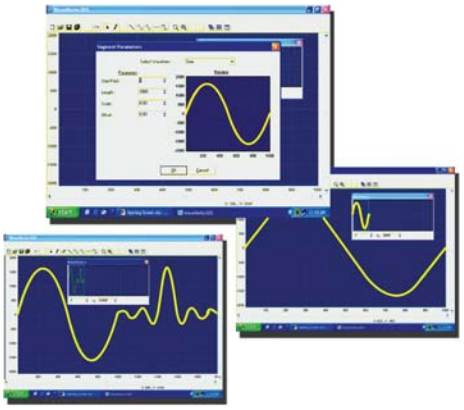
FUNCTION/ARBITRARY WAVEFORM GENERATORS

- Largest Waveforms (4 MB)
- Fastest Rise Time (6 ns)
- Widest Bandwidth (50 MHz)
- Single & Dual Channel
- Function Generator Simplicity
- Intuitive User Interface
- Unmatched Waveform Precision
- Programmable Synchronization
- AM/FM/FSK Modulation
- User-Definable Pulse
- Three-Year Warranty

2700A Hybrid Series – Single & Dual Channel Function/Arbitrary Waveform Generators



Custom waveforms may be imported or created using Waveworks DDS software, downloaded to the 2700A hybrid series, and reproduced in seconds.

TEGAM combines the best of both worlds in signal generation by introducing the new 2700A hybrid series, function/arbitrary waveform generators. Direct Digital Synthesis (DDS) and True Arbitrary Waveform generators each have unique advantages relative to signal generation and performance. Until now, the user had to make a choice between the two.

The 2700A hybrid series is designed with the low cost, ease of use, sweep and modulation capabilities of the DDS architecture while maintaining the ability to produce true arbitrary waveforms with unprecedented accuracy and resolution. The 2700A hybrid design is a breakthrough in low cost signal generation.

Highest Resolution & Speed

Create and generate high-speed, standard or user-defined waveforms ranging from 1 µHz to 50 MHz. Any of the 2700A hybrid series is ideal for replacement of traditional function, sine, pulse or sweep generators with the addition of true arbitrary waveform capabilities. Using a proprietary design, the 2700A hybrid series combines the simplicity of a function generator with the precision of a true arbitrary waveform generator. It outperforms the alternatives by offering core design advantages that make a difference. These include 14-bit vertical resolution, up to 4 MB segmentable RAM, 0.01 S/s – 125 MS/s sampling, programmable marker (sync) pulse, sine waves to 50 MHz, sweeps from 10 ms to 500 s, internal/external modulation and more.

Standard Wave Types

Commonly used waveforms are easily defined via the intuitive front panel. The instruments' function generator mode produces standard sine, square, triangle/ramp and pulse waveforms. User-definable parameters include frequency, amplitude, offset, phase, duty cycle, and rise/fall.

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Models 2720A, 2725A, 2730A, & 2732

FUNCTION/ARBITRARY WAVEFORM GENERATORS

Arbitrary Wave Creation

WaveWorks™ DDS software is a valuable tool for creating and downloading arbitrary waveforms to the 2700A hybrid series function/arbitrary waveform generators. It has the capability to import wave data directly from popular Agilent, LeCroy, and Tektronix oscilloscopes via the GPIB or RS-232C interfaces or from *.txt file types. WaveWorks™ DDS includes nine predefined wave templates, point-by-point editing, insert functions, and other tools to make wave creation the way it should be… simple.

In addition, arbitrary waveforms may be created through the instrument's front panel by point editing or use of standard arbitrary wave profiles. These include sine, Gaussian, triangle, square, noise, ramp up, ramp down, sin(x)/x, exponential up, and exponential down. Once the arbitrary wave data is written to the instrument's RAM, it is executed with precision. There is no unwanted digital processing that could compromise wave replication as with traditional DDS designs.

Ideal for Pulse Generation

Create pulse waveforms with repetition rates from 0.5 mHz to 25 MHz. Vary the width, rise or fall time of a standard pulse waveform with the turn of a dial or numerical entry. Alternatively, you can create a customized pulse through use of the instrument's arbitrary wave functions. Using two arbitrary data points, the 2725A can produce a pulse rise/fall time as low as 6 ns with repetition rates to 62.5 MHz!

