



**TIF780**  
**Infrared**  
**Phototachometer**

OWNER'S MANUAL



## INTRODUCTION

Thank you for purchasing TIF's Digital Infrared Phototachometer. This unit has been designed and built to provide years of reliable use. Please read this manual carefully before using your new Phototachometer in order to obtain the full benefits it provides.

The Infrared light employed by this unit is unaffected by ambient visible light (such as shop lighting and sunlight) and enables readings to be taken at greater distances and angles of incidence than many other optical tachometers.

New features such as an On-Target Indicator and Memory Hold simplify operation and expand versatility. This unit is designed for use on ANY rotating object, from engines to pulleys, from motors to fans. Non-contact readings result in no torque loss, and save time by eliminating mechanical or electrical connections. The unique case design enables readings in close quarters and difficult to access areas. All combine to provide you with one of the best Tachometers available.

If you have any questions or problems regarding your new unit, please call our Toll Free Customer Service Hotline at 1-800-327-5060.

## FEATURES

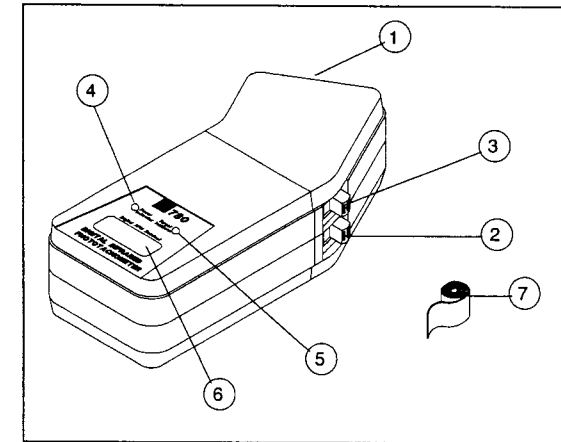
- Reads RPM up to 20,000 with a 1 RPM resolution
- Lightweight and Portable
- On-Target Indicator to ensure proper aim
- Auto Memory Hold
- Auto Power Off
- Low Battery Indicator
- Infrared light not affected by ambient interference
- Rugged Polypropylene housing
- 4 1/2 digit LCD readout
- Self Calibrating
- Low and High Ranges for greater accuracy
- Reflective Tape Included
- Made in USA
- One Year Warranty

Test Equipment Depot - 800.517.8431 - 99 Washington Street Melrose, MA 02176

FAX 781.665.0780 - TestEquipmentDepot.com

## PARTS & CONTROLS

1. Infrared Lenses
2. Power Switch, see p. 4
3. Range Switch, see p. 5
4. Power Light, see p. 4
5. On-Target Indicator, see p. 4
6. Digital Display
7. Reflective Tape, see p. 3, 5



## OPERATING INSTRUCTIONS

Before using your new instrument you must first install the battery as described in the Maintenance Section, page 6.

### Set Up

The TIF780 works by receiving a signal reflected off the object at which it is pointing. In order to achieve this reflection it is necessary to place reflective tape (included) onto the object before measuring its RPM. Proceed as follows:

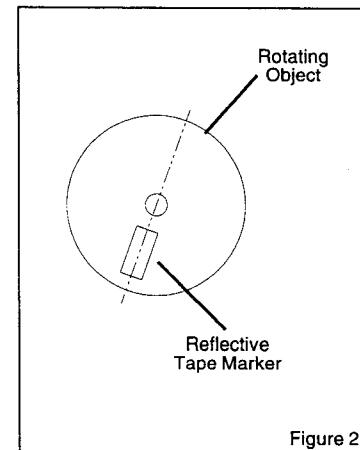


Figure 2

1. Make sure the surface of the object to be measured is relatively clean.
2. Cut a piece of reflective tape approximately 3/4" (2 cm) long and place it on the object to be measured, see Fig. 2. Always place the marker in line with the diameter of the object (as shown by the dotted line in Figure 2.). The size of the object being measured is relevant to the size of the reflective tape marker; on large objects a longer piece of tape will make it easier to obtain readings.

