

Pattern Generator BPG28G / BPG 32G



Pattern Generator BPG 32G

Key Features

- Wide-band Pattern Generator for Binary NRZ Pulses at Data Rates from 1 to 28 Gbps
- 128 MBit Memory for User Programmable Pattern of Variable Pattern Length
- Complementary Data Outputs with Adjustable Output Amplitude
- Jitter-transparent for Jitter Tolerance Testing
- Compact Desktop Design with Low Power Consumption and Low Fan Noise
- Optionally available:
 - Internal Synthesizer
 - Extended Pattern Memory of 256 Mbit or 512 MBit
 - Other Customizer Specific Features on Demand

Brief Description

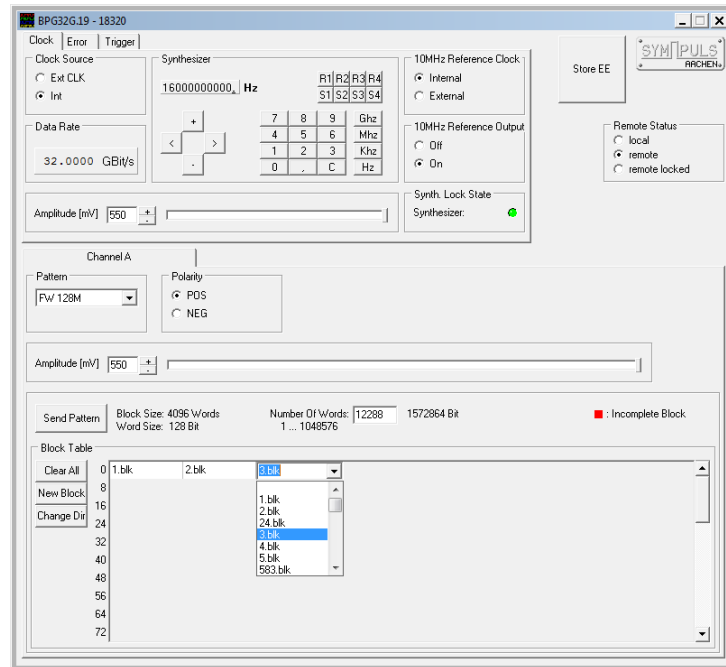
The pattern generator BPG 32G is an universal test instrument for electronic components in the picosecond range and ultra-fast communication systems. Signals with bit rates between 200 Mbps and 32 Gbps can be generated. An external clock signal is needed to provide the time base for operation. The generator is jitter-transparent and follows even abrupt frequency changes.

Eight different patterns are selectable: Pseudo random binary sequences (PRS) of $2^7 - 1$, $2^9 - 1$, $2^{11} - 1$, $2^{15} - 1$, $2^{23} - 1$ and $2^{31} - 1$ bit length and structure according to CCITT standards, one short user pattern of 128 bit length and a long user pattern of 134 217 728 bit length (128 MBit), programmable over the instruments USB interface. Optionally an extended pattern memory of 256 Mbit and 512 MBit is available.

Each bit can be set to a positive pulse or to zero and the length of the user pattern is configurable from 128 bit up to 134 217 728 bit. The programmed bit sequence is then generated periodically. Additionally the pattern memory can be split in 2 or 4 parts to toggle synchronously between different waveforms.

At the front panel complementary data signals (NRZ and /NRZ), several clock signals and a word frame trigger signal are available.

Single and programmable error sequences can be added to the data outputs over the error input.



