TASKEM CORPORATION

Model 4000
Tachometer/Timer

The Model 4000 Tachometer/Timer displays RPM in both digital and analog formats. The digital format uses a liquid crystal display (LCD) showing up to 19,990 RPM in 10 RPM steps. The LCD is backlighted for night viewing and since it uses "direct drive" it does not washout in sunlight or when viewed from an angle. The analog format is presented as a ring of light emitting diodes (LEDs) around the perimeter of the front panel. The user can easily set the range of RPM that the LEDs represent.

It can be powered from a 9V battery or 12V aircraft power and the DC input is protected for accidental battery reversal. Battery life with a standard 9V alkaline battery is about 24 hours and a LOBAT symbol will flash when less than 4 hours of battery life remains. The three-position POWER switch allows operation with or without backlight.

The analog presentation consists of twelve LEDs, one yellow, ten green and one red. The user can set both the YELLOWLINE and REDLINE thresholds. These are the RPM values where the LEDs transition from yellow to adjacent green and from green to red. The ten green LEDs span the range between these two values uniformly. For instance, if the YELLOWLINE were set to 700 and the REDLINE to 2,700, the ten green LEDs would span 2000 RPM resulting in exactly 200 RPM per step. The YELLOWLINE is to warn that RPM is too low, possibly requiring carburetor heat in the case of carbureted engines, or that engine stall is eminent for injected engines. In the photo, the YELLOWLINE and REDLINE have been set to values typically used with popular 2-stroke engines.

In addition to RPM, the LCD displays total accumulated engine (Hobbs) time and current engine time. Current engine time is cleared to zero each time the engine is first started, thus it very closely represents current flight time and can be observed anytime during flight.

Movable jumper plugs internal to the instrument allow configuring the tachometer for virtually any engine or rotating machinery. Jumper plugs are easily moved and set parameters such as sensitivity, pulses per revolution, noise filtering, display averaging and others.

Installation is straightforward involving only two wires. A detailed Engine Datasheet provides typical electrical connections and jumper plug settings for most popular engines. A magnetic pickup is available for situations where no electrical signal is available.

The instrument also incorporates a computer interface that sends RPM and current flight time to an external recording device such as a laptop computer or printer. Output is true RS-232 format and is encoded as standard ASCII characters making it very simple to interface to.

Finally, the tach/timer is packaged in a standard 3 1/8" instrument case and will fit existing panel cutouts without modification.

SPECIFICATIONS

- **GENERAL**

  - DISPLAY FORMAT: Digital and pseudo-analog.
  - DIGITAL DISPLAY: $4^{1}/_{2}$ digit, high contrast, direct drive liquid crystal display with $^{1}/_{2}$" high characters. All digits and legends visibly tested on power up. Backlight for night or dusk viewing.
  - ANALOG DISPLAY: Light Emitting Diodes, 1 yellow, 10 green, 1 red.
  - DATA UPDATE RATE: 0.6 seconds.
  - TIMING/FREQUENCY REFERENCE: Quartz crystal.
  - ENGINE COMPATIBILITY: Virtually unlimited via selectable sensitivity, noise filtering, pulses per revolution, data averaging and full-wave or no rectification.
  - POWER: 8 to 18VDC @ 23 mA without backlight. Backlight draws additional 11 mA. A 9V battery holder is included on back of instrument.
  - BATTERY LIFE: A 9V alkaline battery will power the instrument for over 24 hours (16 hours with backlight on continuously). 9V lithium batteries will operate approximately 4 times longer than alkaline.
  - LOW BATTERY INDICATOR: A flashing "LOBAT" symbol appears when voltage drops below 7V. At this point an alkaline battery has less than 4 hours life remaining, lithium longer.
  - SERIAL OUTPUT: Asynchronous, bipolar RS-232 with 8 data bits, no parity and 2 stop bits at fixed 9600 Baud. RPM output every 0.6 seconds in ASCII format with Flight Time appended once per minute. Each data set is terminated with carriage return and line feed.
  - WEIGHT: Less than 10 oz. with 9V alkaline battery.
  - DIMENSIONS: Standard $3^{1}/_{8}$" instrument case outline. Depth behind back face of instrument panel (including 9V battery) is $4^{1}/_{2}$".
  - TEMPERATURE RANGE: Full accuracy and performance from -20 to +60°C (-4 to +140°F). LCD response becomes sluggish below -10°C (+14°F).
  - Meets all TSO C49b specifications, but has not been submitted to FAA for certification.

- **TACHOMETER FUNCTIONS**

  - RANGE: 0 to 19,990 RPM
  - RESOLUTION: 10 RPM
  - REDLINE: Flashing red LED when RPM exceeds preset value. Value can be set from 2,000 to 19,950 RPM.
  - YELLOWLINE: Continuous yellow LED when RPM falls below preset limit. Value can be set from zero to 1,500 RPM.
  - GREEN LEDs: Evenly span YELLOWLINE to REDLINE settings.
  - ACCURACY: Better than 0.04% of reading, (4 RPM @ 10,000 RPM).

- **TIMER FUNCTIONS**

  - TOTAL ACCUMULATED ENGINE TIME: 0 to 1,999.9 hours in 0.1 hour (6 minute) steps. Factory resettable.
  - LAST/CURRENT TIME: 0 to 99:59 (99 hours, 59 minutes) in 1 minute increments. Current time is viewable in RPM mode by pressing MODE button.
  - TIMING ACCURACY: Better than 0.04% of reading (0.1 hour @ 250 hours).

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