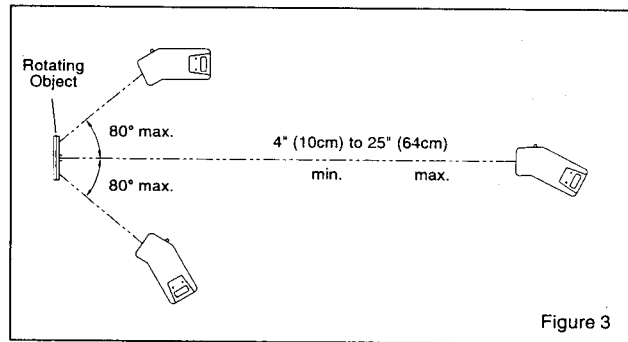
**Note:** For measurement of slowly rotating objects (below 200RPM) multiple marks may be used. Refer to page 5.

# OPERATING INSTRUCTIONS

## Usage

Once the reflective tape is in place readings can be taken:

1. Set the RANGE switch as described on page 5.
2. Activate the 780 by holding the POWER switch down. The POWER light should come on to indicate that the unit is on; momentarily random digits may appear, however the display will remain blank until the unit is aimed at the target (reflective tape). Do not release the power switch until measurements are complete.
3. Aim the 780 towards the object to be measured, keeping within the limits of distance and angle as shown in Figure 3.
4. When properly aimed at the reflective tape the ON-TARGET INDICATOR will light each time the tape mark moves in front of the Infrared beam. Depending upon the rotational speed of the object the On-Target Indicator will blink (low RPM) or glow continuously (high RPM). Adjust the aim to obtain the most consistent blinking or brightest glow. If the On-Target Indicator does not come on, alter the distance and/or angle from the target or consult the Trouble Shooting Guide on page 7.



5. As the 780 measures the RPM the display will rapidly change and then settle on the correct reading. The time to settling is dependent on rotational speed; the slower an object is turning the longer it will take to obtain a reading.
6. To hold a reading, release the POWER switch. The last reading taken will remain on the display for approximately 30 seconds, after which the 780 will switch itself off to conserve the batteries. To resume current readings hold the POWER switch down again.
7. When readings are complete, release the power switch. After displaying a held value for approximately 30 seconds, the unit will switch itself off automatically.

## Operating Tips

After the unit has been powered up the ON TARGET INDICATOR will light whenever the unit is properly aimed, whether the POWER switch is held down or not. Therefore, if additional readings are needed it is possible to aim the unit first, watching the On Target Indicator, and then press the POWER switch only when a reading is needed. Keep in mind, however, that the unit will remain on for only 30 seconds after the switch is released; so new readings must be taken within this time frame.

# OPERATING INSTRUCTIONS

## High/Low Ranges

The TIF780 is equipped with a High/Low Range Switch which will allow you to set the unit to most accurately read a wide range of RPM. Choose the appropriate Range, as indicated below, before taking measurements.

**High Range:** Under most circumstances the High Range should be used. This will allow accurate readings of RPM above 200 in approximately 1.5 seconds. In addition, the High Range will provide quick and accurate tracking of changing RPM.

**Low Range:** If the rotational speed of the object is (or falls) below 200 RPM the Low Range should be used. Readings can be accurately taken down to 80 RPM, however the reading may take longer to stabilize and the unit may not track sudden changes in RPM.

