



### Features:

- SYNTHESIZED SIGNAL GENERATOR

- Range 50 MHz to 18 GHz
- Calibrated Step Attenuator
- Low Spurious and Phase Noise
- $\pm 1$  dB Leveling
- High Resolution
- Pulse Modulation
- Amplitude Modulation
- Digital Sweeping
- MATE [CIIL] Interface [Optional]

- FREQUENCY MEASUREMENT

- Automatic or Manual Operation
- Frequency or Offset Measurement
- High Sensitivity
- CW or Pulse Measurement

- POWER METER

- Displays Output Level
- Measures External Level
- Measures Input/Output Difference

Microprocessor  
Controlled

IEEE-488  
Interfaced

### Description:

The Giga-tronics Model 1018 provides several microwave generation and measurement functions which result in making the instrument a versatile microwave test set that can replace a number of instruments in many applications.

The unit is basically a 50 MHz to 18 GHz digital synthesized signal generator that provides a precise, highly stable and calibrated signal output. Its frequency accuracy and stability are determined by a low noise reference oscillator. The synthesized output has versatile pulse modulation, amplitude modulation and digital sweep with selectable limits in precise increments of 1 MHz, 10 MHz or 100 MHz. A sweep output is provided to drive XY plotters, oscilloscopes or other external indicating devices.

The instrument has the automatic capability to generate precise microwave frequencies which allow it to operate in a heterodyne mode to measure and directly read out unknown frequencies. The measured frequency can be CW or pulse modulated. By setting the synthesizer output to a precise frequency the instrument can measure frequency offset.

## Description:

The Model 1018 has a built-in power meter which can be used in three measurement modes. It can monitor the output of the signal generator or it can measure external signals. Also, the power meter can measure directly the difference in the power levels between the output of the generator and the

output power level of a device under test.

All function controls and frequency/power readouts are IEEE-488 interfaced. This provides complete automatic operation of the test set.

## Model 1018 Specifications

### FREQUENCY SYNTHESIZER

#### Frequency Characteristics

Range: 50 MHz to 18 GHz  
Resolution: 1 MHz (1 kHz with Option 03)  
Accuracy: Same as Time Base  
Time Base (Internal): 10 MHz,  $<1 \times 10^{-6}$ /year rate  
( $<1 \times 10^{-9}$ /day with Option 06)  
Time Base (External): 10 MHz  $\pm 1 \times 10^{-6}$  or better;  
0.5 to 5 V, p-p, overrides internal time base  
Time Base Output: Buffered 10 MHz, 1 V RMS into  
50 ohms, derived from internal or external time base

#### Spectral Purity

Harmonics, Subharmonics:  $<-55$  dBc  
Spurious (Nonharmonics):  $<-55$  dBc

#### RF Output Characteristics

Output Level (25°C  $\pm$  10°C): +3 to -99 dBm, leveled  
Accuracy (25°C  $\pm$  10°C):  $\pm 1$  dB  
Attenuation: 99 dB in 1 dB steps; settable to 119 dB  
in 0.1 dB steps under remote control  
Level Adjustment: -5 dB to +15 dB  
Source Impedance: 50 ohms, nominal

#### Sweep Operation

Method: Digitally controlled continuous or step  
and lock  
Mode: Automatic recycle, single sweep or single step  
Range: Selectable over entire frequency range of the  
instrument  
Increments: Selectable 1, 10 or 100 MHz  
Sweep Time: Variable from 10 msec to 100 sec  
Sweep Rate: Typically 50 MHz/msec, max  
Sweep Trigger Input: TTL low to initiate single sweep  
or single step  
Ramp Output: 0 to +10 V, proportional to frequency  
between any preset limits, any sweep mode  
Pen Lift Output: TTL low during retrace

#### Pulse/Square Wave Modulation

Repetition Rate: Variable, 100 Hz to 50 kHz with  
calibrated 1 kHz point  
Pulse Width: Variable, 0.1 to 10  $\mu$ sec with  
calibrated 1  $\mu$ sec point  
On/Off Ratio:  $>60$  dB  
Rise/Fall Times:  $<25$  nsec  
Overshoot, Undershoot and Ringing:  $\pm 2$  dB, max  
Settling Time:  $\pm 1$  dB within 100 nsec  
Sync Output: TTL level modulation waveform  
External: TTL level signal, 10 Hz to 1 MHz,  
0.1  $\mu$ sec min width, rising or falling edge triggering

#### Amplitude Modulation [External]

Frequency Response: 10 Hz to 5 kHz at 3 dB points  
referenced to 1 kHz  
Modulation Depth: 0 to 20 dB  
Input Required: 1 V, p-p, for 50% modulation  
at 1 kHz  
Input Impedance: 500 ohms, AC coupled  
Waveform: Any

### FREQUENCY COUNTER

#### Measurement Characteristics

Mode: CW or Pulsed RF  
Range: 100 MHz to 18 GHz  
Sensitivity: typically -30 dBm  
Impedance: 50 ohms, nominal  
Resolution: Direct, 100 Hz; Offset, 10 Hz  
Time Base: Same as Frequency Synthesizer  
Offset Range:  $\pm 500$  MHz  
Minimum Pulse Width (Pulsed RF Measurement): 0.5  $\mu$ sec

### POWER METER

#### Measurement Characteristics

Frequency: 50 MHz to 18 GHz  
Range (External): -30 to +10 dBm  
Accuracy (25°C  $\pm$  10°C):  
(Internal)  $\pm 1$  dB  
(External)  $\pm 1$  dB (-10 to +10 dBm),  
 $\pm 2$  dB (-30 to -10 dBm)  
Resolution: 0.1 dB  
Power Meter Output: 0.5 V/dBm, nominal (+10 V at  
+10 dBm and -10 V at -30 dBm into 2 kohms, min)

### GENERAL SPECIFICATIONS

Display: Frequency 9 digits; Power, 3 digits  
Remote Interface: IEEE STD 488-1978 (RS-232 by  
Option 04) - All front panel controls and readouts  
except variable modulation rate and width  
Operating Temperature Range: 0 to 50°C  
Warm-up Time (to meet all specifications): 20 minutes, max  
Environmental: Complies with MIL-T-28800B, Type III,  
Class 5, Style E  
Power: 100/120/220/240 VAC  $\pm 10\%$ , 50 - 400 Hz, 250 W  
Dimensions (Net): 16.75" W x 24" D x 5.25" H;  
Weight: 65 lbs (nominal) (42,5 x 60,9 x 13,3 cm; 29,6 kg)  
(Packed for Air Shipment): 24" W x 31" D x 11.25" H;  
Weight: 80 lbs (nominal) (60,9 x 78,7 x 28,6 cm; 36,3 kg)  
Accessories Included: 1 ea Operation & Maintenance Manual  
1 ea 6 ft Power Cord 1 ea PC Board Extractor  
3 ea PC Extender Boards

## Model 1018 Options

02: No Low Band, 50 MHz to 2 GHz  
03: 1 kHz Resolution  
04: RS-232 Interface in lieu of IEEE-488

06: High Stability Time Base,  $1 \times 10^{-9}$ /day  
07: Scan Modulation in lieu of External AM  
12: Operation to 12 GHz only, No 12-18 GHz band  
13: MATE (CIIL) Interface - All Signal Generator Parameters



2495 Estand Way / Pleasant Hill, California 94523 / Phone: (415) 680-8160

Printed in USA - 4/84