

300MS/s Single-Channel Arbitrary Waveform Generator

MODEL 3361



- Single-channel 300MS/s waveform generators
- Synthesized function generator to 150 MHz
- 12 Bit amplitude resolution
- 4 Meg word waveform memory, 16Meg word memory, optional
- 10 Built-in popular standard waveforms
- Triggered, gated and burst modes
- Amplitude modulation

- Waveform linking, looping and sequencing with up to 4096 segments and up to 16 sequence tables for generating a sequence of sequences
- GPIB and RS-232 interfaces
- ArbConnection software for easy waveform creation & control

Model 3361 is a single-channel, high performance waveform generator that can be used as either complex arbitrary waveform generator or extremely high-speed function generator, with up to 12 bits of vertical resolution.

Arbitrary Waveform Generator

The 3361 is a single-channel Waveform Generator with 4 Meg word (optional 16 Meg word per channel) of waveform memory. Model 3361 is high performance waveform generator and can be used as either arbitrary waveform generators or high-speed function generators. It generates waveforms with 12 bits of vertical resolution. The 3361 have auxiliary outputs that provide the same waveforms as the main output with a fixed 1 volt output.

High Speed Function Generator

The 3361 generates standard functions such as sine, square and triangle waves. Sine and square waves can be generated at up to 150 MHz, making the 3361 the fastest function generators available today. The internal reference oscillator provides 1 ppm accuracy and has excellent long term stability. An external

frequency reference can be used if better accuracy or stability is required.

Amplitude Modulation

Amplitude modulation and suppressed carrier modulation is available on all waveforms, and is controlled via an external signal. 0% to 200% modulation is possible at bandwidths up to 1MHz.

Extensive Trigger Modes

In addition to continuous waveform generation, operation of the 3361 can be triggered in a number of modes. A single waveform occurrence can be initiated with the trigger function, or a specific number of waveforms (up to 1 million) produced with either internal, external or manual triggers. The gated function will allow waveform generation whenever the gating signal is true.

Waveform Sequencing

For long or very complex waveforms, waveform memory can be divided into up to 4096 smaller segments and different waveforms can be loaded into each segment. The various segments may then be loaded into a sequence

table to generate long and complex waveforms. The sequence table can link up to 4096 segments, while each segment can loop up to 1 million times. Model 3361 can store up to 16 different sequence tables, then use these for generating a sequence of sequences. This capability makes it possible to generate even the most complex signals.

ArbConnection

Unlimited Source of Arbitrary Waveforms. With the ArbConnection software you can control instruments functions, modes and features. You can also create virtually an unlimited variety of test waveforms. Freehand sketch allows you to draw your own custom waveform for quick analysis of analog signals. You can use the built-in equation editor to create your own exotic functions. Add or subtract components of a Fourier series to characterize digital or analog filters or, inject random noise into a signal to test immunity to auxiliary noise.



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Model 3361



Service and Support

Beyond providing precision Test & Measurement instruments, Tabor Electronics provides unparalleled service and support, and is continuously finding new ways to bring added value to its customers.

Our after-sales services are comprehensive. They include all types of repair and calibration, and a single point of contact that you can turn to whenever you need assistance. As part of our extensive support, we offer individualized, personal attention Help Desk, both online and offline, via e-mail, phone or fax.

Tabor Electronics maintains a complete repair and calibration lab as well as a standards laboratory in Israel and USA. Service is also available at regional authorized repair/calibration facilities.

Contact Tabor Electronics for the address of service facilities nearest you.

Applications

For expert technical assistance with your specific needs and objectives, contact your local sales representative or our in-house applications engineers.

Manuals, Drivers, and Software Support

Every instrument comes equipped with a dedicated manual, developer libraries, IVI drivers, and software. However, if your specific manual is lost or outdated, Tabor Electronics makes it possible to log-on to its Download Center and get the latest data "in a click".

Product Demonstrations

If your application requires that you evaluate an instrument before you purchase it, a hands-on demonstration can be arranged by contacting your local Tabor Electronics representative or the Sales Department at our Corporate Headquarters.

Three-year Warranty

Every Tabor Electronics instrument comes with a three-year warranty. Each one has full test results, calibration certificate, and CD containing product's manual and complete software package. Our obligation under this warranty is to repair or replace any instrument or part thereof which, within three years after shipment, proves defective upon examination. To exercise this warranty, write or call your local Tabor representative, or contact Tabor Headquarters and you will be given prompt assistance and shipping instructions.

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TABOR ELECTRONICS Ltd.

