Multi Counter

Timer, Counter, Frequency, Geiger

LB4071-101

Description:

The IEC 'MULTI - COUNTER' is a compact and versatile instrument for general laboratory timing to 0.1 ms, counting, measuring frequency or rate and for performing Geiger counting.

Each of the 3x modes (Timing, Counting/Freq and Geiger) has a set of 'Functions' to select the type of function you want for the mode you selected. All selection is by LED and the indication reminds you always of the mode and function that is operating

Special features are:

- High speed timing to 100 microseconds resolution.
- Large six digit LED display.
- All press button operation with LED indication of functions.
- Automatic loading memory up to a depth of 20 values.
- Memory items can be selectively deleted to remove errors. Memory items can be scrolled, totalled or averaged.
- Sockets for extension speaker.
- Speaker and volume control for all counts and frequency.
- Output sockets for 12V.AC. supply for photogate lamps.
- Accepts both high voltage GM tube and low voltage Alpha detector. Both are available from IEC upon request.
- Start/Stop TIME sockets also operate as remote Start/Stop sockets when running in COUNT, FREQUENCY or GEIGER modes.

Length: 375mm	Depth: 170mm	Height: 107mm	Weight: 2.4kg

Specifications:

POWER: 220/240V.AC 50/60Hz.

ACCURACY: All operations relating to timing and frequency are crystal locked ensuring an accuracy of better than: 0.01% +/-1 least significant digit.

All functions are microprocessor controlled.

Initial Power On:

Units are fitted with IEC 3 pin mains socket to accept separate mains cable. Plug into a standard 240V.AC. power outlet. Digital display should illuminate.

- Small LEDs indicate the Mode of operation and Function.
- Press MODE button to select the Mode of operation required.
- Press FUNCTION button to select Function required in that mode.

Press Button Operations:

- START: initiates timing, counting or Geiger counting.
- STOP: stops timing or counting and value is stored in memory.
- RESET: operates after STOP. Zero display and also performs an AutoMode external connection check on START/STOP sockets.
- MEM UP/MEM DOWN scrolls and recalls active memory locations.

Memory:

When STOP occurs by either press button or by remote socket, the last value is automatically stored into memory. When any value is stored, the small 'MEM' LED is on. When 20 values are stored (memory full), the memory LED flashes.

MEM UP/DOWN

Buttons scroll through the active memory store. When the first or last stored memory is reached, a longer beep sounds.

TOTAL

Button adds all memory values together. Press and hold until double beep is heard. Total of memory values will display whilst button is held depressed.

AVRG

Button calculates the average of all the memory values. Press and hold until double beep is heard. Average will display whilst button is held depressed.

PURGE

Button removes selected memory values. Scroll to select the unwanted value. Press and hold button until double beep is heard. Selection is now erased from memory leaving the other values untouched. Display shows '------'.

CLEAR

Button empties all memory values. Press and hold button until double beep is heard. Memory store will be empty and the small 'MEM' LED will be off.

Modes:

Three different modes of operation are selectable:

- Timing
- Counting & Frequency
- Geiger counting.

Timing:

AutoRange:

0.0001s up to 99.9999 seconds, then AutoRanges to 999.999 seconds by 0.001s.

Automode:

This function is set by pressing STOP then RESET buttons sequentially. When set, the starting and stopping of timing will occur upon any change of state of the START / STOP electrical connections. This automatic feature can save classroom time and difficulty by eliminating the necessity of creating specific 'making' or 'breaking' external connections for experiments.

There are four different functions of timing:

START/STOP:

When status of the START connections is changed momentarily the timer runs. The start connections then have no effect. When the status of the STOP connections is changed momentarily the timer stops and memory is loaded.

PHOTOGATE:

When status of the START connections is changed the timer runs. When same sockets revert to original status the timer stops and the value is stored in memory. The sockets also provide the power required to run most photogate circuits.

PERIOD:

When the status of the START connections is changed the timer runs. When same sockets revert to original status there is no effect. When same sockets are changed again, the value is stored in memory, the timer is reset and then starts timing the next period. To stop the timing press STOP.

PENDULUM:

When the status of the START connections is changed the timer runs. When same sockets revert to original status there is no effect. When same sockets are changed again, there is no effect. Upon the fourth change, the value is stored in memory, the timer is reset and then starts timing the next pendulum period. To stop timing press STOP. Effectively this is a double ‘PERIOD’.

Counting & Frequency:

The START and STOP buttons or the joining of the TIME START/STOP sockets permits the counting and frequency measurement to Start or Stop. When stopped, the last value is stored into memory.

Input Response:

Pulses of 20mv P/P to 100V can be counted. The sensitivity of the counting input can be adjusted between these limits. For low level pulses, increase SENSITIVITY until steady and reliable counting occurs.

There are four different functions of counting and frequency:

CONTINUOUS:

Counting continues until Stop button pressed or Stop sockets change in state. Value is stored automatically.

100 SEC:

Counts for 100 seconds. After this time has expired, counting stops and the total is displayed. Value is automatically stored into memory.

10 SEC:

Counts for 10 seconds. After this time has expired, counting stops and the total is displayed. Value is automatically stored into memory.

FREQUENCY:

The pulses applied are counted per second and displayed as frequency to a maximum of 999,999Hz. Starting and stopping of the frequency function is performed by the buttons or the sockets in the TIME mode section. Each time the frequency is updated, the last value is automatically stored in memory.

Geiger Counting:

The setting of the GM VOLTS should suit the tube type being used. The normal wide range Alpha, Beta & Gamma halogen quenched GM tube (type MX168 or similar), the voltage should be about 450V.DC. for best reliability and sensitivity.

There are four different functions of Geiger counting:

CONTINUOUS:

Counting continues until STOP button pressed or STOP sockets change state. Each Geiger count applied to the socket is counted. The voltage applied to the GM tube can be adjusted from 200 to 600 V.DC. for optimum sensitivity and for experiments involving 'Plateau Voltages'.

In addition to the normal high voltage GM tube system, IEC manufactures a special solid state ALPHA particle detector, with inbuilt amplifier, which can be used for low level Alpha Particle detection.

TOTAL

Counts over a 10 or a 100 second period: After this time has expired, Geiger counting stops and the total is displayed. Value is automatically stored into memory.

RATE:

The pulses detected are counted per second and displayed as frequency or rate to a maximum of 999,999Hz. Starting and stopping of the frequency function is performed at the buttons or the sockets in the TIME mode section. Each time the function is stopped, the last value is stored in memory.

Speaker:

The instrument has an inbuilt speaker to monitor the 'GM clicks' together with sockets for an extension speaker (8 ohm impedance). A speaker volume control is provided.

Lamp Output:

Output sockets provide 12V.AC. at 1 amp for Photogate lamps etc..

Remote:

Duplicates the RESET button function. Using a long cable, this socket can be joined to the common or 'GRND' socket by a switch or press button to create a remote RESET control.

Optional Accessories:

- Photogates for experiments.
- Geiger Muller Tube with tube holder and lead.
- Solid state ALPHA particle detector with holder and lead.
- Extension speaker, 8 ohm impedance.

Designed and Manufactured in Australia