## Multiple Markers

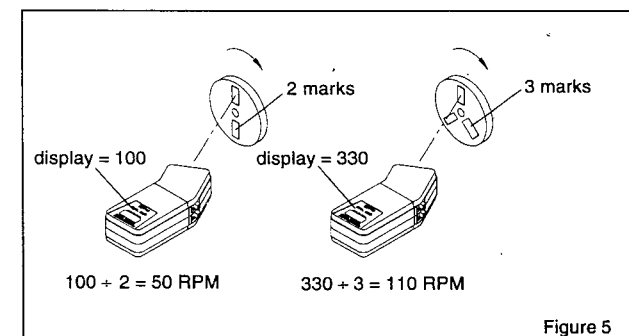
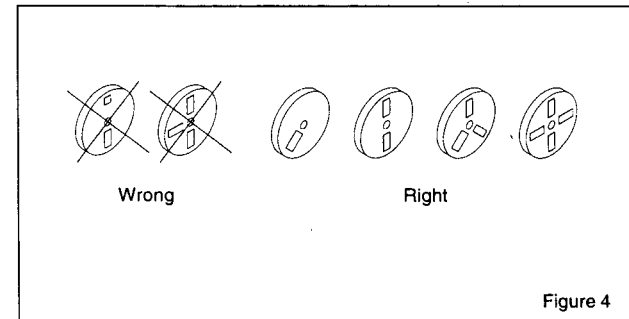
The use of multiple reflective tape markers will expand the range of applications of the TIF780. Multiple markers enable you to:

- a. measure speeds below 80 RPM
- b. use the High range on RPM below 200

When using multiple tape marks remember the following:

1. always use the same size marks (see Figure 4)
2. space the markers evenly (see Figure 4)
3. divide the displayed value by the number of markers to obtain actual RPM (displayed reading ÷ # of marks = actual RPM), see Figure 5.

**Note:** It is recommended that no more than 4 markers be used.



## MAINTENANCE

The TIF780 is maintenance free apart from battery replacement. Avoid severe mechanical shock and temperature extremes. If needed, wipe clean with a damp cloth and mild detergent. Do not soak or immerse the unit and never use solvents to clean the case.

### Battery Installation/Replacement

Upon unpacking the unit and/or when the battery voltage becomes too low it is necessary to install/replace the battery.

When battery voltage is insufficient the POWER light will not come on when the POWER switch is depressed. If this occurs, the battery must be replaced.

1. Open the instrument case as show in Figure 6.
  - a. Insert a small screwdriver, or coin, into the slots as indicated.
  - b. Gently twist the screwdriver, or coin, to pop open the case.
2. The battery compartment is located in the bottom half of the case as indicated in Figure 7. Connect a new 9V alkaline battery to the pigtail connector.

**Note:** Take care not to touch the exposed components or contacts on the Circuit Boards. There is no danger, however care should be taken.

3. After installing battery, close the case by squeezing the halves together until they latch.

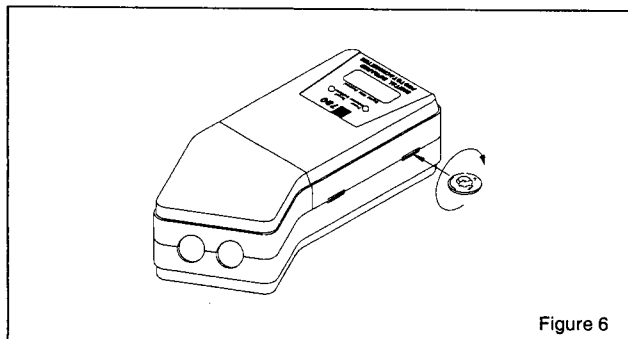
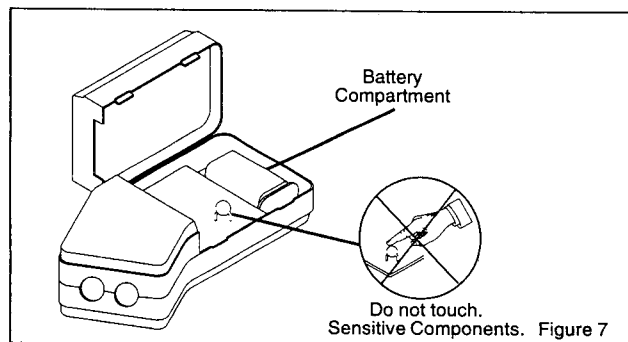


