

PRECISION

NOISE

GENERATORS

(AWGN)



### General Specifications:

Output	White Gaussian noise
Crest factor	18 dB minimum
Output noise power	+3 dBm
Noise attenuator range	0 to 63 dB in 0.25 dB steps
Noise attenuator accuracy	±0.2 dB or 0.5% at 1 - 500 MHz ±0.2 dB or 1% at 0.5 - 1.0 GHz ±0.3 dB or 2% at 1 - 2 GHz
Signal path gain	0 ±1 dB
Group delay variation	±0.2 ns/40 MHz
Standard connectors	BNC female
Dimensions	17 in. wide x 5.25 in. high x 12.5 in. deep
Mounting	Front panel handles and fold-down feet for bench mounting. Brackets included for 19 in. rack mounting
Power	115 VAC, 60 Hz (230 VAC, 50 Hz optional)
Operating temperature	-10°C to +60°C

Specifications subject to change without notice.

The *PNG7000 Series* instruments generate additive white Gaussian noise and provide a summing input to perform signal-to-noise or carrier-to-noise ratio testing capability. A key feature of this instrument is its low distortion signal path which sums the user-supplied signal with the internal precision white noise source.

The signal path has a nominal insertion gain of 0 dB, with very low amplitude and phase ripple. The noise source provides an exceptionally high crest factor of 18 dB for accurate bit error rate testing, even

with large carrier-to-noise (CNR) or bit energy-to-noise density ( $E_b/N_o$ ) ratios. With option 7 (DC instead of AC coupled) signal path, the *PNG7000* can add noise directly to a digital TTL, ECL, or similar signal that operates in a 50-ohm system.

The standard *PNG7000* is a broadband device. For applications in which the frequency range is limited, the unit can be configured with up to five band-limited noise sources, each optimized for flatness over the specified frequency band.

The *PNG7000 Series* is microprocessor-controlled and continually provides information about operation of the instrument on a 4 x 20 character LCD display. The instruments allow control of the noise level, noise on/off, signal on/off, and noise source selection in three ways: at the front panel keypad, remotely via IEEE-488 bus, or automatically under program control.

The *PNG7000* instruments can be integrated into a test station under software control (Lab Windows drivers are available from National Instruments) and with the aid of a precision power meter, carrier-to-noise ratios can be set.

Once a CNR calibration has been performed, the ratio can be changed using the internal precision attenuator to vary the noise power without degrading accuracy. The output noise power level is factory calibrated at a 0 dB attenuator setting and is displayed in dBm/Hz.

Every front panel operation except instrument on/off is programmable, and the user can create up to nine test routines that can run automatically under program control. These routines can include delay times and loops, and can be executed manually or via bus control. The routines are easily written using the program key, and information on the display guides the user through the next steps.

#### Applications:

- C/N Ratio Testing
- $E_b/N_o$  Testing
- AWGN
- CCITT G.95
- SONET
- Data regenerators
- Multiplexers
- Hard disk drives

PNG7000 SERIES					
MODEL	FREQUENCY RANGE	POWER (dBm)	OUTPUT CHARACTERISTICS		
			V <sub>rms</sub>	dBm/Hz	FLATNESS(dB)
PNG7105	1 MHz - 10 MHz	+3	0.316	-67	±0.25
PNG7107	10 MHz - 100 MHz	+3	0.316	-77	±0.25 / 40 MHz
PNG7108	10 MHz - 500 MHz	+3	0.316	-84	±0.25 / 40 MHz
PNG7109	10 MHz - 1 GHz	+3	0.316	-87	±0.25 / 40 MHz
PNG7110	10 MHz - 1.5 GHz	+3	0.316	-89	±0.25 / 40 MHz
PNG7111	1 GHz - 2 GHz	+3	0.316	-87	±0.25 / 40 MHz
PNG7112	10 MHz - 2 GHz	+3	0.316	-87	±0.25 / 40 MHz

OPTIONS	
Option Number	Description
PNGopt01	SMA female input and output
PNGopt02	75 ohms input and output impedance
PNGopt03	230 VAC, 50 Hz
PNGopt04	Switch including up to 5 noise sources
PNGopt05	RS232 in addition to standard IEEE-488 interface
PNGopt06	127 dB signal attenuator in 1 dB steps
PNGopt07	DC coupled signal path (6 dB RF Loss)

Lab Windows Drivers available  
from National Instruments

To order call 201-261-8797