Differential	 250mV to 2.0V 500mV to 4.0V	*Positive and negative differential outputs are independently programmable.*
Offset	-2.0V to +3.0V window	*Programmable/adjustable*
Termination Voltage	-2.0V to +3.3V	*Programmable/adjustable*
Crossing point adjust range	35% to 65% typ.	*Programmable/adjustable*
Risetime 20% to 80% 10% to 90%	 17 ps typ. 25 ps typ.	
Total Jitter	1 ps RMS typ.	Measured with 2^7-1 PRBS.
Output impedance	50 Ω single ended	100 Ω differential
Other Outputs:		
Trigger/Divided Clk	Swings from –600mV to 0V	*User selectable as pattern trigger or clock/n (user selected n). DC coupled.*
Clock signal Amplitude Jitter	 400mVpp typ. <1 ps RMS typ.	*AC coupled*
Inputs:		
External clock input	400mVpp typ. 1Vpp max	*AC coupled. Operates over range of 6.25GHz to 12.5GHz.*
Pattern Generator:		
Data rate Model 12040 Model 12050	 500 Mb/s to 8 Gb/s 800 Mb/s to 12.5 Gb/s	*Data rate is programmable from front panel or computer control.*
Frequency resolution	10kHz	
Built-in PRBS patterns	2^n-1	*n = 7, 15, 23, 31*
User defined pattern depth	512 kbit	
Single bit error injection	Yes	
User Interface:		
Front panel touch screen GUI	Yes	*Edit output, patterns, and instrument setup.*
Computer programmable Interface	Yes USB	

Ordering Information	
Model 12040	8Gb/s Programmable Pattern Generator
Model 12040-J	8Gb/s Programmable Pattern Generator with Jitter Insertion Option
Model 12050	12.5Gb/s Programmable Pattern Generator
Model 12050-J	12.5Gb/s Programmable Pattern Generator with Jitter Insertion Option

Amplitude may be programmed between 250mV and 2V.
Crossing Point may be programmed from 35% to 65%.

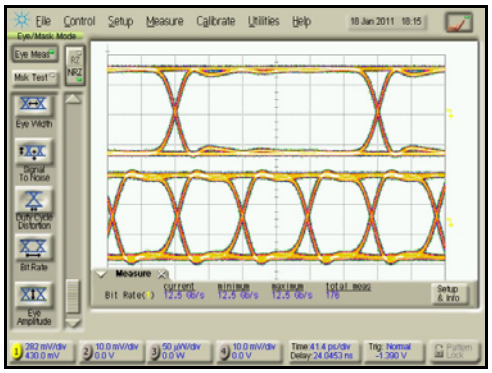


1V and 500mV programmed data outputs.

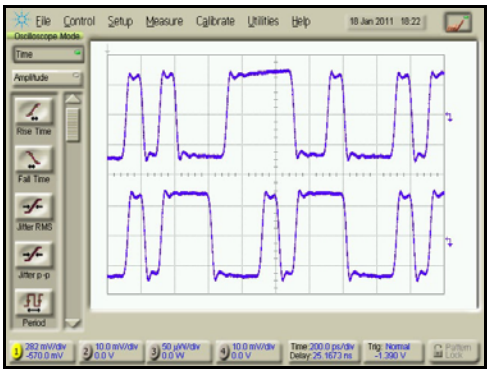


35% and 65% programmed data crossing point.

Data rate may be programmed via an internal low jitter clock source.
Output may be either built-in PRBS patterns or programmed user data patterns.

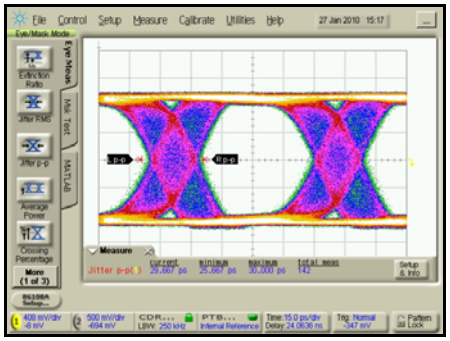


4Gb/s and 12.5Gb/s programmed data rates.

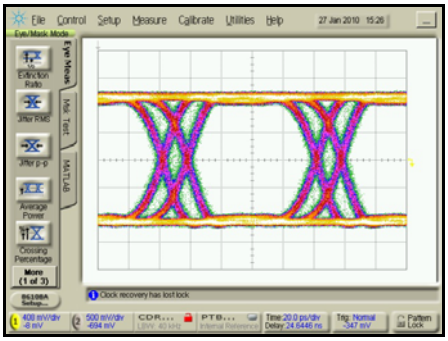


Built-in PRBS and programmed user data outputs.

Jitter insertion option provides up to 200ps of jitter modulation amplitude.
Jitter modulation sources may be built-in sources (sine, random) or an external input.



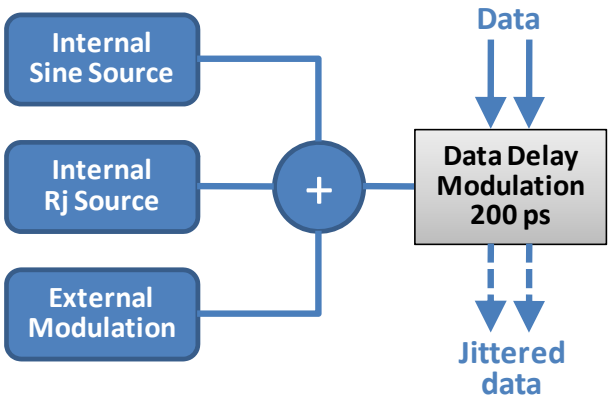
Stressed eye with built-in sinusoidal jitter insertion.



Stressed eye with external square wave modulation.

Jitter Insertion Option Information:

- **200 picoseconds of modulation range**
  - Equals 1.6 UI at 8 Gb/s
  - Equals 2.5 UI at 12.5 Gbps
- **Built-in sinusoidal modulation source**
- **Built-in random modulation source**
- **900MHz modulation bandwidth**
- **Input for external modulation sources**
- **Front panel touch screen GUI or USB remote control programming**



Jitter Insertion Option Block Diagram

The Picosecond Pulse Labs' **SDG Model 12040** (8GHz) or **SDG Model 12050** (12.5GHz) pattern generators may be ordered with a built-in jitter insertion option. This jitter insertion option provides an easy to use feature that can be programmed from within the pattern generator controls (touch screen GUI or USB/remote). Built-in modulation sources (random, sine) minimize the need for additional equipment and facilitate fast, efficient jitter tolerance testing.

Jitter Insertion Option Specifications:

Description:	Value/Details	Notes
Total modulation range	200 ps_{pk-pk}	*Peak to peak range of jitter modulation for all sources combined (internal or external).*
Built-in sine source Frequency range Maximum programmable amplitude	 5 kHz to 200 MHz 200 ps_{pk-pk}	*Programmable from either front panel touch screen GUI or remote control.*
Built-in random noise modulation source Maximum programmable amplitude	 25 ps RMS	*Programmable from either front panel touch screen GUI or remote control.*
External modulation input Frequency range Range Max input	 1 kHz to 900 MHz 200 ps_{pk-pk} *2* V_{pk-pk}	*AC coupled. 3 dB bandwidths. 2* V_{pk-pk} *input equals modulation of* 200 ps_{pk-pk}.

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