Extended Waveform Memory

Don't let waveform memory restrictions compromise the integrity of your waveform. Other waveform generators limit the maximum size of arbitrary waveforms to kilobytes. At higher sample speeds, the integrity of your waveform can be compromised. The 2700A hybrid series addresses this problem by offering up to 4 MB of non-volatile RAM for arbitrary waveform storage. It executes wave data with true arbitrary precision with no interpolation and no skipping or repeating of waveform data.

Exceptional Value

The 2700A hybrid series function/arbitrary waveform generators provide exceptional value through performance and quality. No other function/arbitrary generator matches the cost/benefit advantage of these instruments.

TEGAM offers a three-year warranty and a 30-day, no-risk trial period for any of the three selections. Contact a TEGAM representative to learn more about the 2700A hybrid series or our other high-performance, waveform solutions.

Some Applications Include:

Aerospace, Automated Test Systems, Communications, Education, Medical, MEMS, Military, Research and Development, and Sensor Excitation/Simulation.

Included Accessories:

- 120 VAC Line Cord
  - P/N 161006600
- RS-232C Cable (6 ft)
  - P/N 740565-6
- User Manual CD
  - P/N 810050-CD for 2720
  - P/N 810051-CD for 2725
  - P/N 810052-CD for 2730
  - P/N 2732-901-01CD for 2732
- WaveWorks™ DDS Software CD
  - P/N 200024

Optional Accessories:

- Single Unit Rack Kit
  - P/N 2701
- Dual Unit Rack Kit (Photo Below)
  - P/N 2702
- BNC Cable (3 ft)
  - P/N CBL-3102
- BNC Tee Connector
  - P/N BNC-3285
- USB-RS232C Converter
  - P/N 1000001
- User Manual Printed Version
  - P/N 810050 for 2720
  - P/N 810051 for 2725
  - P/N 810052 for 2730
  - P/N 2732-901-01 for 2732
- Heavy Duty GPIB Cables
  - P/N 1583-3 (3 ft)
  - P/N 1583-6 (6 ft)
  - P/N 1583-9 (9 ft)

LabVIEW Driver available.

Two or more units can be synchronized for multiple channel operation. Phase offfsets can be programmed by the user and precisely maintained by using the fully-programmable marker outputs.

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Models 2720A, 2725A, 2730A, & 2732

