

# 50MS/s Arbitrary/Function Generator

**DISCONTINUED**



## MODEL 8023

- Three instruments in one box: Function generator, Arbitrary generator, and Sequence generator
- Nine Built-in popular standard waveforms
- Sample clock programmed to 50 MS/s
- 64K memory length can be divided and loaded with 99 different arbitrary waveforms
- Nine different sequences can link segments in user defined order and loop each segment to 32768
- Counted burst to 32768 output cycles, Gated mode, and Triggered mode.
- 12 Bit vertical resolution

- Arbitrary waveforms may be loaded from the front panel or from computers through a GPIB interface
- Extremely simple and intuitive front panel operation, using cursor buttons and a rotary dial. Single function keys and illuminated status indicators
- Standard GPIB interface, complies with IEEE-488.2 standard and SCPI syntax and rules
- Free ArbConnection for easy waveform creation & control

Model 8023 is the sequel to a long line of function generators, pulse generators, and arbitrary waveform generators which were brought to market by Tabor Electronics. This digital instrument is superior and far more versatile than their analog equivalent. As a waveform source, this model can replace analog generators in every application, no matter how complex.

### Function Generator

As a function generator, these models generate nine standard wave forms, of which, only three are commonly available in analog generators. These nine standard waveforms are generated from a built-in library, thus offering unsurpassed linearity, accuracy, and spectral purity. The front panel is intuitive and lets you generate waveforms and modify their parameters without wasting valuable time to read manuals. For system applications the instruments are fully programmable using SCPI (1993.0) commands. Model 8023 can generate sine and square waveforms from 10 $\mu$ Hz to 25MHz.

### Arbitrary Waveform Generator

Complex waveforms are used for testing purpose throughout the industry. While coordinates for such waveforms can easily be generated on paper or on computers, there is a need for digital instruments to take this data and convert it to electronic signals.

An arbitrary waveform generator is about the only tool that can take a set of X-Y coordinates and convert them to real life signals. Applications for an arbitrary waveform generator range from simple testing through physiological simulation to generating complex communication signals, material stress analysis, biochemical characterization and many more. There is no restraint to the shape of an arbitrary waveform. It is only limited by the speed and resolution of the generator itself. So, with 50MHz clock rates 64K of memory, 12 bits of vertical resolution, and the power to generate from the front panel 99 different arbitrary waveforms, it is unlikely that you'll need another generator to generate your signals.

### Sequence Generator

Memory management is a must in today's arbitrary waveform generators. While very few applications require one long memory, most of the waveforms require a limited number of horizontal points. As a sequence generator, the model 8023 Jet you divide the entire memory into 99 smaller segments, load each segment with a different waveform, then, select the order of which these segments will be linked and the number of loops that each segment will perform. Sounds complicated? not really! Imagine the following scenario. You have three waveforms loaded in segments 1, 2, and 3. Now you want to

generate one long waveform, which will include these three waveforms, however, you want segment 2 to be output first, segment 3 second, and at last segment 1. This is what a sequence generator does. Now you can multiply each segment by up to 32767 times. The order of segments, their length, and the number of times that they are repeated are entirely for you to decide. And remember, no delays between segments all the way to 50MHz clock rates.

### 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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### 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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# Specification 50MS/s Arbitrary/Function Generator

## Model 8023



### STANDARD WAVEFORMS

**Waveforms:** Sine, Triangle, Square, Pulse, Ramp, Sinc (Sine(x)/x), Gaussian Pulse, Exponential Fall, Rising Pulse, DC.

**Frequency Range:** Waveform dependent.  
**Source:** Internal synthesizer.

### SINE

**Frequency Range:** 10 $\mu$ Hz to 25MHz.  
**Distortion:** < 0.1%, below 100kHz.  
**Harmonics:** < 30dB below carrier, 100kHz to 25MHz.  
**Band Flatness:** 1%, to 1MHz; 5% to 10MHz; 15%, to 25MHz.

### ADJUSTABLE PARAMETERS

**Start Phase:** 0 to 360°.  
**Power (sine):** 1 to 9.

### TRIANGLE

**Frequency Range:** 10 $\mu$ Hz to 10MHz.

### ADJUSTABLE PARAMETERS

**Start Phase:** 0 to 360°.  
**Power (sine):** 1 to 9.

### SQUARE

**Frequency Range:** 10 $\mu$ Hz to 25MHz.  
**Adjustable Duty Cycle:** 1% to 99.9%.  
**Rise/Fall time:** < 6 ns.  
**Aberration:** < 5%.

### PULSE / RAMP

**Frequency Range:** 10 $\mu$ Hz to 1MHz.

### ADJUSTABLE PARAMETERS

Delay	0% to 99.9% of period.
Rise Time	0% to 99.9% of period.
High Time	0% to 99.9% of period (Pulse).
Fall Time	0% to 99.9% of period.

**Rise/Fall time:** < 6 ns.  
**Aberration:** < 5%.

### SINC (SINE(X)/X)

**Frequency Range:** 10 $\mu$ Hz to 1MHz.  
**Adjustable Cycles:** 4 to 999 cycles.

### GAUSSIAN PULSE

**Frequency Range:** 10 $\mu$ Hz to 1MHz.  
**Adjustable Time Constant:** 0 to 20.

### EXPONENTIAL FALL/RISING PULSE

**Frequency Range:** 10 $\mu$ Hz to 1MHz.  
**Adjustable Time Constant:** 0 to 20.

### DC

**Range:** 1% to 100% of amplitude.

### ARBITRARY WAVEFORMS

#### SAMPLING CLOCK

**Source:** Internal synthesizer, external clock, internal reference.

#### RANGE

**Internal:** 10mS/s to 50MS/s.  
**External:** DC to 50MHz.  
**Internal Reference:** 10MHz, fixed internal crystal clock frequency.