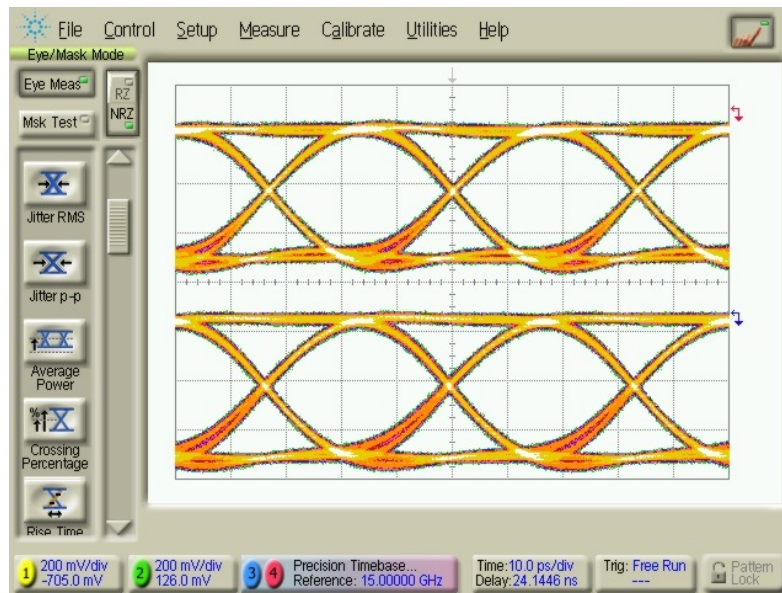
Graphical User Interface

The instrument can be operated locally via the front panel or remotely controlled via its USB-interface. An easy-to-use graphical user interface is included in the supplied software and allows simple operation by mouse-clicking. Additionally self-programmed software may be used to control the instrument.

Output Signals

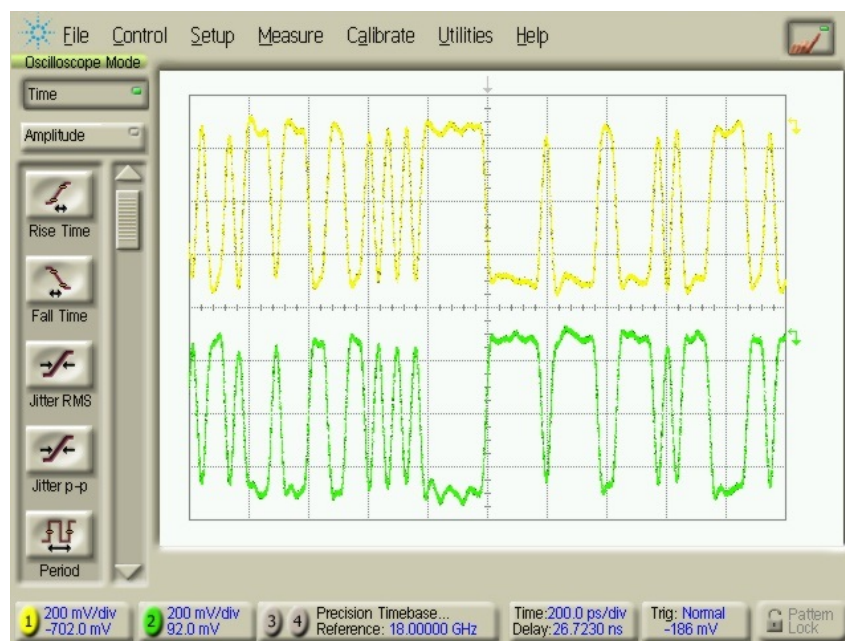
All oscillograms taken using Agilent 86100B sampling oscilloscope with sampling module 86118A (70 GHz cut-off frequency).