FUNCTION/ARBITRARY WAVEFORM GENERATORS

Specifications

	2720A	2725A	2730A (One-Channel) 2732 (Two-Channel)
Function Generator Waveforms			
Sine	10 µHz to 31 MHz	1 µHz to 40 MHz	1 µHz to 50 MHz
Square	10 µHz to 31 MHz	1 µHz to 40 MHz	1 µHz to 50 MHz
Triangle (Ramp)	10 µHz to 500 kHz	1 µHz to 5 MHz	1 µHz to 5 MHz
Pulse	.5 mHz to 10 MHz	.5 mHz to 10 MHz	.5 mHz to 25 MHz
Accuracy	0.002 % (20 ppm)	0.002 % (20 ppm)	0.002 % (20 ppm)
Resolution	10 digits (10 µHz)	12 digits (1 µHz)	12 digits (1 µHz)
Arbitrary Waveforms			
Storage	1 Waveform-Segmentable	1 Waveform-Segmentable	1 Waveform-Segmentable
Horizontal Resolution	2 to 500,000 points	2 to 1,000,000 points	2 to 4,000,000 points
Vertical Resolution	12 bits (-2,047 to + 2,047)	14 bits (-8,191 to + 8,191)	14 bits (-8,191 to + 8,191)
Sampling Rate	0.02 S/s to 50 MS/s (20 ns to 50 s)	0.01 S/s to 80 MS/s (12.5 ns to 100 s)	0.01 S/s to 125 MS/s (8 ns to 100 s)
Sampling Resolution	4-digits resolution (limited to 10 ps) and 0.002 % accuracy.	4-digits resolution (limited to 1 ps) and 0.001 % accuracy.	4-digits resolution (limited to 1 ps) and 0.001 % accuracy.
Predefined Arbitrary Waveforms	• sine • triangle • square • noise	• sine • ramp up • exp down • triangle • ramp down • Gaussian • square • sin (x)/x • noise • exp up	• sine • ramp up • exp down • triangle • ramp down • Gaussian • square • sin (x)/x • noise • exp up
Waveform Characteristics			
Analog Filters	9 pole Elliptic 5 pole Bessel	9 pole Elliptic 5 pole Bessel	9 pole Elliptic 5 pole Bessel
Harmonic Distortion	DC to 100 kHz -60 dBc 100 kHz to 1 MHz -45 dBc 1 MHz to 15 MHz -35 dBc 15 MHz to 30 MHz -25 dBc	DC to 20 kHz -65 dBc 20 KHz to 100 MHz -60 dBc 100 kHz to 5 MHz -45 dBc 5 MHz to 40 MHz -30 dBc	DC to 20 kHz -65 dBc 20 kHz to 100 kHz -60 dBc 100 kHz to 5 MHz -45 dBc 5 MHz to 50 MHz -30 dBc
Spurious	DC to 1 MHz < -65 dBc	DC to 1 MHz <-65 dBc	DC to 1 MHz < -65 dBc
Square Rise/Fall	< 12 ns (10 % to 90 %) at full amplitude into 50 Ω.	< 8 ns (10 % to 90 %) at full amplitude into 50 Ω.	< 6 ns (10 % to 90 %) at full amplitude into 50 Ω.
Duty Cycle	20 % to 80 % to 5 MHz 40 % to 60 % to 20 MHz	20 % to 80 % to 10 MHz 40 % to 60 % to 30 MHz	20 % to 80 % to 10 MHz 40 % to 60 % to 30 MHz
Symmetry at 50 %	< 1 %	< .5 %	< .5 %
Overshoot	< 2 % of p-p ±50 mV	< 3 % of p-p ±50 mV	< 3 % of p-p ±50 mV
Amplitude & Offset			
Amplitude Range	10 mV to 10 Vp-p, 50 Ω	10 mV to 10 Vp-p, 50 Ω	10 mV to 10 Vp-p, 50 Ω
Resolution	3-1/2 digits	3-1/2 digits	3-1/2 digits
Accuracy	1 % ±20 mV (1 V-10 V)	1 % ±20 mV (1 V-10 V)	1 % ±20 mV (1 V-10 V)
Flatness	0.2 dB at 1 MHz 0.5 dB at 20 MHz	0.1 dB at 10 MHz 1.0 dB at 40 MHz	0.1 dB at 10 MHz 1.0 dB at 50 MHz
Offset range, resolution, and accuracy are dependent upon the amplitude setting.			
Offset Range	±4.5 V into 50 Ω	±4.99 V into 50 Ω	±4.99 V into 50 Ω
Offset Resolution	3 digits, 10 mV	3 digits, 10 mV	3 digits, 10 mV
Offset Accuracy	1 % ±10 mV	1 % ±10 mV	1 % ±10 mV
Amplitude range, resolution, and accuracy are dependent upon the offset.			
Operational Modes			
Continuous	Output runs continuously.	Output runs continuously.	Output runs continuously.
Triggered	Output quiescent until triggered (internal, external, GPIB or manual), then one waveform period is generated. Up to 10 MHz trig rate for ARB wave forms and 5 MHz in DDS mode.	Output quiescent until triggered (internal, external, GPIB or manual), then one waveform period is generated. Up to 20 MHz trig rate for ARB waveforms and 10 MHz in DDS mode.	Output quiescent until triggered (internal, external, GPIB or manual), then one waveform period is generated. Up to 20 MHz trig rate for ARB waveforms and 10 MHz in DDS mode.
Gated	Same as triggered mode except waveform is executed for the duration of the gated signal. The last waveform period started is completed.	Same as triggered mode except waveform is executed for the duration of the gated signal. The last waveform period started is completed.	Same as triggered mode except waveform is executed for the duration of the gated signal. The last waveform period started is completed.
Burst	Same as triggered mode for waveform periods from 1 to 99,999.	Same as triggered mode for waveform periods from 2 to 999,999.	Same as triggered mode for waveform periods from 2 to 999,999.
Phase	-360º to +360º (0.1º resolution)	-360º to +360º (0.1º resolution)	-360º to +360º (0.1º resolution)