**Waveform Memory:** 64k points.

#### MEMORY SEGMENTATION

**No. of Segments:** 0 to 99.  
**Min Segment Size:** 10 point.  
**Vertical Resolution:** 12 bits.

#### SINEWAVE

**Total Harmonic Distortion:** < 0.05%, below 100kHz.

**Harmonic Signals Below the Carrier Level:** > 60dB, 100kHz to 1MHz; > 50dB, 1MHz to 3.125MHz

#### Built-In Utilities:

Permits global operations on memory segments.

**Copy:** Copies contents of active segment to another segment.  
**Clear:** Clears a selected memory segment.  
**Fill:** Fills a selected memory segment with constant data.  
**Offset:** Offsets a waveform in a selected memory segment.

### SEQUENCED WAVEFORMS

**Operation:** Permits division of the main memory into smaller segments. The segments may be linked and repeated to generate extremely long waveforms. Same as Arbitrary Mode.

**Sampling Clock Number of Sequences:** From 0 to 9.  
**Number of Steps:** From 0 to 99 steps, each sequence.

**Repeated Segments:** From 0 to 32768 loops, each segment.

**Segment Duration:** Minimum 100ns for more than one loop.

### COMMON CHARACTERISTICS

#### MAIN OUTPUT

**Connector:** Front panel BNC  
**Stand-By:** Output Normal or Minimum signal.  
**Impedance:** 50 $\Omega$ ,  $\pm$ 2%.  
**Protection:** Protected against continuous short to case ground.  
**Glitch Energy:** 1nV-s at 10Vp-p.

#### FREQUENCY

**Resolution:** 4 digits.  
**Accuracy:**  $\pm$ 0.01% of reading.  
**Stability:** 100 ppm.

#### AMPLITUDE

**Range:** 20mV to 20 Vp-p, into open circuit; 10mV to 10 Vp-p, into 50 $\Omega$ .  
**Resolution:** 3 digits.

**Accuracy (1 KHz):**  
1V to 10V  $\pm$ (2%+20mV)  
100mV to 1V  $\pm$ (3%+4mV)  
10mV to 100mV  $\pm$ (4%+2mV)

#### OFFSET

**Range:** 0 to  $\pm$ 4.50V, within  $\pm$ 5V window; 0 to  $\pm$ 450mV, within  $\pm$ 500mV window; 0 to  $\pm$ 45.0mV, within  $\pm$ 50mV window.

# Specification

## 50MS/s Arbitrary/Function Generator

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**Dependency:** Offset and Amplitude are independently adjustable within level windows  $\pm 5V$ ,  $\pm 500mV$ , and  $\pm 50mV$ .

**Resolution:** 3 digits.

**Accuracy:**  $\pm(2\% + 1\% \text{ of amplitude} + 20mV)$ , within 5V window;  
 $\pm(3\% + 1\% \text{ of amplitude} + 5mV)$ , within 500mV window;  
 $\pm(4\% + 1\% \text{ of amplitude} + 2mV)$ , within 50mV window.

### FILTERS

**Type:** 50MHz 7-pole elliptic;  
 25MHz 7-pole elliptic;  
 20MHz 7-pole Gaussian.

### SYNC OUTPUT

**Connector:** Front panel BNC.  
**Level:** TTL.

### AM MODULATION

**Carrier waveform:** Sine (10 to 9999 points).  
**Source:** Internal only.

**Waveform modulation:** Sine, Triangle, Square, Pulse, Ramp, Sinc (Sine(x)/x), Gaussian Pulse, Exponential Fall, Rising Pulse, DC, Arb.

**Depth:** 1% to 200%.

### TRIGGERING CHARACTERISTICS

#### TRIGGER SOURCE

##### EXTERNAL

**Connector:** Rear panel BNC.  
**Level:** TTL.  
**Slope:** Positive-going leading edge.

**Minimum Pulse Width:** 15ns.  
**Impedance:**  $1K\Omega$ ,  $\pm 5\%$ .

**Maximum Input Voltage:**  $\pm 10V$ .  
**Frequency:** DC to 10MHz

##### INTERNAL

**Period:** 20 $\mu$ s to 999s;

##### MANUAL

Single trigger (front panel push-button) simulates an external trigger signal.

**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, DC, Arb.

**Number of cycles per burst:** 1 to 32767.  
**Internal Period:** 20ms to 999s.  
**Trigger source:** Manual (Single), External or Internal.

### GENERAL

**Power:** 115/230Vac, 50 or 60Hz, 60VA max.

**Stored Set-ups:** Stores 10 complete front panel set-ups. Does not store arbitrary waveforms.

**Display:** 2 lines, 16 characters, backlit LCD.

**Operating Temperature:** 0 to 40°C, ambient.  
**Specified Accuracy:** + 25°C,  $\pm 5^\circ C$ .  
**Humidity:** 80% R.H.

**Storage temperature:** -40°C to + 70°C.  
**Interface:** GPIB standard.  
**Language:** Complies with SCPI rules and syntax, IEEE488.2

**Dimensions:** 3.5" x 8.3" x 15.4" (HxWxL).  
**Weight:** Approximately 12Lbs.  
**Safety:** EN61010-1  
**Reliability:** MTBF per MIL-HDBK-217E, 25°C, Ground Benign CE marked. Designed to meet VDE 0411/03.81 and UL 1244

**EMC:**

**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**                      **8023**

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### ACCESSORIES

**S-Rack mount**            19" Single Rack Mounting Kit  
**D-Rack mount**            19" Dual Rack Mounting Kit  
**Case Kit:**                    Professional Carrying Bag

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