

MULTI-TIMER - LCD, 200s x 0.0001s

LB4057-001 large 4-1/2 digit LCD display 3x 'AA' cells 20 memory

DESCRIPTION:

The IEC **Multi Timer** is a compact, high speed, portable and accurate instrument with large 4-1/2 digit LCD display. It has been designed for accurate laboratory experimental work and for general classroom use requiring a high resolution of 0.1 milliseconds and 20 memories.

This timer has replaced several of IEC's older models. The useful functions permit:

- Storing of up to 20 readings
- Fast clearing of memory
- Removal of unwanted readings
- Average of all stored readings
- Total of all stored readings.

LB4057-001 LCD timer



Physical size: 170x100x40mm LxWxTh Weight: 0.41 kg

Designed and manufactured in Australia by Industrial Equipment and Control Pty Ltd

Distributed by

Scientrific Pty Ltd

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SPECIFICATIONS:

Max. Time: 199.99 seconds with automatic re-start and count after completion of each maximum time period.

Resolution: High resolution. Unit auto-ranges to provide the best resolution at all ranges.

- 0.0001 seconds (0.1 millisecond) up to 1.9999 seconds.
- 0.001 seconds up to 19.999 seconds
- 0.01 seconds up to 199.99 seconds

Display: Large 4-1/2 digit LCD. 13mm high.

Power: Uses 3x standard 'AA' dry cell batteries. For long life use Alkaline batteries.

Accuracy: Crystal locked accuracy to better than 0.01%. +/- 1 least significant digit.

Memory: Stores up to 20 readings in memory that can be recalled, added, averaged etc.

BATTERY REPLACEMENT:

To replace a set of 3x 'AA' (penlight) batteries, remove one end of the housing with a small Phillips screwdriver and slide out the front panel. The battery holder is mounted on the rear of the circuit board. Use only good quality cells.

AUTO SHUTDOWN:

To conserve battery power, if there has been no button pressed for a period of 2 to 3 minutes, the power turns off automatically. But, when the power is restored by pressing 'ON', the last reading re-appears on the display and all the readings stored in memory are secure.

CONTROLS: manual buttons

START / HOLD: Starts timing function and resets the previous reading to zero. Consecutive readings do not accumulate. If pressed while timing, display 'freezes' while timing continues in the background.

STOP: Stops timing function and automatically stores each reading taken, up to a maximum of 20 readings. **When there is a reading in memory, the decimal point flashes.**

RESET: If timer is stopped when button is pressed, display resets to zero.

ARROWS: Each time the STOP button is pressed, the display is stored in memory. UP arrow recalls latest reading and DOWN arrow steps back through the memory. Beep sounds when either end of the memory store is reached.

(Power) ON: The 'shut-down' timer automatically turns off the instrument when it is not timing for a period of about 2 to 3 minutes. Press the ON button to restore power and to restore the last reading and all the current memories.

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MEMORY FUNCTIONS:

NOTE: For these 'second functions' to occur, buttons must always be held pressed until two beeps are heard.

PURGE: While stepping through the memory store, any selected reading can be removed from the memory. Sometimes readings are known to be in error or perhaps the highest and the lowest reading should be purged prior to finding the average. To PURGE, press and hold the button pressed for a second. Two beeps sound and bars appear on the display.

CLEAR: Completely empties all memory storage. To CLEAR memory storage, press and hold the button pressed for a second. Two beeps sound when the function has occurred and the decimal point stops flashing.

TOTAL: Adds all times stored in memory and displays the total. To TOTAL, press and hold the button pressed for a second. Two beeps sound when the function has occurred.

AVRG: Averages all the reading in the memory store. To AVRG, press and hold the button pressed for a second. Two beeps sound when the function has occurred.

CONTROLS: remote connections

AUTO MODE: An important feature: IEC laboratory timers have a feature called 'Auto Mode'. This means that an experiment can be wired up to normally open or normally closed circuits and the user is not required to arrange any open or closed modes of operation. For example, if the START circuit is open at the time the STOP then RESET buttons are pressed, then closing the circuit will start the timer. If the circuit was closed at the moment the STOP then RESET buttons are pressed, the timing will start when the circuit is opened.

Thus, the user simply connects up the circuit to the Start and Stop sockets, presses STOP then RESET buttons. From that moment, the start / stop functions will operate on a change in state of the connections. This feature is valid on both Maintained and Momentary socket sets.

MAINTAIN: Make the external connections, then press STOP then RESET to set the Mode. When these sockets are changed in state, the timer runs. When original state is restored, the timer stops. A small voltage (4.5V.DC.) at these terminals powers an IEC photogate circuit so that the timer runs when the light beam changes state. Each time a Stop function occurs, the reading is automatically stored into memory (20 readings max.)

MOMENTARY: Make the external connections, then press STOP then RESET to set the Mode. When the START sockets are changed in state momentarily, the timing is latched on. When the STOP sockets are changed in state momentarily, the timing is latched off. Each time a stop function occurs, the reading stores into memory (20 readings max.)

CAUTION: Do not use both Maintained and Momentarily sockets at the same time. Unpredictable results may occur.

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OPERATING INSTRUCTIONS: and examples

MANUAL CONTROL BY BUTTONS:

- Press ON button to power up the instrument.
- Press the START button to start the timing. Notice that the decimal point shifts across as the Auto Range function operates.
- Press the STOP button to read the elapsed time and to store the value into memory. Notice that the decimal point flashes when the memory has a value stored.
- Press the RESET button to zero the display and remain at zero, OR press the START button again to automatically reset the display to zero and re-start timing..

HOLD DISPLAY:

If it is required to 'freeze' the display while timing continues in the background, press and hold depressed the START button while the timer is timing. When the button is released, the current time will again be displayed.

REMOTE CONTROL MAINTAINED:

- Connect a remote device (Photogate or switch etc.) to the RUN/STOP sockets. **NOTE:** that because of the 'Auto Mode' feature, it does not matter if the circuit is normally open circuit or closed.
- 'Auto Mode' the timer by pressing STOP then RESET buttons. Operate the switch. When it changes state the timer will run and when the original state is returned, the timer will stop.
- Connect an IEC photogate to the sockets and 'Auto Mode' the timer. Only while the light beam is broken the timer runs. Cover the light beam and again 'Auto Mode' the timer. The timer will run only when the light beam is not broken. On an Air Track, both the glider's forward and reverse motions (say after a collision) can be timed by the one photo gate. The two times will be automatically stored in memory with the second time in view. To see the first time press DOWN arrow. To again see the second time, press the UP arrow.

REMOTE CONTROL MOMENTARY:

- Connect the remote devices (Photogates or switches etc.) to the START and STOP sockets. **NOTE** that because of the 'Auto Mode' feature, it does not matter if the circuits are normally open circuit or closed.
- 'Auto Mode' the timer by pressing STOP then RESET buttons.
- Operate the remote devices. The first change in state of the external circuits will start and stop the timer. **NOTE:** regardless of the start circuit conditions, the stop circuit always overrides and stops the timing.
- Using photogates, one photogate can start the timing and another can stop the timing. Or a planned event can start the timing and a hand-held press button can stop the timing to check a person's response time.

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