

## Section 1

# Introduction & Specifications

## 1-1. INTRODUCTION

1-2. The Fluke Model 1900A is a 5 Hz to 80 MHz multiple-function counter capable of making frequency, period, period averaging and totalize measurements. In the frequency mode, resolution is manually selectable at 0.1 Hz, 1.0 Hz, 10 Hz and 100 Hz. In the period averaging mode, the number of periods averaged is manually-selectable at  $10^0$ ,  $10^1$ ,  $10^2$  and  $10^3$  periods. Automatic selection of resolution and number of periods averaged (autoranging) is also provided to automatically select the optimum range for a particular input signal. However, the 100 Hz resolution and  $10^3$  periods must be manually selected.

1-3. The measurement display is six digits, light-emitting-diode-type (LED) with leading-zero suppression and automatic decimal point positioning. Annunciators are provided to indicate measurement units (kHz, MHz, milliseconds and microseconds) and also overflow when the capacity of the display is exceeded. All displayed information

is also available, in parallel BCD format, at a rear-panel connector when the unit is equipped with an optional Data Output Unit (DOU).

1-4. The Model 1900A is equipped with a selectable 1 MHz low-pass filter for use in electrically noisy environments, and a selectable 10:1 attenuator for use with high-level inputs. A self-check mode of operation is provided to verify overall performance of the unit. Power requirements are 100, 115 or 230 volts at 50 to 400 Hz for the line-powered version. An optional battery-powered version, Model 1900A-01, provides for use away from ac power lines and is equipped with rechargeable nickel-cadmium batteries. The battery-powered version also operates from the ac lines, but only at the power line frequency and voltage specified on the bottom of the instrument.

## 1-5. SPECIFICATIONS

1-6. The pertinent specifications for the Model 1900A are listed in the following Table 1-1.

Table 1-1. MODEL 1900A SPECIFICATIONS

**OPERATING RANGES****Frequency:**

5 Hz to 80 MHz

**Period:**

5 Hz to 1 MHz single and multiple period averages

**Totalize:**

1 count to 999999 counts

**INPUT CHARACTERISTICS****Sensitivity:**

25 mV, typically 15 mV rms sine wave, 5 Hz to 80 MHz

Frequency and totalize: 200 mV P-P pulse amplitude with minimum pulse width of 20 nsec. Duty cycle &gt; 10%.

Period: 200 mV P-P pulse amplitude with minimum pulse width of 200 nsec. Duty cycle &gt; 10%.

**Impedance:**1 M $\Omega$  shunted by less than 30 pf for signal levels < 500 mV decreasing to approx. 220K shunted by less than 40 pf for levels greater than 500 mV.**Filter:**

1 MHz (3dB point) lowpass

**Attenuator:**

Decreases sensitivity by 10

**Overload:**

250V rms 5 Hz to 1 kHz decreasing to 20V at 80 MHz

**RESOLUTION****Frequency:**

Four manually selected gate times of:

10ms (100 Hz resolution)

100ms ( 10 Hz resolution)

1s ( 1 Hz resolution)

10s ( 0.1 Hz resolution)

Autorange position will automatically seek to fill all 6 digits but will not select a gate time greater than 1 second (1 Hz resolution)

**Period:**Manual selection of single period through  $10^3$  periods averaged ratios: $10^0$  single period (100 ns resolution) $10^1$  periods averaged (10 ns resolution) $10^2$  periods averaged (1 ns resolution) $10^3$  periods averaged (100 ps resolution)Autorange position will automatically seek to fill all 6 digits. Autoranging will not select a period average of greater than  $10^2$  averages.**Totalizing:**

Accumulates up to 999999 counts, then activates overflow indicator.

**TIME BASE CHARACTERISTICS****Frequency:** 10 MHz**Stability:**Aging Rate: <  $\pm 5 \times 10^{-7}$  monthShort Term: <  $\pm 5 \times 10^{-8}$  over 1 secondTemperature: <  $\pm 5 \times 10^{-6}$  0°C to 50°C  
<  $\pm 2 \times 10^{-6}$  (typical) 20°C to 30°C**Line Variation:**<  $\pm 1 \times 10^{-7}$  for  $\pm 10\%$  variation in line voltage**GENERAL****Display:**

6 digit LED, leading zero suppression

Time between successive measurements is 200 ms plus measurement time

**Annunciation:**MHz, kHz, msec,  $\mu$ s overflow**Automatic Features:****AUTORANGE:**

In both frequency and period modes, autoranging includes a unique 20% hysteresis in its switching thresholds, to eliminate redundant up range/down range commands. This allows measurements to be made on signals containing large amounts of FM and PM.

Hysteresis memory can be reset by depressing the reset button.

**AUTORESET:**

A new measurement sequence is started every time a front panel button is activated.

**Operating Temp:** 0°C to +50°C (0°C to +40°C for -01 Battery option if operated from line.**Storage Temp:** -40°C to +60°C**Power Requirements:**115/230 VAC  $\pm 10\%$  - 100 VAC available - 50, 60,

400 Hz - 6.5 watts line model - 8.5 watts battery model

**Fuses:**1/4A AC-line version- $\frac{1}{2}$  A slo-blo battery version**DIMENSIONS**

<b>Width:</b>	8.55 inches	217.2 mm
<b>Height:</b>	2.52 inches	64.0 mm
<b>Depth:</b>	10.65 inches	270.5 mm
<b>Weight:</b>	2.75 lbs	1.2 Kg

**DATA OUTPUT OPTION**

8-4-2-1 BCD output from each digit, plus encoded decimal point and units annunciation information. All outputs CMOS/Low Power TTL compatible, high true. Print command is provided.

**BATTERY**NICAD rechargeable - discharge time 5 hours - charge time 14 hours @  $\leq 30^\circ\text{C}$  ambient with unit inoperative.