



Programmable Digital Stroboscope/Tachometer

Models 461840 (110V) and 461841 (220V)



Introduction

Congratulations on your purchase of the Extech 461840/841 Programmable Digital Stroboscope Tachometer. This device can be used to inspect and measure the speed of moving parts such as gears, fans, propellers, centrifuges, and pumps. Careful use of this meter will provide years of reliable service.

Specifications

Display	0.5" 6-digit LED display
Flash rate	10 to 12,000 FPM/RPM
Phase display	$\pm 360^\circ$ or milliseconds (0.1ms <1000 RPM; 0.01ms >1000)
Resolution	0.1 <1000 RPM; 1 >1000 RPM
Accuracy	$\pm (0.05\% \text{ rdg} + 1 \text{ digit})$ from 12 to 11,000 RPM $\pm (0.1\% \text{ rdg} + 1 \text{ digit})$ from 11,000 to 12,000 RPM
Power consumption	< 30 watts
Strobe flash tube type	Xenon lamp (White 6500°K)
Strobe Flash duration	60 to 1000 microseconds
Strobe Flash Energy	4 Watt-Seconds (Joules)
Strobe Beam Angle	80°
Operating conditions	32 to 122°F (0 to 50°C); < 80% Relative Humidity
Housing construction	Impact resistant plastic with plastic lens and mirrored reflectors
Power Supply	110VAC (461840) or 220VAC (461841) at 50/60Hz $\pm 10\%$
Dimensions; Weight	8.3 x 4.8 x 4.8" (21 x 12 x 12cm); 2.2 lbs. (1kg)

Safety Information



This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.



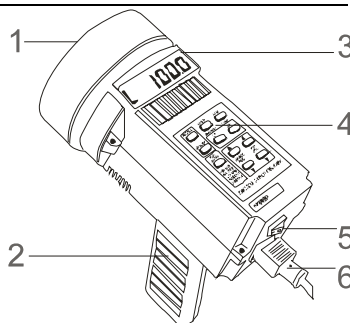
This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present

WARNING: This device causes moving objects to appear still. Precautions should be taken so that accidental contact with moving objects is avoided

WARNING: Replace the lamp when readings appear irregular. Observe a 2-hour use limit for readings < 2000rpm, a 1-hour limit for 2000 to 3600 rpm, a 30-minute limit for 3601 to 8000 rpm, and a 10-minute limit > 8000 rpm. Always permit a 10-minute cool-down between cycles. Never touch the lamp; doing so will shorten the life of the lamp.

Meter Description

- | | |
|---------------------|------------------|
| 1. Xenon Lamp | 4. Keypad |
| 2. Removable handle | 5. ON/OFF switch |
| 3. LED Display | 6. AC Power cord |



Operation

Basic Operation

1. Attach the handle to the meter.
2. Remove power to the moving object under test and affix a target mark on the area to be measured.
3. Plug the supplied power cord first into the meter and then into a proper power source (110V for Model 461840 or 220V for the Model 461841).
4. Power the object under test and then power the meter via the meter's ON/OFF switch.
5. Aim the Stroboscope light beam toward the marked area on the object under test. Use the Coarse and Fine \pm adjust buttons to synchronize or "stop" the motion of the object's mark. A single stationary image of the mark provides actual speed measurement data. The stop-motion action allows the user to inspect the moving object.

RPM-PHASE Button

Use the RPM/PHASE button to select RPM or PHASE displays. In RPM mode the meter displays the frequency of the moving object (the "HXXXXX" display is the high resolution mode and the "LXXXXX" display is the low resolution mode). 'P' indicates PHASE which is discussed on the next page.

Resolution selection

The following table describes the relationship between Resolution, Range, and Coarse/Fine adjustments. Use the HI/LO button to select high or low resolution.

	Range	High Resolution Display	Low Resolution Display
FINE Adjust	10 to 999.9	0.1	1
	> 1000	1	10
COARSE Adjust	10 to 999.9	1	10
	> 1000	10	100

Coarse Adjust

While pointing the meter towards the object under test, press the plus (+) or minus (-) Coarse Adjust buttons to raise or lower frequency to approximate the speed of the moving object under test. Adjust the Coarse controls until the object slows almost to a stop.

Fine Adjust

While pointing the meter towards the moving object, press the plus (+) or minus (-) Fine Adjust buttons to raise/lower the frequency to exactly match the speed of the object. When the frequency matches the speed of the object, the object will appear still.

Fast Finder Button

If the approximate value of the measurement is known beforehand, the time-saving Fast Finder button can be used to scroll quickly to the following display points: 100, 500, 1000, 2000, or 5000. From there, adjust the Coarse/Fine \pm buttons to dial in the exact frequency.

X2 and $\div 2$ buttons

Use the x2 and $\div 2$ buttons to double or halve the frequency. This feature is useful when determining if the reading is a 'harmonic' (see below).

Harmonic Measurements

Ensure that the meter is providing a 1:1 measurement by checking that there is only one mark and not two, four, or more stationary marks on the object under test. Two or more stopped marks indicate harmonic measurements (2:1, 3:1, 4:1 etc.) which provide a doubling, tripling, or quadrupling of the actual speed. Adjust the FINE/COARSE knobs until two images (marks) appear and then lower the flash rate until a single, stationary image appears. This is the actual speed.

Phase Adjustment

To inspect a moving object, first stop motion as previously described; then select Phase (P) using the RPM/PHASE button. To move the object for complete viewing use the Coarse/Fine adjustment buttons (± 360 degrees). The Phase adjust fixes the RPM value while allowing the phase to be changed, in this manner a complete visual inspection can be accomplished on a moving device. The unit of measure for phase can be degrees (P xxx display) or milliseconds (t xxx display). Use the DEGREE/MS button to select the units. Use the PHASE ZERO key to zero the phase after stopping motion on an object.

Memory and Recall

After a measurement has been set up appropriately, press the MEMORY button to store the reading (two readings can be stored). Use the RECALL button to recall a reading. Subsequent stored readings will overwrite existing readings.

Calibration and Repair Services

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.



Support Hotlines (781) 890-7440

Tech support: Ext. 200 Repair>Returns: Ext. 210

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