Eye Pattern of the Complementary Output Signals at 30 Gbps



OUTPUT SWING 200 mV/div, TIME 10 ps/div, PRBS of Length $2^{31} - 1$

PRBS $2^7 - 1$ at 32 Gbps



OUTPUT SWING 200 mV/div, TIME 200 ps/div

Technical Specifications

BPG28G / BPG 32G	
Bit Rate	200 Mbps ... 28 Gbps, gap free
Clock Input	100 MHz ... 14 GHz (External Clock = Bit Rate/2) $U_i = 0.5 \dots 1 V_{pp}$, $R_i = 50 \Omega$, 50Ω SMA, $ r < 0,2$ 6 bit frequency display
Pulse Patterns	1. PRBS: $2^{31} - 1$, $2^{23} - 1$, $2^{15} - 1$, $2^{11} - 1$, $2^9 - 1$, $2^7 - 1$ 2. User Programmable Pattern 128 Bit, Manually Programmable via Front Panel 3. User Programmable Pattern 128 * m Bits ($m = 1, 2, \dots, 2^{20}$) (=max. 134217728 bit), Programmable via USB-Port 4. User Patterns Consisting of Two Parts, Each of Length 128 * m Bits ($m = 1, 2, \dots, 2^{19}$), Programmable and Synchronously Selectable via USB-Port (Two Waveform Mode) 5. User Patterns Consisting of Four Parts, Each of Length 128 * m Bits ($m = 1, 2, \dots, 2^{18}$), Programmable and Synchronously Selectable via USB-Port (Four Waveform Mode) Long User Patterns only Programmable via USB Interface.
Data Outputs	1. NRZ, 50Ω 2.92 mm (K) 2. /NRZ, 50Ω 2.92 mm (K) Adjustable Output Amplitude ($-0.5 V \dots 0.25 V$)/0 V into 50Ω Rise / Fall time < 20 ps (10/90%) Jitter (rms) < 1 ps Polarity Reversible.
Clock Outputs	Clock/2 and /(Clock/2), $0.5 V \pm 0.1 V$, AC-Coupled, 50Ω 2.92 mm (K) Data to Clock Skew ± 10 ps
Trigger Output	1. CML: 0 V / -0.4 V into 50Ω SMA Clock/16 or Word Frame trigger selectable, Pulse width: 64 clock periods 2. TTL Word Frame Trigger: 0 V / +3 V SMA (on rear panel) Trigger frequency according to chosen pattern, pulse width selectable: 1024, 2048, 3072 or 4096 clock periods

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Error Addition	Programmable: 10^{-4} , 10^{-4} , ..., 10^{-10} Single Error: Push Button External: Error Addition via external signal connected to AUX Input. Data threshold adjustable.
AUX Input	SMA Connector Threshold -4000 mV ... +4000 V, Resolution 10 mV Input Swing $100\text{ mV}_{pp} \dots 5\text{ V}_{pp}$ Impedance $1\text{ k}\Omega$ Bandwidth 100 MHz
Interface	High Speed USB Max. Data Transmission Rate 8 MByte/s
Software	Graphical User Interface for Operation and Pattern Programming
Dimensions	19" Desktop W x H x D = 462 x 135 x 435 mm
Weight	approx. 8 kg
Power Supply	100 V-240 V/50 Hz-60 Hz/65 VA

Optionally Available

Option 1: Extended Data Rate

Bit Rate	200 MBps ... 32 Gbps, gap free
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Option 2: Internal Synthesizer

Internal or External Clock Selectable	
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Frequency Range	200 MHz to 16 GHz
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Frequency Resolution	5 Hz
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10 MHz Reference Input	$U_i = 1V_{pp} \dots 3V_{pp}$
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10 MHz Reference Output	$1.5V_{pp}$, 50 Ω SMA, AC-coupled
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Option 3: Extended Pattern Memory of 256 Mbit

Pattern Memory	268 435 456 Bits
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Pattern Length	$128 * m$ Bit ($m = 1, 2, \dots, 2^{21}$)
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Option 4: Extended Pattern Memory of 512 Mbit

Pattern Memory	536 870 912 Bits
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Pattern Length	$128 * m$ Bit ($m = 1, 2, \dots, 2^{22}$)
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Option 5: Full Clock Input

Input Frequency	1 GHz ... 32 GHz (External Clock Rate = Data Rate)
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Full-clock and *half-clock* input selectable

Ordering Information

SYMPULS GmbH

Römerstr. 39
D-52064 Aachen

Phone: +49 241 35334

Fax: +49 241 35335

Email: mail@sympuls-aachen.de

Internet: www.sympuls-aachen.de

Included in delivery:

- BPG 28G / BPG 32G
- 115/230 V Mains, User Manual, USB Cable Set
- CD-ROM with Device Drivers and Operating Software

**The instrument is produced by SYMPULS in Germany.
We offer a reliable service and 24 month warranty.**