Specification

300MS/s

Single-Channel

Arbitrary

Waveform Generator

Model 3361



OUTPUT CHANNELS

No. of Channels:	1
Main:	Programmable-level output channels
Auxiliary:	Fixed-level, I and Q channels

STANDARD WAVEFORMS

Waveforms:	Sine, Triangle, Square, Pulse, Ramp, Sinc (Sine(x)/x), Gaussian Pulse, Exponential Fall, Rising Pulse, Noise, DC.
Frequency Range:	Waveform dependent

SINE

Frequency Range:	100µHz to 150MHz
Band Flatness:	5% to 10MHz; 10%, to 37.5MHz; 30%, to 150MHz

Programmable Parameters:	Start phase, 0 to 360°
Harmonics and non-related spurious at 3Vp-p:	< -50dBc for carrier frequencies 1MHz < -40dBc for carrier frequencies 37.5MHz < -35dBc for carrier frequencies 70MHz < -28dBc for carrier frequencies 150MHz
Total Harmonic Distortion:	0.5% to 100KHz

TRIANGLE

Frequency Range:	100µHz to 37.5MHz
Start phase:	0 to 360°

SQUARE

Frequency Range:	100µHz to 150MHz
Duty cycle:	1% to 99%
Rise/Fall time:	<2.5ns

PULSE

Frequency Range:	100µHz to 18.75MHz
Adjustable Parameters:	
Delay	0% to 99.9% of period

High Time	0% to 99.9% of period
Fall Time	0% to 99.9% of period
Rise/Fall time:	<2.5ns

RAMP

Frequency Range:

100µHz to 37.5MHz

Adjustable Parameters:

Delay	0% to 99.9% of period
Rise Time	0% to 99.9% of period
Fall Time	0% to 99.9% of period

SINC (SINE(X)/X)

Frequency Range:

100µHz to 9.375MHz

"0" Crossing:

4 to 100 cycles

GAUSSIAN PULSE

Frequency Range:

100µHz to 18.75MHz

Time Constant:

10 to 200

EXPONENTIAL FALL/RISING PULSE

Frequency Range:

100µHz to 37.5MHz

Time Constant:

-100 to 100

NOISE

Bandwidth:

37.5MHz

DC

Range:

-100% to 100% of amplitude

ARBITRARY WAVEFORMS

SAMPLE CLOCK RANGE

INTERNAL

Range:

100mS/s to 300MS/s

EXTERNAL

Connector:

Front panel BNC

Range:

100kHz to 300MHz

Vertical Resolution:

12bits
Waveform Memory: 4Meg points standard,
16Meg points optional
(per channel)

MEMORY SEGMENTATION

No. of Segments:

1 to 4096

Min Segment Size:

16 points

Memory Interleave:

8 (All trace lengths must be multiples of 8)

SEQUENCED ARBITRARY WAVEFORMS

Operation:

Permits division of the memory bank into smaller segments. Segments may be linked, and repeated in user-selectable fashion to generate extremely long waveforms.

ADVANCE MODES

Automatic Sequence Advance:

No triggers required to step from one segment to the next. Sequence is repeated continuously through a pre-programmed sequence table

Stepped Sequence Advance:

Current segment is sampled continuously, external trigger advances to next programmed segment. Control input is TRIG IN connector.

Single Sequence Advance:

Current segment is sampled to the end of the segment including repeats and idles there. Next trigger advances to next segment. Control input is TRIG IN connector.

ADVANCE SOURCE

INTERNAL

From 20µs to 1000s
±(1% + 1µs)

EXTERNAL

Front panel Trigger input
15MHz to DC

SOFTWARE

IEEE 488.2 command

Sequencer steps:

From 1 to 4096

Segment loops:

From 1 to 1Meg

Segment Duration:

Minimum 1µs

for more than one loop.

table to generate extremely long sequences.

No. of Sequenced Sequences:

16

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Specification

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Segment Limitation

Per Sequence:	2 sequences, 2048 segments; 4 sequences, 1024 segments; 8 sequences, 512 segments; 16 sequences, 256 segments
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ADVANCE MODES

Selectable:	GPIB or RS232 command selects an active sequence
Stepped:	Current sequence is sampled continuously, external trigger advances to next programmed sequence. Control input is TRIG IN connector.

ADVANCE SOURCE

INTERNAL

Internal programmable rate generator

Period:	From 20 μ s to 1000s
Accuracy:	$\pm(1\% + 1\mu)$

EXTERNAL

Input:	Front panel Trigger input
Frequency:	15MHz to DC

SOFTWARE

Activate Via:	IEEE 488.2 command
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COMMON CHARACTERISTICS

MAIN OUTPUT

Connector:	Front panel BNC
Stand-by:	Output Off or Normal
Impedance:	50 Ω , $\pm 1\%$
Protection:	Protected against temporary short to case ground
Glitch Energy:	100pV-s at 5Vp-p

FREQUENCY

Resolution:	7 digits limited by 1 μ s/s
Accuracy:	1ppm
Stability:	1ppm
Reference:	0.0001% (1ppm TCXO) initial tolerance over a 19°C to 29°C temperature range; 1ppm/ $^{\circ}$ C below 19°C and above 29°C; 1ppm/year aging rate

AMPLITUDE

Range:	10mV to 5Vp-p, into 50 Ω ; Double into open circuit
Resolution:	4 digits

Accuracy (1KHz):

