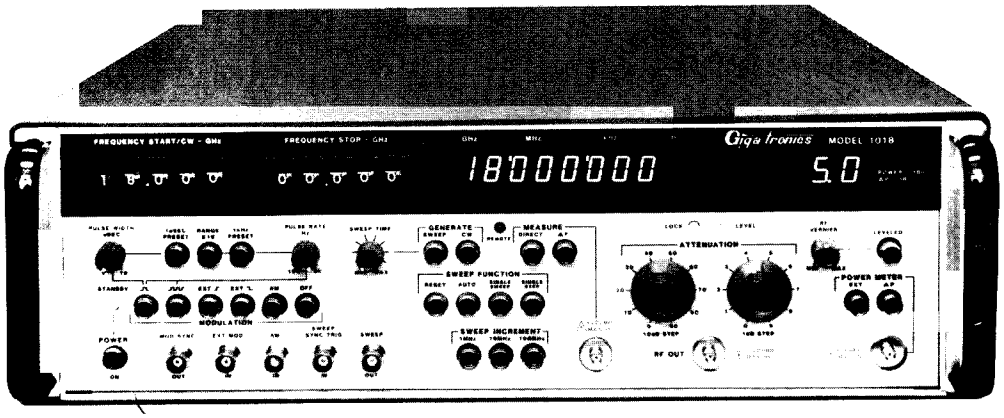
DATA SHEET

Giga-tronics
INCORPORATED
Microwave Instrumentation

18 GHz Microwave Synthesized Signal Generator/Counter Model 1018



Features:

- **SYNTHESIZED SIGNAL GENERATOR**
  - Range 50 MHz to 18 GHz
  - Calibrated Step Attenuator
  - Low Spurious and Phase Noise
  - ±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.

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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 ± 1×10^{-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 ± 10°C): +3 to -99 dBm, leveled
Accuracy (25°C ± 10°C): ± 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 µsec with calibrated 1 µsec point
On/Off Ratio: >60 dB
Rise/Fall Times: <25 nsec
Overshoot, Undershoot and Ringing: ± 2 dB, max
Settling Time: ± 1 dB within 100 nsec
Sync Output: TTL level modulation waveform
External: TTL level signal, 10 Hz to 1 MHz, 0.1 µsec 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: ± 500 MHz
Minimum Pulse Width (Pulsed RF Measurement): 0.5 µsec

POWER METER

Measurement Characteristics

Frequency: 50 MHz to 18 GHz
Range (External): -30 to +10 dBm
Accuracy (25°C ± 10°C):
(Internal) ± 1 dB
(External) ± 1 dB (-10 to +10 dBm), ± 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 ± 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, 1×10^{-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

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