INSTRUCTION MANUAL

BK PRECISION®

Model 1803D

200 MHz FREQUENCY COUNTER

TEST INSTRUMENT SAFETY

WARNING

Normal use of test equipment exposes you to a certain amount of danger from electrical shock because testing must sometimes be performed where exposed high voltage is present. An electrical shock causing 10 milliamps of current to pass through the heart will stop most human heartbeats. Voltage as low as 35 volts dc or ac rms should be considered dangerous and hazardous since it can produce a lethal current under certain conditions. Higher voltages are even more dangerous. Your normal work habits should include all accepted practices to prevent contact with exposed high voltage, and to steer current away from your heart in case of accidental contact with a high voltage. Observe the following safety precautions:

1. There is little danger of electrical shock from the dc output of this power supply because it can source 60 Vdc. There are several other possible test conditions using this power supply that can create a high voltage shock hazard:

   a. If the equipment under test is the "hot chassis" type, a serious shock hazard exists unless the equipment is unplugged (just turning off the equipment does not remove the hazard), or an isolation transformer is used.
   b. If the equipment under test is "powered up" (and that equipment uses high voltage in any of its circuits), the power supply outputs may be floated to the potential at the point of connection. Remember that high voltage may appear at unexpected points in defective equipment. Do not float the power supply output to more than 100 volts peak with respect to chassis or earth ground.
   c. If the equipment under test is "off" (and that equipment uses high voltage in any of its circuits under normal operation), discharge high-voltage capacitors before making connections or tests. Some circuits retain high voltage long after the equipment is turned off.
2. Use only a polarized 3-wire ac outlet. This assures that the power supply chassis, case, and ground terminal are connected to a good earth ground and reduces danger from electrical shock.
3. Don't expose high voltage needlessly. Remove housings and covers only when necessary. Turn off equipment while making test connections in high-voltage circuits. Discharge high-voltage capacitors after removing power.

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SPECIFICATIONS

MODES/FEATURES

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

FREQUENCY CHARACTERISTICS

Range:	HF 10Hz to 25MHz VHF 10MHz TO 200MHz
Accuracy:	
1.0 Sec Gate	± Time base accuracy, ± 1 count
0.1 Sec Gate	± Time base accuracy, ± 2 counts
Resolution:	
1.0 Sec Gate	1Hz
0.1 Sec Gate	10Hz

INPUT CHARACTERISTICS

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

TIME BASE CHARACTERISTICS

Type	Crystal Oscillator
Frequency	5.24288MHz
Stability	±10ppm
Temperature Stability	<0.001%(10ppm),0-500 C
Maximum Aging Rate	±l0ppm/year

SPECIFICATIONS

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

AC Input:

AC Adaptor ---------- 7-10V with 500mA

Temperature Range & Humidity:

Operation ---------- -. 0 to +50°C, 85%R.H.

Storage ---------- -- -15°C to + 70°C, <-75%R.H.

Dimensions (HxWxD) ---------- -- 2.1" X 9.06" X 6.18"(54 X 230 X 157mm)

Weight ---------- -- 0.8Kgs (1.761 (lbs)

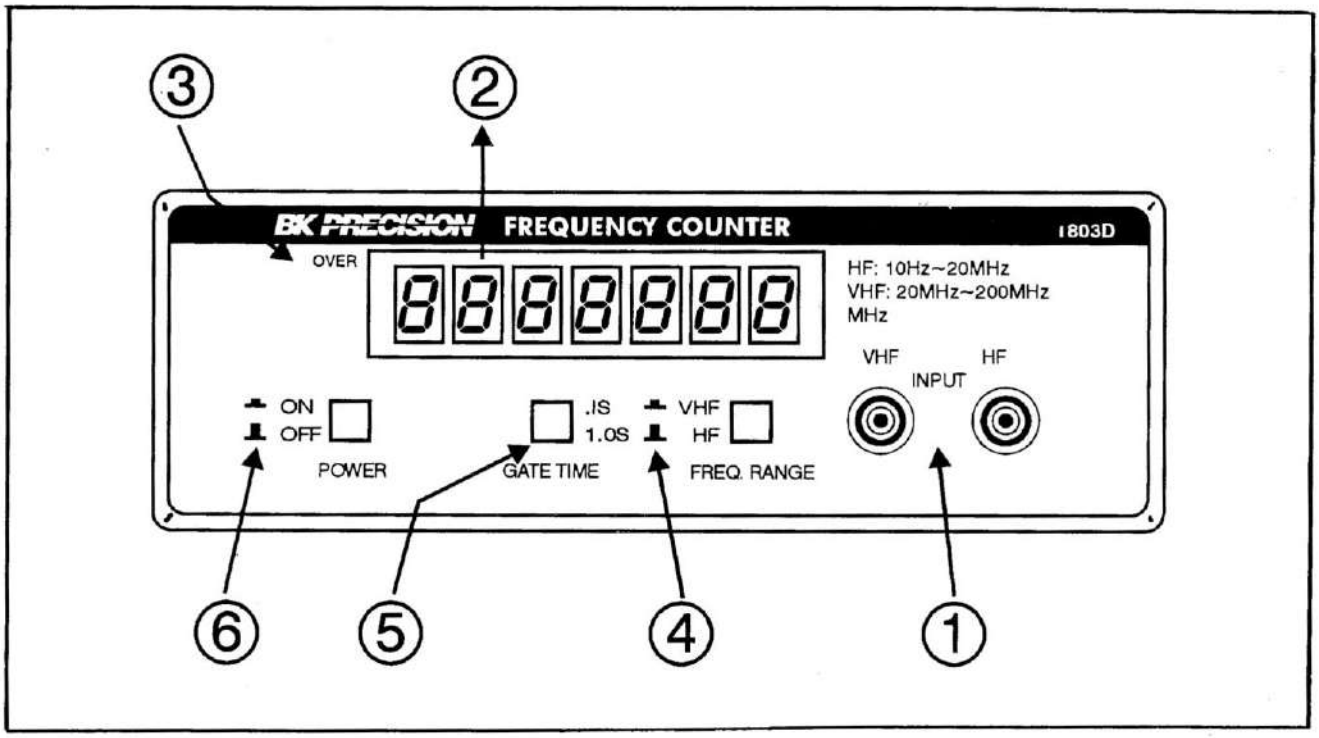
Accessories Supplied ---------- -- Instruction Manual BNC to Clip cable