1.000V to 5Vp-p	$\pm(1\% + 25mV)$
100mV to 999.9mVp-p	$\pm(1\% + 5 mV)$
10mV to 99.99 mVp-p	$\pm(1\% + 2 mV)$

OFFSET

Range:	0 to $\pm 2.495V$, amplitude dependent
Resolution:	5mV

Accuracy:	$\pm(2\% + 10mV)$
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FILTERS	150MHz Elliptic 70MHz Elliptic 5MHz Elliptic 2.5MHz Elliptic 800kHz Elliptic
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AUXILIARY OUTPUT

Operation:	Outputs the same waveform as the Main output.
Connector:	Front panel BNC
Impedance:	50 Ω , $\pm 1\%$
Level:	1V typical into 50 Ω
Protection:	Protected against temporary short to case ground

SYNC OUTPUT

Connector:	Front panel BNC
Impedance:	50 Ω , $\pm 1\%$
Level:	>2 V into 50 Ω , 4V nominal into 10K Ω
Protection:	Protected against temporary short to case ground
Validators:	BIT, LCOM, PULSE
Position:	Point 0 to n, Programmable
Width Control:	From 1% to 99%, programmable when placed in Pulse validator mode

INPUTS

TRIG INPUT	Front panel BNC 10K Ω , 5%
Connector:	Programmable from -10V to +10V
Impedance:	50mV 0.2Vp-p
Threshold Range:	10 Vrms, 1KHz to DC; $\pm 12V$ dc above 1KHz
Threshold Level:	20ns
Sensitivity:	Positive or negative going edge.
Max Input Voltage:	10 Vrms, 1KHz to DC; $\pm 12V$ dc above 1KHz
Min Pulse Width:	20ns
Slope:	Positive or negative going edge.

EXTERNAL SAMPLE CLOCK INPUT

Connector:	Front panel BNC
Impedance:	50 Ω , AC coupled
Range:	100KHz to 300MHz
Sensitivity:	200mV rms

AM INPUT

Modulation Input:	Front panel BNC
Impedance:	1M Ω , $\pm 5\%$
Max Input Voltage:	$\pm 12V$
Sensitivity:	0 V to -2V (2Vp-p) produce 100% modulation 0 V to -4V (4Vp-p) produce 200% modulation
Source:	External
Modulation Range:	0 to 200%
Bandwidth:	DC to 1MHz

AM MODULATION

Carrier waveform:	Sine, Triangle, Square, Pulse, Ramp, Sinc (Sine(x)/x), Gaussian Pulse, Exponential Fall, Rising Pulse, DC, Arb.
Source: Waveform modulation:	External only. Sine, Triangle, Square, Pulse, Ramp, Sinc (Sine(x)/x), Gaussian Pulse, Exponential Fall, Rising Pulse, DC, Arb.

TRIGGERING CHARACTERISTICS

TRIGGER SOURCES

EXTERNAL	
Connector:	Front panel BNC
Level:	-10V to +10V
Slope:	Positive or negative
Frequency:	DC to 15MHz
Impedance:	10k Ω , DC coupled
INTERNAL	
Period:	20 μ s to 1000s
Resolution:	3 digits
Accuracy:	$\pm(1\% + 1\mu)$

SOFTWARE	
Activate Via:	IEEE 488.2 command
SYSTEM DELAY	
Trigger to waveform output:	1 Sample Clock+150ns

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GATED MODE

External signal enables generator. First output cycle synchronous with the active slope of the triggering signal. Last cycle of output waveform always completed

BURST

Waveforms:	Sine, Triangle, Square, Pulse, Ramp, Sinc (Sine(x)/x), Gaussian Pulse, Exponential Fall, Rising Pulse, Noise, DC, Arb
Number of cycles per burst:	1 to 1000000(1Meg)
Trigger source:	External, Internal or software command

GENERAL

Power requirements:	90 to 264V, 47 to 63Hz, 150W max
Operating temperature:	0°C - 40°C
Humidity (non-condensing):	11°C to 30°C: 85 % + 5% 31°C to 40°C: 75 % + 5%
Storage temperature:	-40°C to + 70°C.
Interface:	GPIB and RS232C standard
Language:	IEEE-488.2 - SCPI – 1993.0
Dimensions:	19" x 5.25" x 16" (WxHxD)
Weight:	Approx 9 kg
Safety:	EN61010-1
EMC:	CE marked. Designed to meet VDE 0411/03.81 and UL 1244
Reliability:	MTBF per MIL-HDBK-217E, 25 C, Ground Benign
Workmanship Standards:	Conform to IPC-A-610D
Supplied Accessories:	Power Cord, CD containing Operating Manual, ArbConnection software and developer libraries.
Warranty:	3 years standard

ORDERING INFORMATION

MODEL	3361
300MS/s Single-Channel Arbitrary Waveform Generator	
OPTIONS	
16Meg	16 Meg Memory
ACCESSORIES	
Rails	Telescopic Rails for 19" cabinets

Note: Options and Accessories must be specified at the time of your purchase.