

20 MHz Function Generator

MODEL 8020

- Six popular output wave forms; including sine, triangle, symmetrical square, positive and negative square waves, and DC
- Bright 4 digits display; visible at any lighting condition
- Parameters are set over exceptionally wide ranges
- Complete error detection for error-free operation
- High accuracy of programmed parameters
- High resolution digital settings, either from the front panel or through the GPIB interface
- Complete GPIB programmability (with option 1 installed)

Model 8020 is a high performance function generator. The instrument features six standard functions: Sine, Triangle, Square, Positive Square, Negative Square and DC waveforms. Its parameters are digitally controlled over extremely wide ranges normally not found in such instruments. The generator features a bright LED display which is clearly visible in any lighting conditions. Operating model 8020 is very easy, in-fact, first time users rarely need guidance. Using standard off-the-shelf components, sockets and plug-in board construction, model 8020 is easy to maintain. Installable GPIB interface upgrades model 8020 to full system performance.

Versatility

Using the microprocessor technology, the Tabor 8020 provides reliability and ease of operation in either manual or GPIB-IEEE 488 modes. Modification of parameters is digitally set over exceptionally wide ranges:

- Frequency - set from 2mHz to 20MHz
- Amplitude - set from 10mV to 15V
- Pulse Width - set from 25nS to 9.99s
- Ramp Width - set from 5 S to 9.99s
- Carrier Level - set from 0% to 100%
- Sweep Time - set from 10mS to 1000S

The 8020 provides a variety of signal waveforms are used as test stimuli to many different electronic

devices. Each model features as standard Sweep and VCO modes. Triggering facilities include Gated and Triggered modes and an internal trigger generator. Alternately, the 8020 may also be used as independent sweep generators with their output signal swept over an exceptionally wide range of 10 decades. Eight built-in sweep modes, and a choice of linear or logarithmic scale, covers a great deal of applications. A marker having a programmable frequency is available. Its output, when connected to an oscilloscope provides Z-axis modulation for trace intensification. The 8020 features a non-volatile memory capable of storing 30 complete front panel set-ups including the last setup before power shut down. This feature ensures exact duplication of previous set-ups no matter how complex.

Precision

The 8020 employs a built-in frequency counter. This counter is incorporated in an internal closed loop which constantly monitors the output frequency. When deviation from the programmed frequency is sensed, the counter instantly sends correcting data to the microprocessor. Utilizing this procedure enhances the basic frequency accuracy to 0.1% - an uncommon figure in such a class of instruments.

Production Environment

Rapid repeatable testing every time is assured by special features, which reduce the potential of



- Output may sweep, on a linear or on a logarithmic scale, in four directions: Up, Down, Up-Down, and Down Up. Sweep scale and sweep direction are front panel selectable
- Built-in, independently-programmed, asynchronous trigger generator
- 30 storable, non-volatile, front panel set-ups

operator's set-up error. Easy to understand panel layout and positive action buttons simplify operation even for less skilled user. Error messages in the readout warn of possible operator mistake. Any of 30 pre-programmed complete setup states, stored in a non-volatile memory can be recalled by a simple number, ensuring exact duplication of previous set-up no matter how complex. This feature saves a lot of time which is otherwise required to set up the instrument for different tests. All controls-choice of waveforms, setting of modifiers, and wave form output disconnect -are programmable through the GPIB interface. The last set-up state is automatically established on power turn-on, whether the power is off momentarily, over night or longer, ensuring exact continuation of the previous test. Storage of parameters include GPIB address is by a non-volatile memory. During system check-out the unit provides an error status report which may be recalled using the serial polling sequence.



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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 20 MHz Function Generator

Model 8020



WAVEFORMS

Sine, Triangle, Square, Positive Square, Negative Square, TTL Pulse (SYNC output), DC.

FREQUENCY CHARACTERISTICS

Range: 2mHz to 20MHz.
Resolution: 3 1/2 digits (2000 counts max).

ACCURACY

Continuous: $\pm 3\%$ of full scale, from 2mHz to 9.99Hz; $\pm 0.1\%$ of full scale, from 10Hz to 20MHz.
VCO and Gated: $\pm 3\%$ of reading, to 1.99MHz; $\pm 5\%$ of reading, to 20MHz.
Jitter: $<0.1\% \pm 50\text{ps}$.

WAVEFORM CHARACTERISTICS

Sine Wave Total harmonic distortion: <1%, from 2mHz to 19.9Hz; <0.5%, from 20Hz to 100kHz; <1%, from 100kHz to 1MHz.
Harmonic signals: 25dB below carrier, above 1MHz.
Sine Flatness: <0.5dB, to 1MHz; <1.5dB to 20MHz.
Triangle Linearity: Better than 99%, up to 100kHz.

SQUARE WAVE

Transition Time: < 12ns.
Aberration: < 5%.

TTL PULSE

Rise/Fall time: < 25ns.

