TEGAM

New Products

MODELS 3101 & 3102

- Single channel (Model 3101), or Dual independent channels (Model 3102).
- Generates standard waveforms including sine, square, triangle, and ramp.
- Arbitrary wave programming includes standard waves plus exponential rise/fall, damped sine, line, and free hand. Noise output also available.
- Windows®-based software speeds the creation and uploading of arbitrary waveforms.
- Wide frequency range of 0.01 Hz to 31 MHz, with 0.01 Hz resolution.
- Logarithmic, linear & phase continuous sweep modes.
- Amplitude, frequency, phase, and burst modulation.
- Sweep times up to 1,000 seconds.
- 16,348 data point, storable waveforms with 12 bits of vertical resolution, and outputs of up to 40 M samples/second.
- Standard RS-232 or optional GPIB interface.
- Two year limited warranty on parts and labor.
- CE approved.

Model 3101
Single-Channel Function/ ARB Function Generator

Model 3102
Dual-Channel Function/ ARB Function Generator

Up to 31 MHz Synthesized Standard and Arbitrary Waveforms

The TEGAM Model 3101 and Model 3102 Synthesized Function/ARB Waveform Generators are easy-to-use instruments capable of creating a virtually unlimited variety of waveforms. Both instruments can generate standard sine waves, square waves, triangle waves, and ramps, as well as arbitrary waveforms and noise. Frequency range is 0.01 µHz to 31 MHz for sine and square waves, 0.01 µHz to 2 MHz for triangle and ramp, and 10 MHz (fixed) for noise. The Model 3101 is a single-channel instrument, while the Model 3102 provides dual, isolated channels

TEGAM

YOUR GLOBAL SOURCE FOR TEST AND MEASUREMENT SOLUTIONS

MODELS 3101 & 3102

Single (3101) & Dual-Channel (3102) Function/ARB Function Generators

that can be programmed and operated independently.

The Model 3101 and Model 3102 Synthesized Function/ARB Waveform Generators excel in their flexibility for creation, modulation, and output of waveforms. Arbitrary waveforms can be defined in "Point" or in "Vector" modes. In Point mode, up to 16,384 amplitude points can be stored in the generator's RAM to define a waveform. In vector mode, a series of data, x (position) and y (value) pairs, are defined by the user. The undefined points between adjacent x,y pairs are filled in as a straight line. Maximum resolution of arbitrary waveforms is 12 bits for amplitude (x axis), and 16,384 bits over time (y axis).

Amplitude, frequency, or phase modulation can be applied to standard or arbitrary waveforms through the use of internal modulation generators. Amplitude modulation is also possible through an external source. The burst mode enables up to 65,000 wave cycles of a standard or arbitrary waveform to be output, and may be initiated by an internal, external, or line trigger signal.

The generator's waveform output ranges from 50 mV to 10 V p-p, into a 50 Ω load. These outputs may be floated up to 40 V above ground for coupling to other circuits. Each channel includes a TTL-level trigger output that can be used to synchronize external circuits or instruments to the start of waveforms. A DC offset adjustment is also provided. The rear panel includes connectors for sweep, triggering, external time base, oscillator, and modulation, facilitating a wide range of operating and control configurations.

Both the Model 3101 and 3102 contain a built-in RS-232 interface, which can communicate at speeds up to 19200 baud; a GPIB interface is optional. The Waveform Composer software enables you quickly design and download arbitrary waveforms to the Model 3101 or 3102 for storage and output. Both generators feature an uncluttered pushbutton user interface with numeric keypad. A two-line alphanumeric, LCD display shows waveform parameters.

Specifications

Waveform Specifications

Standard: Sine, Square, Triangle, Ramp, Noise, ARB

Arbitrary: Sine, Square, Triangle, Ramp, Damped Sine, Exponential Rise, Exponential Fall, DC, Noise, Freehand, and Line.

Output Frequency Range and Resolution Characteristics

Sine and Square: 1 µHz to 31 MHz, 0.01 µHz resolution

Ramp and Triangle: 1 µHz to 2 MHz, 0.01 µHz resolution

Noise: 1 µHz to 10 MHz, 64 bits resolution

Output Characteristics:

Output: Model 3101: 1 channel
Model 3102: 2 independent channels

Channel Crosstalk: < 0.05% (Model 3102 only)

Source Impedance: 50 Ω, floating

Amplitude: 50 mV p-p to 10 V p-p into a 50 Ω load

WAVEFORM	Vp-p		Vrms		DBm	
Function	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
Sine	10 V	50 mV	3.535 V	17.68 mV	+23.97	-22.05
Square	10 V	50 mV	5 V	25.00 mV	+26.98	-19.04
Triangle	10 V	50 mV	2.886 V	14.43 mV	+22.20	-23.82
Ramp	10 V	50 mV	2.886 V	14.43 mV	+22.20	-23.82
Noise	10 V	50 mV	2.09 V	10.45 mV	+19.40	-26.62
Arbitrary	10 V	50 mV	N/A	N/A	N/A	N/A

Specifications (continued)

Resolution: 3 digits (DC offset = 0 V)
Sine Wave Accuracy: (0 V DC offset)

	0.01 µHz < 100 kHz	100 kHz < 20 MHz	20 MHz < 25 MHz	25 MHz < 31 MHz
6 V – 10 V p-p	±0.2 dB	±0.3 dB	±0.6 dB	±0.9 dB
0.05 V – 5 V p-p	±0.4 dB	±0.4 dB	±0.8 dB	±0.8 dB