Figure 6



Do not touch. Sensitive Components. Figure 7

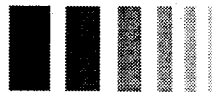
## REPLACEMENT PARTS

Reflective Tape ..... P/N TIF773  
 Carrying Case ..... P/N TIF774

## TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
<ul style="list-style-type: none"> <li>• Display remains blank when POWER switch is depressed.</li> </ul>	<ul style="list-style-type: none"> <li>• The display will not show a reading unless pointed at the tape mark.</li> <li>• Dead Battery</li> </ul>	<ul style="list-style-type: none"> <li>• If POWER light is on, aim at target to obtain reading</li> <li>• Check POWER light, replace battery, see p. 6.</li> </ul>
<ul style="list-style-type: none"> <li>• On Target LED will not light</li> </ul>	<ul style="list-style-type: none"> <li>• No reflective tape mark on object</li> <li>• Too close or too far from object</li> <li>• Too small a marker on object</li> <li>• Unit not properly aimed at target.</li> </ul>	<ul style="list-style-type: none"> <li>• Place marker on object, see p. 3.</li> <li>• Consult usage section, p. 4.</li> <li>• Try larger piece of reflective tape.</li> <li>• Move unit until ON TARGET Indicator lights.</li> </ul>
<ul style="list-style-type: none"> <li>• Erratic or unstable reading</li> </ul>	<ul style="list-style-type: none"> <li>• Incorrect Range selected</li> <li>• Object rotating less than 80 RPM</li> <li>• Unit is too far from object</li> <li>• Unit is not being held steadily</li> <li>• Object not maintaining constant RPM</li> </ul>	<ul style="list-style-type: none"> <li>• Use HIGH range above 200 RPM; LOW range below 200 RPM</li> <li>• Select LOW range and use additional markers, see p. 5.</li> <li>• Consult Usage section, p. 4 or use larger marker</li> <li>• Use prop or stand to steady unit.</li> <li>• Use HIGH range to track changes accurately</li> </ul>
<ul style="list-style-type: none"> <li>• Power light does not come on when switch is depressed</li> </ul>	<ul style="list-style-type: none"> <li>• Dead Battery</li> </ul>	<ul style="list-style-type: none"> <li>• Replace as described, p. 6.</li> </ul>
<ul style="list-style-type: none"> <li>• Unit does not shut off when POWER switch is released</li> </ul>	<ul style="list-style-type: none"> <li>• The 780 will hold a display for approximately 30 seconds, before switching itself off.</li> </ul>	<ul style="list-style-type: none"> <li>• Wait for auto-shut-off</li> </ul>
<ul style="list-style-type: none"> <li>• Reading stays on display when not pointed at target</li> </ul>	<ul style="list-style-type: none"> <li>• Power switch has been released and unit has entered 'hold' mode</li> </ul>	<ul style="list-style-type: none"> <li>• Normal operation, disregard</li> </ul>

## SPECIFICATIONS



<b>Display:</b>	4 1/2 Digit Liquid Crystal Display (LCD)
<b>Range:</b>	<b>Low</b> - 80 to 19,999 RPM (Below 80 RPM requires multiple tape marks; above 200 RPM High range provides faster response) <b>High</b> - 200 to 19,999 RPM
<b>Resolution:</b>	1 RPM
<b>Accuracy:</b>	0.1% of reading, or 1 RPM, whichever is greater
<b>Measuring Distance and Angle:</b>	4 inches to 25 inches (10 to 64 cm) distant; maximum angle of incidence 80°.
<b>Sampling Time:</b>	Low Range - 7 seconds maximum High Range - 1.5 seconds maximum
<b>Power Supply:</b>	9VDC
<b>Battery Life:</b>	>100 Hours
<b>Operating Temperature:</b>	32° F to 125° F (0° to 52°C)
<b>Dimensions:</b>	6.5" x 2.5" x 1.75" (16.5 x 6.35 x 4.4 cm)
<b>Weight:</b>	8.5 ounces (238 grams)