



OPERATING INSTRUCTIONS  
**FREQUENCY  
COUNTER  
SERIES**



- **F1000-C**
- **F2700-C**

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## INTRODUCTION

The instrument is a multi-function and equal accuracy counter.

### Features

Eight digits, bright seven-segment LED display, four function performance, low power dissipation circuit design, small size, light weight, high stability crystal oscillators ensure accuracy of measurement and full input signals conditioning.

### Four functions

Frequency, period, totaling and self-checking. All functions are accomplished by a monolithic large-scale micro-processor. The input signals can be conditioned by attenuation. The position of switches, indicators, wiring terminals and all specifications are provided in this booklet. Before operate this unit, please refer to this instruction manual thoroughly for better use.

## SPECIFICATIONS

### 1. Methods of Measurement

#### Frequency Measurement

##### CHANNEL 1

- Range: 10Hz ~10MHz direct counter  
10MHz ~100MHz scale by proportion
- Resolution: direct counter: 1Hz, 10Hz, 100Hz  
scale by proportion: 10Hz, 100Hz, 1000Hz
- Sampling time: 0.01s, 0.1s, 1s
- Accuracy:  $\pm$  Timebase error  $\pm$  Trigger error  
 $\times$  Measured frequency  $\pm$  LSD  
LSD = 100ns/ Sampling time  $\times$  Measured  
frequency (or Measured period)

##### CHANNEL 2

- Measurement range:  
F1000-C Model:  
100MHz ~1000MHz scale by proportion  
F2700-C Model:  
100MHz ~2700MHz scale by proportion
- Resolution:  
Scale by proportion: 100Hz, 1KHz, 10KHz  
Sampling time: 0.01s, 0.1s, 1s  
Accuracy:  $\pm$  Timebase error  $\pm$  Trigger error  
 $\times$  Measured frequency  $\pm$  LSD

#### Period Measurement

Input: Channel 1      Range: 10Hz ~10MHz  
Resolution:  $10^{-7}$ S,  $10^{-8}$ S,  $10^{-9}$ S  
Accuracy:  $\pm$  Timebase error  $\pm$  Trigger error  
 $\times$  Measured frequency  $\pm$  LSD

#### Totaling Measurement

Input: Channel 1      Range: 10Hz ~10MHz  
Resolution: 1 count pulse

#### Self-Checking

Display: 8 bits LED, 0-9 repeatedly display

## 2. Input Characteristic

### CHANNEL 1

- Input Sensibility:
 

10MHz range: 10Hz ~8MHz	20mVrms
8MHz ~10MHz	30mVrms
100MHz range: 10MHz ~8MHz	20mVrms
80MHz ~100MHz	30mVrms
- Attenuation:  $\times 1, 1/20$
- Filtering: Lowpass, 100KHz, -3dB
- Impedance: approx.  $1M\Omega$  (less than 35pF)
- Maximum Safety Voltage: 250V (DC+ACrms)  
(set ATT on 1/20)

### CHANNEL 2

- Input Sensibility:
 

<u>F1000-C</u> : 25mVrms	
<u>F2700-C</u> : 100MHz ~2400MHz	30mVrms
2400MHz ~2700MHz	75mVrms
- Impedance: approx.  $50\Omega$
- Maximum Safety Voltage: 3V

## 3. Timebase

- Timebase Frequency: 10MHz
- Short-term Stability:  $\pm 3 \times 10^{-9}$ /S
- Long-term Stability:  $\pm 2 \times 10^{-5}$ /month
- Temperature Coefficient:  $\pm 1 \times 10^{-5}$ ,  $0^\circ\text{C} \sim 40^\circ\text{C}$
- Line Voltage: every  $\pm 10\%$  vary based on every  
 $\pm 1 \times 10^{-7}$  vary of timebase frequency

## 4. General Conditions

- Display: 8 digits, 0.39 inch red bright LED display with decimal point, sampling, overflow, KHz, MHz,  $\mu\text{s}$  indication.
- Power Requirement: AC  $110 \pm 10\%$  50Hz
- Starting Time: 20 minutes when temperature

below 25°C

- Temperature: Operating: -5°C ~ +50°C  
Storage and Transportation: -40°C ~ +60°C
- Humidity: Operating: 10 ~ 90%RH  
Storage: 5 ~ 95%RH

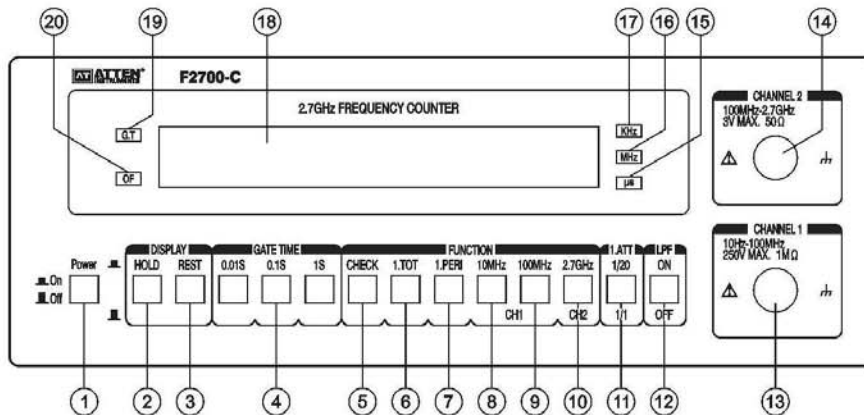
## OPERATION

### 1. Before Operation

- Power Requirement:  
AC 110±10%, 50Hz Single-phase, Maximum Power Consumption is 10W.
- It requires to be warm up 20 minutes in advance before operation so as to ensure frequency stability of the crystal oscillator.

### 2. Features of Front Panel:

- 6) **1.TOT** Total measurement.(Channel 1 available)
- 7) **1.PERI** Period measurement.(Channel 1 available)
- 8) **CH1 10MHz** 10Hz ~10MHz range selectable. (Channel 1 input)
- 9) **CH1 100MHz** 10MHz ~100MHz range selectable. (Channel 1 input)
- 10) **CH2 F1000-C** 1GHz: 100 MHz ~1GHz range selectable. (Channel 2 input)  
**F2700-C** 2.7GHz: 100 MHz ~2.7GHz range selectable. (Channel 2 input)
- 11) **1.ATT** Switch of input signal attenuator. Input sensibility is attenuated by 20 times when press down. (only Channel 1)
- 12) **LPF** Low Pass Filter, AC100KHz, -3dB.
- 13) **CHANNEL1** Input of Channel 1. Press "1.ATT" to lower the input signal when the input signal exceed 300mV, can improve accuracy of measured value.
- 14) **CHANNEL2** Input of Channel 2



- 1) **POWER** Press down to switch on, F1000-C displays "F-1000-L" in two seconds F2700-C displays "F-2000-L" in two seconds
- 2) **HOLD** Press down to pause measuring and holding the current data.
- 3) **REST** Press down to immediately reset the counter and start a new period of measurement.
- 4) **GATE TIME** Select different resolutions and counting periods by measuring frequency and period.
- 5) **CHECK** Check the unit status, as well as 8 bits display 0-9 repeatedly and simultaneously by press it.

- 15) **μs** period unit.
- 16) **MHz** frequency unit.
- 17) **KHz** frequency unit.
- 18) **Display**
- 19) **GT** Sampling status, indicator on means sampling.
- 20) **OF** Overflow, indicator on means exceed 8 digits.

**Note:** All the function keys are released.  
F1000-C displays "F-1000-L",  
F2700-C displays "F-2000-L".  
F1000-C front panel refer to F2700-C.