OUTPUT CHARACTERISTICS

Stand-By Mode: Output Normal or Disabled, selectable.
Impedance: 50Ω , $\pm 2\%$.
Output Level: 20.0mV to 30.0Vp-p, into open circuit; 10.0mV to 15.0Vp-p, into 50Ω .
Resolution: 2 1/2 digits (150 counts).
Accuracy (1KHz): $\pm 2\%$ of reading, from 1.0V to 15.0V; $\pm 4\%$ of reading, from 10mV to 1.50V.

Output Protection: Protected against continuous short to case ground.

Offset Range: Offset and amplitude are independently selectable within a ± 7.5 window.

Offset Resolution: 3 digits.

DC CHARACTERISTICS

Range: Variable from -15V to + 15V, into open circuit; -7.5V to +7.5V, into 50Ω .
Resolution: 3 digits (750 counts max).
Accuracy: $\pm (1\% \text{ of reading} + 20\text{mV})$, to 7.50V; $\pm (2\% \text{ of reading} + 2\text{mV})$, to 750mV.

TRIGGERING CHARACTERISTICS

Source: Manual (front panel push-button), external TRIG IN or internal trigger generator.

MODES

External Trigger: Each input cycle generates a single output cycle.
Internal Trigger: An internal timer repeatedly generates a single output cycle.
Gated: External signal enables generator. First output cycle synchronous with trigger edge. Last cycle of output wave form always fully completed.
External Trigger: TTL, positive going edge, 20MHz max.
Internal Trigger Period: Continuously adjustable from 10s to 1000s.

LOGARITHMIC SWEEP CHARACTERISTICS

Modes: Auto, Manual, Triggered or Gated sweep. Main frequency, when triggered, repeatedly changes from start frequency setting to stop frequency setting. Available sweep directions are: up, down, up-down and down-up.

Width:

10 decades maximum.
Rate per Decade: continuously adjustable from 10ms to 1000s, NOMINAL, per-decade.

Steps per decade: Depends on sweep time and range. Automatically adjusted for maximum steps per sweep time.
Maximum steps are 200; Minimum steps are 50.

Sweep Output: 2V/decade, for < 5 decades; 1V/decade, for > 5 decades.

Marker Output: 0V with no marker; drops to -5V, NOMINAL, when marker frequency is reached.

Sweep Stop Resolution:

Same as frequency resolution.

LINEAR SWEEP CHARACTERISTICS

Modes: Same as in logarithmic sweep.
Sweep Width: 3 decades maximum.
Sweep Time: continuously adjustable from 10ms to 1000s, NOMINAL.
Sweep Out: 0 to 10V, $\pm 5\%$.
Sweep Steps: Depends on sweep time and range. Automatically adjusted by the instrument to get the maximum steps per sweep time.
Maximum steps are 1000; Minimum steps are 16.

Marker Output: Same as in logarithmic sweep
Sweep Stop Resolution: Same as frequency resolution

VCO (FM) CHARACTERISTICS

Input Impedance: $10\text{K}\Omega$, $\pm 5\%$.
Sensitivity: 0V to -10V, $\pm 20\%$ produces frequency change 1/1000 from main frequency, when main frequency is set to 1999 counts.
Band Width: DC to 70kHz.
FM Sensitivity: 0V to $\pm 100\text{mV}$, modulates to 1% deviation from center frequency.

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OPTION 1 - GPIB INTERFACE

Programmability:	All front panel controls.
Subsets:	SH1, AH1, T6, TE0, L4, LEO, SR1, RL1, PP2, DC1, DT1, C0.
Data Output Format:	Fixed output format consisting of 15 or 17 ASCII characters plus terminators.
Data Input Format:	ASCII characters lower or upper case. ASCII characters smaller than 20 HEX (32) are ignored except CR (0D HEX).
Service Request:	Selectable for illegal commands, illegal parameters and errors.
String Termination:	Selectable CR, LF, EOI or combination of all.
Address Selection:	Front panel programming.

GENERAL

Display:	4 digits, 7 segment LED's 0.5" high.
Power:	115/230Vac, 50 or 60Hz, 50VA max.
Stored Set-ups:	30 complete sets of front panel set-ups. Storage guaranteed for 3 years.
Operating Temperature:	0 to 40°C, ambient.
Specified Accuracy:	+ 25°C, ±5°C.
Storage Temperature:	-40°C to + 70°C.
Dimensions:	3.5" x 8.3" x 15.4" (HxWxL).
Rack Mount Dimensions:	3.5" x 19" (HxW).
Weight:	Approximately 12Lbs.
EMC:	CE marked
Reliability:	MTBF per MIL-HDBK-217E, 25°C, Ground Benign
Safety:	Designed to meet IEC 1010-1, UL 3111-1, CSA 22.2 #1010
Workmanship Standards:	Conform to IPC-A-610D
Supplied Accessories:	Power Cord, CD containing Operating Manual and developer libraries.
Warranty:	3 years standard.

ORDERING INFORMATION

MODEL	8020
20MHz Function Generator	
OPTIONS	
Option1	GPIB Interface
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.