

**Instruction Manual
for
MODEL 1804D

1000 MHz
FREQUENCY
COUNTER**

BK PRECISION[®]

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TABLE OF CONTENTS

	page		page
TEST INSTRUMENT SAFETY.....	inside front cover	Instrument Repair Service	10
SPECIFICATIONS.....	3	WARRANTY SERVICE INSTRUCTIONS.....	11
CONTROLS AND INDICATORS	6	LIMITED ONE-YEAR WARRANTY	13
OPERATING INSTRUCTIONS.....	8		

SPECIFICATIONS

MODES/FEATURES

Gate Times 1.0 sec and 0.1 sec gates.
Displayz 7 digits

FREQUENCY CHARACTERISTICS

Range 10Hz to 1000MHz
Accuracy:
 1.0 Sec Gate \pm Time base accuracy, \pm 1 count
 0.1 Sec Gate \pm Time base accuracy, \pm 2 counts
Resolution:
 1.0 Sec Gate 1Hz
 0.1 Sec Gate 10Hz

INPUT CHARACTERISTICS

IMPEDANCE HF 1 M Ω VHF 50 Ω
Connector BNC
Coupling D6
Sinewave Sensitivity 50mVrms, 10Hz to 200MHz
Maximum Input 3V

TIME BASE CHARACTERISTICS

Type Crystal Oscillator
Frequency 5.24288MHz
Stability \pm 0.1ppm
Temperature Stability \leq 0.001%(10ppm), 0-50 $^{\circ}$ C
Maximum Aging Rate \pm 10ppm/year

Description:

The 1804D is a solid state eight digital frequency counter for frequencies between 10Hz to 1.0GHz. A gate change over circuit and VHF divider provides the ability to measure frequencies with a accuracy of one digit.

Measurement:

First connect an input cable to either the VHF or HF inputs of the frequency counter, and then switch the 1804D on. Switch the range switch to either HF or VHF, depending on what input range you are planning to measure. Using the switch gate time you can switch the gate time from either 0.1 sec. (X1) to 1 sec. (X10). In the VHF range the last two digits are not on displayed

Please make sure that the voltage of the test signal is in the given range (see specification). If the voltage is too high or too low you have to use either a potential divider or a pre-amplifier.

Specifications:

Frequency Range:

HF:	10Hz to 10MHz
VHF:	10MHz to 200MHz

Accuracy:

1.0 sec. gate:	\pm Time base accuracy +1 count
0.1 sec. gate:	\pm Time base accuracy +1 count

Input connectors:

BNC

Input Impedance:
 HF: 1M Ω
 VHF: 50 Ω
 Input Voltage: 50mV Nominal, 3V Maximum
 Gate Times: 0.1 sec. 1 sec.
 Definition: HF 1Hz/VHF 10Hz
 Operating Temperature: 0 to 40C $^{\circ}$
 Power Supply: 7-10V, **800mA**
 Input Sensitivity: 50mV (10Hz to 200MHz)