Square Wave Accuracy:

	0.01 µHz < 100 kHz	100 kHz < 20 MHz	20 MHz < 31 MHz
6 V – 10 V p-p	±3%	±6%	±15%
0.05 V – 5 V p-p	±5%	±8%	±16%

Triangle, Ramp, Arbitrary Accuracy:

	0.01 µHz < 100 kHz	100 kHz < 2 MHz
6 V – 10 V p-p	±4%	±8%
0.05 V – 5 V p-p	±5%	±9%

DC Offset:

Range: ±5 Vdc (limited such that |Vac peak| + |Vdc| < 5 V)
Resolution: 3 digits (Vac = 0)
Accuracy: ±1.5% of setting + 0.5 mVdc / ±80 mV depending on AC and DC settings
Output Units: Vp-p, Vrms, dBm, %
Sync Output: Front Panel TTL Output for each channel

Sine Wave Spectral Purity

Spurious Components: < -50 dBc (non-harmonic)
Phase Noise: < -50 dBc in a 30 kHz band centered on the carrier, exclusive of discrete spurious signals
Sub Harmonics: < -50 dBc
Harmonic Distortion: DC to 1 MHz: < -45 dBc
1 MHz to 31 MHz: < -32 dBc

Signal Characteristics

Square Wave:

Rise/Fall Time: < 15 nsec (10 to 90%)
Asymmetry: < 1% of period + 4nS
Overshoot: < 5%

Ramp, Triangle and Arbitrary:

Rise and fall time: <35 nS
Linearity: 0.5% of full scale output
Settling time: <1 µS to settle within 0.1% of final value at full output

Arbitrary Waveforms:

Sample rate: 40 MHz/n where n=1 to 234-1
Memory length: 16 to 16,384 points
Resolution: 12 Bits

Phase:

Range: ±9999.99°
Resolution: 0.01°

Modulation Characteristics

Amplitude Modulation:

Source: Internal (sine, square, triangle, ramp or arbitrary), or external
Depth: 0 to 100% AM or ±100% DSBSC
Rate: 0.001 Hz to 10 kHz internal, 20 kHz max. external
Distortion: < -35 dB at 1 kHz, 80% depth
DSB Carrier: < -35 dB typical at 1 kHz modulation rate (DSBSC)
Ext: input: ±5 V for 100% modulation, 100 kΩ

TEGAM

MODELS 3101 & 3102

Specifications (continued)

Frequency Modulation:

Source:	Internal (sine, square, triangle, ramp or arbitrary)
Rate:	0.001 Hz to 10 kHz
Span:	0.01 µHz to 31 MHz (2 MHz for triangle, ramp)

Phase Modulation:

Source:	Internal (sine, square, triangle, ramp or arbitrary)
Rate:	0.001 Hz to 10 kHz
Span:	9999.99°

Burst Modulation:

Source:	Sine, square, triangle, ramp, arbitrary
Rate:	2 MHz for sine, square, triangle, ramp, ARB
Count:	1 to 65,000 cycles/burst
Modulation Output:	0 V to 5 V

Frequency Sweep:

Type:	Linear or log, phase continuous
Waveforms:	Up, down, up-down, single sweep.
Sweep Time:	0.001 Hz to 10 kHz
Span:	0.01 µHz to 31 MHz (2 MHz for Ramp and Triangle)
Marker Output:	Two markers may be set at any sweep point (TTL Output)
Sweep Output:	0 to 10 V linear ramp signal, synchronized to sweep

Trigger Generator:

Source:	CH1: Single, INT RATE, POS EXT1, NEG EXT1, Line CH2: INT CH1, INT RATE, POS EXT2, NEG EXT2
Rate:	0.1 mS to 999.99 Seconds
External:	Positive or negative edge, TTL input
Output:	TTL level

Standard Time Base:

Accuracy:	±3 ppm [20° to 30°C, (68° to 86°F)]
Aging	±3 ppm/year
Input:	10 MHz/N ± 2 ppm where N=1 to 8, 1 V p-p min input level
Output:	10 MHz, >1 V p-p sine wave into 50 Ω

Warranty:	Two year limited warranty on parts and labor
Agency Compliance:	CE Approved

General Specifications

Interfaces:	Standard RS-232 (2400 to 19,200 baud) or GPIB option
Dimensions:	363 mm x 109 mm x 386 mm, (14.3" x 4.3" x 15.2") (W x H x D)
Weight:	9.2 lbs (8.7 kg)
Supply Voltage:	100/120/220/230 Vac (±10%), 50/60 Hz
Power consumption:	1 Channel: 46 W (Model 3101) 2 Channels: 80 W (Model 3102)
Operating Temperature:	5° to 40°C, (41° to 104°F)
Guaranteed Temperature:	10° to 35°C, (50° to 95°F)
Operating RH:	50% to 80%
Storage Temperature:	-20° to 70°C, (-4° to 158°F)
Storage RH:	< 85% Indoor Use Only
Altitude:	Up to 2,000 meters, (6,560 ft)
Pollution:	Degree 2
Accessories:	Manual, line cord, 2 spare fuses

Models 3101 & 3102 are CE Marked

Specifications subject to change without notice.

12/00.4M.3101/3102.PG

TEGAM

YOUR GLOBAL SOURCE FOR TEST AND MEASUREMENT SOLUTIONS

TEN TEGAM WAY • GENEVA, OHIO 44041
440-466-6100 • FAX 440-466-6110
www.tegam.com • e-mail: sales@tegam.com