Universal Counter LE-12A

Parts List:

Universal Counter
Instructions

Additional Materials(Optional)

• Ring Stand
• Halls Car with Picker Fence
• Air Track
• Free Fall Picket Fence
• Single and U-shaped triggers

Warranty,Replacement Parts:

We repalce all defective or missing Parts free of charge.Additional re-Placement parts may be ordered.We Accept Mastercard,Visa,American Express,and school P.Os.All products Warranted to be free from defect for 90 days.Does not apply to accident, Misuse,or normal wear and tear.

Introduction:

The counter adopts monolithic microprocessor and progarm control.It is the latest designed intelligent instrument. It can be widely applied to variousexperiments such as timing,frequency counting, counting and velocity determination. When fitting the air track, it has special functions such as converting measured time into velocity and accelerations, except for the same functions as common digital timers. You can easily finish air track experiments by using it, and can get explicit data. In order to operate it easier for users, only four operation keys are set and ten converible functions are given at the same time. Time bases are orientated automatically according to the experimental result. If you choose arbitrarily the number of photoelectric thresholds during the experiment, the instrument can judge this number automatically. The data collected are all light-barrier frontier trigger. Read this manual carefully before using the counter, and you can feel convenient and easy to do experiments.

Functions of the keys:

Mode Key:used to select from the ten functions, and clear the displaying data and reset. When there is input photoelectric signal,press this button, the counter will reset. While there is no input photoelectric signal, press this button, the counter will be ready for next experiment.

Function key:used to determine the width of the light barrier and the period of harmonic motion, and convert measuring unit. Whenever you start the instrument, the width of the light barrier will be set to 1cm automaticly. This key also used to change the output frequency in mode ten.

Recall Key:When use the cycle mode, the instrument will memorize 20 latest numerial values automatically By pressing this button, you can see these 20 values.

Magnet ON/OFF Key: Pressing this key, to change sucking (LED is light near the key) or lowering (LED is dark) of electromagnetic.

Function and Operation:

Timing1 Record the cover Light time of every photo-electrix switch. Pressing function key to convert measuring unit between time and velocity.

Timing2 Measure the time used while the slipper moves from p1 to p2.

Acceleration

Measure the velocity of the slipper to pass through exery threshold and time to pass through the adjacent threshold, or the acceration when passing through this distance. The instrument will display the following data cyclically:

1	first threshold
xxxxxx	data of first
2	second threshold
xxxxxx	data of second
1-2	from first to second threshold
xxxxxx	data from first tosecond

Press function key to convert measuring unit between velocity and acceleration.

Collision

Collision of objects with equal or unequal mass. Install two slipper with same-width concave light barrier and colliding spring, and mare slippers move from either end and collide with each oaher after passing through a threshold respective. They pass through the thresholds respectively in terms of their masses and initial velocities after the collision.

The instrument can display following data cyclically:

P1.1	first passage of P1
xxxxxx	first data of P1
P1.2	second passage of P1
xxxxxx	second data of P1
P2.1	first passage of P2
xxxxxx	first data of P2
P2.2	second passage of P2
xxxxxx	second data of P2
P1.3	third passage of P1
xxxxxx	third data of P1
P2.3	third passage of P2
xxxxxx	third data of P2

Cycle

Measure time for 1~9999 period harmonic motion. You can measure in two ways:

>*Without preset period number*

Initial display of period is 0. When a harmonic-motion period completes, the display will increase by 1. Press the function key to stop measurement. The instrument will display the accumelative time automaticlly.

>*With preset period number*

Keep pressing the function key untill you find the period number you need. When a harmonic-motion period completes, the display will reduce by 1. When the last shading ends, the instrument will display the accumulative time automatically.

The instrument can save the previous 20 period data of the current experiment. By pressing memory key, it can display the following data:

1	first period
xxxxxx	time of first period
2	second period
xxxxxx	time of second period
......	......

G-ACC

Plug in the electromagnetic plug and photoelectric plug. When the LED is light near magnet ON/OFF key, to attach the iron ball. Press the electromagnetic key, then iron ball will fall pass the two photoelectric switches. The screen will display the following data:

1	P 1
xxxxxx	t 1
2	P 2
xxxxxx	t 2

$$h_1 = \frac{1}{2} g t_1^2 , h_2 = \frac{1}{2} g t_2^2 .$$

$$G = \frac{2(h_2 - h_1)}{t_2^2 - t_1^2} ,$$

$h_2 - h_1$ is the distance between two photoelectric switchs.

Count

Record the times of cover-light actions.

Input

Measure frequency of the input wave. The input wave can be sinewave, square wave and triangle wave. The frequency range is from

1Hz-20MHz.

Period

Input wave like in input mode, and the instrumnet will display period of the input wave.The range is from 1Hz-200KHz.

Output

In this mode, the instrument works as a signal source, the instrument can export 5V-pulse. You can change frequency by pressing the function key. (1Hz,10Hz,100Hz,1000Hz)

Maintenance

If the counter cannot work with count function,please check the photoelectric threshold first.
Please power off the instrument and keep it away from sunshine.
Please power on the instrument for an hour after six months storage.
Please contact manufactory or professionals for maintenance when you meet other troubles.

Specifications

Display modes:
6 digits LED(1.8″)

Timinrange:
0.00ms—1800s

Counting range:
0--9999

Cycle range
1—9999

Acceleration

0.00cm/s^2 --2000cm/s^2

Raterange:

0.00cm/s—2000cm/s

Frequency range:
1Hz—20MHz

Electric period range:
1Hz—200kHz

Input sensitivity:
0.5V—30V

Signal source export:
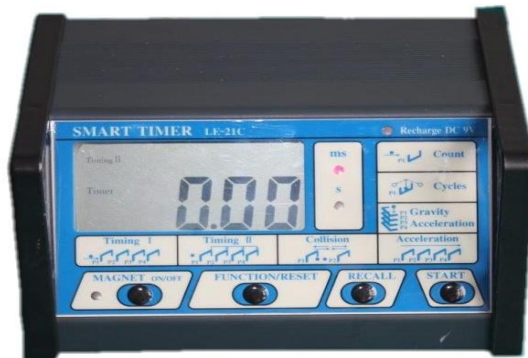1Hz,10Hz,100Hz,1000Hz

Photoelectric input:
2 way,2 inputs

Electromagnetic jack:
1

Power supply:
DC 9V

We Still suggest another two kinds of timer.

LE-21C With four photogates

LE-21E With li-on battery inside