DISPLAY CHARACTERISTICS

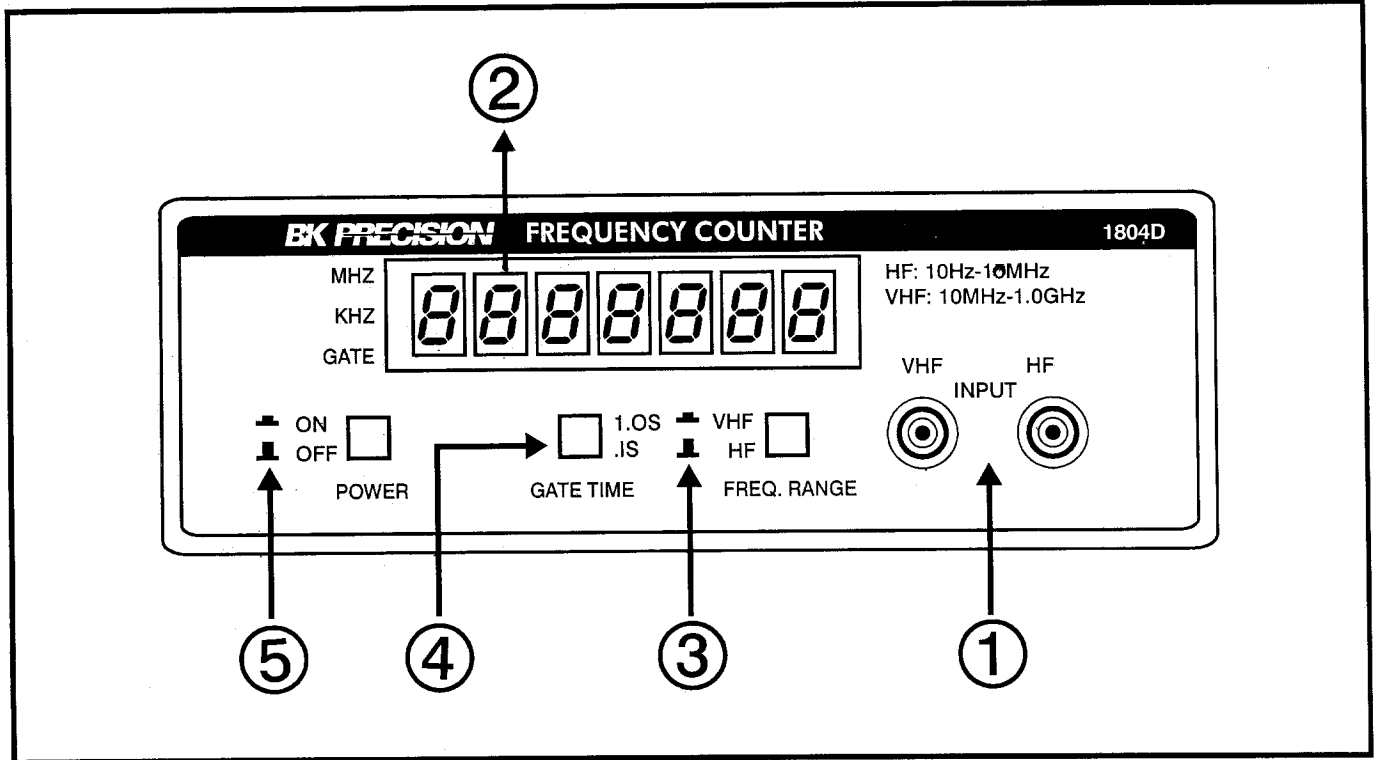
Display 0.43"LEDs
 Overflow Indicator OVERflow indicator(top left corner of display)
 lights when count exceeds 199.9999 counts.
 Display Update Time 1.0 Sec Gate:2.0 seconds.
 0.1 Sec Gate:0.2 seconds.

GENERAL

Power:
 AC Adaptor 7-10V with 800mA
 Temperature Range & Humidity:
 Operation 0 to + 50 $^{\circ}$ C, \leq 85%R.H.
 Storage -15 $^{\circ}$ C to + 70 $^{\circ}$ C, \leq 75%R.H.
 Dimensions(HxWxD) 2.1" \times 9.06" \times 6.18"(54 \times 230 \times 157mm)
 Weight 0.8Kgs(1.761 lbs)
 Accessories Supplied Instruction Manual
 BNC to Clip cable

CONTROLS AND INDICATORS

- 1.Input Jack.** Input jack for 10Hz to 1000MHz frequency measurements.
- 2.Display.** Seven digit display used for all frequency readings.
- 3.Frequency Function Switch.:** Selects VHF and HF frequency range at input jack.
- 4.Gate Time Switch.:** Selects gate time 0.1 second and 1.0 second.
- 5.POWER Switch:** Turns power ON and OFF. .



OPERATING INSTRUCTIONS

WARNING

Some operating conditions may pose an electrical shock hazard. Know and observe the precautions described in the "Test Instrument Safety" section.

1. Connect the AC Adapter to an ac outlet and plug into the rear panel jack of the frequency counter.
2. Set the POWER/GATE TIME switch to 0.1S or 1.0 S.
 - a: Use 0.1S for faster measurement of high frequency signals. The update time of the display is every 0.2 second. Resolution is 10Hz.
 - b: Use 1.0S for measurement of low frequencies or where highest resolution is needed. The update time of the display is every 2 seconds. Resolution is 1Hz.
3. Apply the 10Hz to 1000MHz signals to be measured to the input jack.

CAUTION

To prevent damage to the unit, do not apply input voltage higher than the limits listed in the "Specifications" section.

Connect the instrument ground lead only to zero volt points in the circuit under test. Attempting to "float" the unit may result in a shock hazard, since the instrument ground is exposed at the front panel BNC connector.

If measuring ac line frequency, observe the precautions listed in the "Line Voltage Measurement" paragraph.