NOTE: Specifications and information are subject to change without notice. Please visit _____ for the most current product information. This instrument must be powered via the included 110 V AC power adapter. There is no option for a 220 V AC adapter.

CONTROLS & INDICATORS

1. **Input Jack.** Input jack for 10Hz to 200MHz frequency measurements.
2. **Display.** Seven digit display used for all frequency readings.
3. **OVERfIow Indicator.** Lights whenever range of display is exceeded (199.99999MHz). Most significant digit is not displayed.
4. **Frequency Function** Switch.: Selects VHF and HF frequency range at input jack.
5. **Gate Time Switch**.: Selects gate time 0.1 second and 1.0 second.
6. **POWER Switch**: Turns power ON and OFF.

CONTROLS AND INDICATORS



OPERATING INSTRUCTIONS

WARNING

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

2. Connect the AC Adapter to an ac outlet and plug into the rear panel jack of the frequency counter.

3. Set the POWER/GATE TIME switch to 0.IS 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 I.OS for measurement of low frequencies or where highest resolution is needed. The update time of the display is every 2 seconds. Resolution is 1Hz.

4. Apply the 10Hz to 200MHz signals to be measured to the input jack.

CAUTION

To prevent damage to the unit, do not apply input voltage higher that 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.

1. .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 MHz, they are in whole megahertz. For example, 12KHz is displayed as.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 12MHzis 12.000000.

5. Measurement interval, or "gate time", is 1.0 second or 0. I second. This is combined with an additional interval of equal time for internal latching and resetting, for a total of 2 seconds between display updated when 1.0S gate time is selected or 0.2 seconds when 0.1S gate time is selected.

6. The OVER flow indicator lights whenever the range of the display (199.9999MHz) is exceeded.

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 adirect electrical connection to the transmitter. In fact, the counter should be protected against from excessive power levels. A preferred method of frequency measurement is to connect an antenna to the input of the counter .The BK Precision Model AT-21 Antenna Kit is ideal for use with the Mode1 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 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, less than three feet (91cm).

Service Information

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

Non-Warranty Service: Return the product in the original packaging to the address below. Clearly state in writing the performance problem and return any leads, probes, 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 please visit

Return all merchandise to B&K Precision Corp. with pre-paid shipping. The flat-rate repair charge for Non-Warranty Service does not include return shipping. Return shipping to locations in North American is included for Warranty Service. For overnight shipments and non-North American shipping fees please contact

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

Limited One-Year Warranty

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

B&K Precision Corp. will, without charge, repair or replace, at its option, defective product or component parts. Returned product must be 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 a warranty registration form on
within fifteen (15) days 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. The warranty is void if the serial number is altered, defaced or removed.

B&K Precision Corp. shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations 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 have other rights, which vary from state-to-state.

TEST INSTRUMENT SAFETY

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4. If possible, familiarize yourself with the equipment being tested and the location of its high voltage points. However, remember that high voltage may appear at unexpected points in defective equipment.
5. Use an insulated floor material or a large, insulated floor mat to stand on, and an insulated work surface on which to place equipment; and make certain such surfaces are not damp or wet.
6. When testing ac powered equipment, the ac line voltage is usually present on some power input circuits such as the on-off switch, fuses, power transformer, etc. "any time" the equipment is connected to an ac outlet.
7. **B+K Precision** products are not authorized for use in any application involving direct contact between our product and the human body, or for use as a critical component in a life support device or system. Here, "direct contact" refers to any connection from or to our equipment via any cabling or switching means. A "critical component" is any component of a life support device or system whose failure to perform can be reasonably expected to cause failure of that device or system, or to affect its safety or effectiveness.
8. Never work alone. Someone should be nearby to render aid if necessary. Training in CPR (cardio-pulmonary resuscitation) first aid is highly recommended.