Models 2720A, 2725A, 2730A, & 2732

FUNCTION/ARBITRARY WAVEFORM GENERATORS

Specifications	2720A	2725A	2730A (One-Channel) 2732 (Two-Channel)
Trigger Sources			
Internal			
Repetition	0.01 Hz to 1 MHz	0.01 Hz to 1 MHz	0.01 Hz to 1 MHz (Typical)
Resolution	4 digits	4 digits	4 digits
Accuracy	±0.002 %	±0.002 %	±0.002 %
External	Front panel, rear panel BNC	Front panel, rear panel BNC	Front panel, rear panel BNC
Outputs			
Output Impedance	Front Panel/50 Ω	Front Panel/50 Ω	Front Panel/50 Ω
Synchronous Output	+ TTL pulse at selected F, 50 Ω	+ TTL pulse at selected F, 50 Ω	+ TTL pulse at selected F, 50 Ω
Reference Output	10 MHz, TTL	10 MHz or ARB clock, TTL	10 MHz, or ARB clock, TTL
Inputs			
Trigger Input	TTL, 1 kΩ nominal Z, Max. 10 MHz, minimum width 50 ns.	TTL, 10 kΩ nominal Z, Max. 20 MHz, minimum width 20 ns.	TTL, 10 kΩ nominal Z, Max. 20 MHz, minimum width 20 ns.
Modulation Input	5 Vp-p for 100 % modulation, 10 kΩ input Z, DC to >20 kHz bandwidth.	5 Vp-p for 100 % modulation, 10 kΩ input Z, DC to >50 kHz bandwidth.	5 Vp-p for 100 % modulation, 10 kΩ input Z, DC to >50 kHz bandwidth.
Reference Input	TTL, 10 MHz	TTL, 10 MHz	TTL, 10 MHz
Summing Input	N/A	5 Vp-p maximum	5 Vp-p maximum
Modulation Characteristics			
Amplitude Modulation			
Internal	0.01 Hz to 20 kHz sine, square or triangle. Variable depth from 0 % to 100 %.	0.01 Hz to 20 kHz sine, square or triangle. Variable depth from 0 % to 100 %.	0.01 Hz to 20 kHz sine, square or triangle. Variable depth from 0 % to 100 %.
External	5 Vp-p for 100 % modulation	5 Vp-p for 100 % modulation	5 Vp-p for 100 % modulation
Frequency Modulation			
Internal	0.01 Hz to 20 kHz sine, square or triangle.	0.01 Hz to 20 kHz sine, square or triangle.	0.01 Hz to 20 kHz sine, square or triangle.
External	5 Vp-p for 100 % deviation	5 Vp-p for 100 % deviation	5 Vp-p for 100 % deviation (Typical)
FSK Internal	0.01 Hz to 1 MHz.	0.01 Hz to 1 MHz.	0.01 Hz to 1 MHz.
External	1 MHz max.	1 MHz max.	1 MHz max.
Sweep Characteristics			
Sweep Type	Linear and logarithmic	Linear and logarithmic	Linear and logarithmic
Sweep Time	20 ms to 500 s.	10 ms to 500 s.	10 ms to 500 s.
Sweep Trigger	Internal, external, continuous or burst	Internal, external, continuous or burst	Internal, external, continuous or burst
Computer Interface			
GPIB	IEEE 488.2 SCPI compatible		
RS-232C	115 k baud, max.		
Wave Creation Software	WaveWorks DDS™, Wave Creation Software for Windows™ is included at no additional charge.		
General			
Operating Temperature	32 ºF to 122 ºF (0 ºC to 50 ºC)		
Front Panel Storage	49 full panel settings		
Dimensions			
Bench Top	Height: 99.06 mm (3.9 in)	Width: 226.10 mm (8.9 in)	Length: 327.70 mm (12.9 in)
Rack Mount	Height: 88.90 mm (3.5 in)	Width: 213.40 mm (8.4 in)	Length: 299.70 mm (11.8 in)
Weight	2.2 kg (4.9 lbs)		
Power	110/220 V, ±15 % (93-256 V) 40 VA max.		
Humidity	0 to 95 % RH, 32 ºF to 86 ºF (0 ºC to 30 ºC)		
EMC	EN55011, EN 55082		
Safety	EN61010, CE Marked		

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