4. Frequency is given by the front panel display. The decimal point is automatically positioned.
 - a. With a 1.0S gate time, readings below 1MHz are given in decimal MHz, above 1MHz, they are in whole megahertz. For example, 12KHz is displayed as 0.012000, and 12MHz is 12.000000.
 - b. With a 0.1S gate time, all readings are displayed in MHz, and with one less digit resolution. For example, 12KHz is displayed as 0.01200, and 12MHz is 12.000000.
5. Measurement interval, or "gate time", is 1.0 second or 0.1 second. This is combined with an additional interval of equal time for internal latching and resetting, for a total of 2 seconds between display updates when 1.0S gate time is selected or 0.2 seconds when 0.1S gate time is selected.

CONSIDERATIONS

Display Instability

An uncertainty of ± 1 least significant digit is inherent in all digital measurements, and greater uncertainties can result from other factors. For example, in low frequency measurements, high frequency noise on the input can cause miscounting. Also, uncertainty may be introduced by instability of the input frequency, usually common with LC-type oscillators.

Use of Antenna

To measure transmitter frequency, it is not always necessary to have a direct electrical connection to the transmitter. In fact, the counter should be protected against excessive power levels. A preferred method of frequency measurement is to connect an antenna to the input of the counter. The BK Precision Model PT-21 Antenna Kit is ideal for use with the Model 1803d counter for measuring frequencies from 20MHz to 200MHz. The antenna should be placed parallel with the transmitting antenna and separate by a few inches. The specific distance is determined by the power level of the transmitter. Some

very low power transmitters may not provide enough signal to the counter with this method. An unmodulated carrier should be transmitted and the frequency will appear on the display of the counter.

Cable Considerations

Cable connections in RF measurements should be aimed at reducing standing waves and shunt cable capacitance, both of which can affect measurement accuracy.

Standing waves can be minimized by matching impedances of signal source, cable, and termination. For example, for a 50 ohm source, use a 50 ohm cable and terminate with a 50 ohm resistive load. Both standing waves and shunt cable capacitance can be reduced by keeping cable lengths short, under three feet (91cm).

Service Information

Warranty Service: Please return the product in the original packaging of purchase to the below address. Clearly state in writing the performance problem and return any leads, connectors and accessories that you are using with the device.

Non -Warranty Service: Return the product in the original packaging to the below address. Clearly state in writing the performance problem and return any leads, connectors and accessories that you are using with the device. Customers not on open account must include payment in the form of a money order or credit card. For the most current repair charges contact the factory before shipping the product.

Return all merchandise to B&K Precision Corp. with pre-paid shipping. The flat-rate repair charge includes return shipping to locations in North America. For overnight shipments and non-North America shipping fees contact B &K Precision Corp.

B&K Precision Corp.
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Placentia, CA 92870

Phone: 714-237-9220

Facsimile: 714-237-9214

E-mail: service@bkprecision.com

Website: www.bkprecision.com

Include with the instrument your complete return shipping address, contact name, phone number and description of problem.

WARRANTY SERVICE INSTRUCTIONS (For U.S.A. and its Overseas Territories)

1. Refer to the MAINTENANCE section of your **B+K Precision** instruction manual for adjustments that may be applicable.
2. If the above-mentioned does not correct the problem you are experiencing with your unit, pack it securely (preferably in the original carton or double-packed).
3. Enclose a letter describing the problem and include your name and address.
4. Enclose proof of purchase date; that is, a dated copy of the sales receipt.
5. Deliver to, or ship **PREPAID** (UPS preferred in U.S.A.) to the nearest **B+K Precision** authorized service agency (see list enclosed with unit).

If your list of authorized **B+K Precision** service agencies has been misplaced, contact your distributor for the name of your nearest service agency, or write to:

B+K Precision
Factory Service Operations
1031 Segovia Circle
Placentia, CA 92870
Tel (714) 237-9220

Also use this address for technical inquiries and replacement parts orders.

Limited one-year Warranty

B & K Precision warrants to the original purchaser that its product, and the component parts thereof, will be free from defects in workmanship and materials for a period of two years from the date of purchase.

B & K Precision will, without charge, repair or replace, at its option, defective product or component parts upon delivery to an authorized **B & K Precision** service contractor or the factory service department, accompanied by proof of the purchase date in the form of a sales receipt.

To obtain warranty coverage in the U.S.A., this product must be registered by completing and mailing the enclosed warranty registration card to **B & K Precision**, 1031 Segovia Circle, Placentia, CA 992870 - 7137 within fifteen (15) days from the date of purchase.

Exclusions: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. It is void if the serial number is altered, defaced or removed.

B & K Precision shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may also have other rights which vary from state to state.

MODEL 1803D

DATE PURCHASED _____