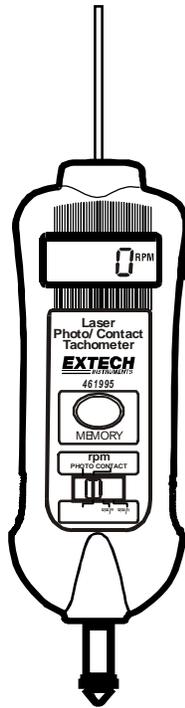


User's Manual



Model 461995

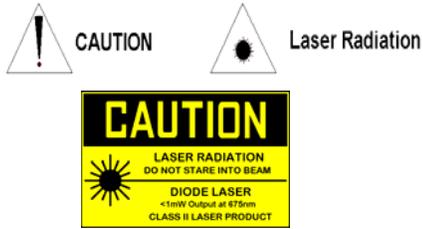
Laser Photo / Contact Tachometer



Introduction

Congratulations on your purchase of Extech's Laser Photo/Contact Tachometer, Model 461995. This Tachometer provides contact/non-contact RPM and Linear Surface Speed measurements. The laser pointer beam provides accurate long distance measurements for photo tachometer measurements. This meter, with proper care, will provide years of safe reliable service.

Safety



1. Use extreme caution when the laser beam is on
2. Do not point the beam toward anyone's eye
3. Be careful not to let the beam strike the eye from a reflective surface
4. Do not use the laser near explosive gases or in other potentially explosive areas

Warranty

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

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Support Hotline (781) 890-7440
Tech support: Ext. 200; Email: support@extech.com
Repair>Returns: Ext. 210; Email: repair@extech.com

Specifications

General Specifications

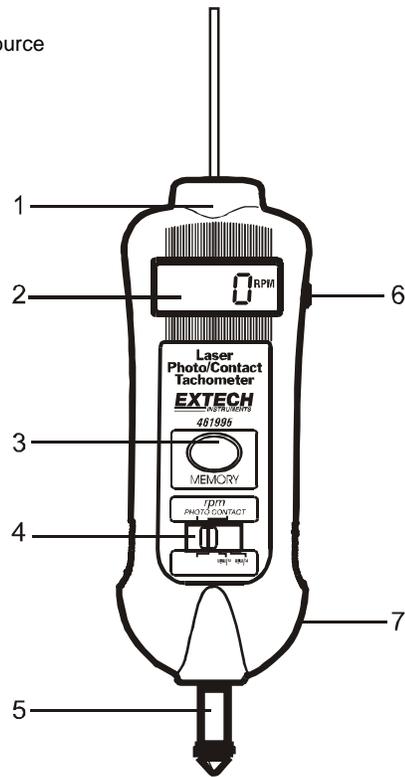
Circuit	Custom one-chip LSI microprocessor circuit
Time base	Quartz crystal 4.194 MHz
Display	Reversible 5 digit 0.4" (10mm) LCD display
Laser light source	Less than 1mW; Class 2 red laser diode (645nm approx.)
Detecting Distance	2 to 79" (50 to 2000 mm) depending on ambient light and RPM
Memory	Last reading and MIN/MAX readings
Operating Conditions	32 °F to 122 °F (0 °C to 50 °C); RH 80% Max
Power Supply	4 x 1.5 V AA batteries
Power Consumption	20mA DC approx.
Weight	10.6oz. (300g) including battery
Size	8.5 x 2.6 x 1.5" (210 x 67 x 38 mm)
Accessories	(4)1.5V batteries, reflective tape 24" [600mm], surface speed/rpm rotating attachments, and carrying case

Range Specifications

	Range	Resolution	Accuracy (%rdg)
Photo Tachometer	10 to 99,999 rpm	0.1 rpm (<1000rpm) 1 rpm (>1000 rpm)	± (0.05% + 1d)
Contact Tachometer	0.5 to 19,999 rpm	0.1 rpm (<1000rpm) 1 rpm (>1000 rpm)	
Surface Speed	0.2 to 6560 ft/min	0.1 ft/min (<1000ft/min) 1 ft/min (>1000ft/min)	± (1% + 1d)
Surface Speed	0.05 to 1999.9 m/min	0.01 m/min (<100m/min) 0.1 m/min (>100 m/min)	

Meter Description

1. Photo Tachometer sensor and laser source
2. LCD display
3. MEMORY button
4. Function switch
5. Contact tachometer rotating ring
6. MEASURE button
7. Battery compartment (rear)



Meter Operation

Reversible LCD Display

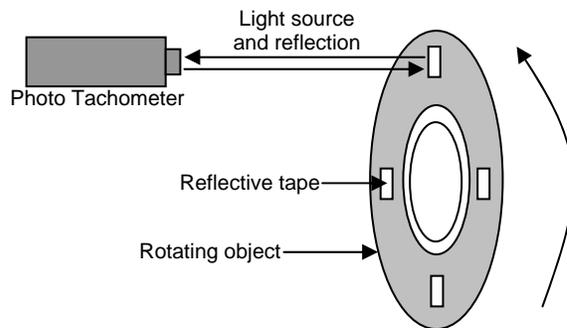
The 461995 LCD display indicates Photo Tachometer measurements in one direction and Contact measurements in the opposite direction. This permits the user to easily read the measurement digits in both measurement modes with the meter held in either direction.

Photo Tachometer Measurements (refer to diagram below)

1. Apply an appropriately sized square piece of reflective tape to the surface of the object under test.
2. Move the Function switch to the PHOTO position.
3. Point the laser pointer end of the meter toward the device under test at a distance of 2" to 79" (50 to 2000mm).
4. Press the Measure button (located on the right side of the meter) and align the laser pointer beam with the reflective tape.
5. Verify that the Monitor Indicator appears on the upper left hand section of the LCD when the object under test passes through the light beam.
6. Release the Measure button when the RPM reading stabilizes on the LCD.
7. If the rpm is under 50, apply additional squares of reflective tape. Divide the reading shown on the display by the number of pieces of reflective tape squares to calculate the actual rpm.

NOTE: Bright ambient light may interfere with the reflected light beam. Shading the target area may be necessary in some cases.

CAUTION: Rotating objects can be dangerous. Use extreme care.



Contact Tachometer RPM Measurements

1. Move the Function switch to the CONTACT position.
2. Press the Measure button while lightly pressing the rotating ring against the center opening of a rotating shaft.
3. Release the Measure button when the display stabilizes (approx. 2 seconds).

Linear Surface Speed (ft/min or m/min) Measurements

1. Slide the Function Switch to "SURFACE SPEED ft/min" or "m/min" position.
2. Install the surface speed attachment on the meter rotating ring.
3. Press the Measure button and hold the surface speed wheel against the device being measured.
4. Release the Measure button when the display stabilizes (approx. 2 seconds).

MIN/MAX and Last Reading Memory Recall

The 461995 can record Maximum, Minimum, and Last Reading for the period of time the Measure button is held. These stored values can then be read directly on the meter's display. The memory will automatically clear after approximately 10 seconds of meter inactivity. Access the memory data immediately after the measurements have been taken as follows:

1. Press the Memory key once and hold it down: The Last Reading is displayed followed by the "LA" icon.
2. Press again and hold: The Maximum value is displayed followed by the "UP" icon
3. Press again and hold: The Minimum value is displayed followed by the "dn" icon

Battery Replacement

The low battery indication appears as "LO" on the display. To replace the batteries, slide the rear battery compartment cover off of the meter, replace the four 1.5V AA batteries, and replace cover.

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 ensure calibration integrity.