

# X<sup>PRO</sup>TEC

## Ultrasonic Distance Meter

### Operation Manual



**X<sup>FTP</sup>**  
TRILITHIC



## About XProTec Pro-Installer Tools

The XProTec line from XFTP is a comprehensive lineup of professional-grade technical tools. These full-featured, field-proven, and easy-to-use tools meet the highest quality standards in the industry, and feature the dependability you expect for complete installation solutions.

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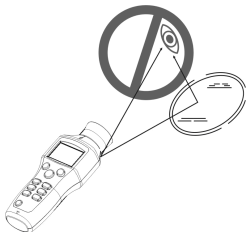
## Safety Instructions & Warnings



**WARNING:** Use of controls or performance of procedures other than those specified herein and failure to follow warnings may result in injury.

The Ultrasonic Distance Meter emits a laser beam from the front side of the unit which projects a visible red spot on the target.

Although the emission power of the laser beam is less than 5 mW (Class IIIa), **DO NOT** point the laser directly at the eye or indirectly by using a reflective surface such as a mirror.



Do not remove the laser warning label from the unit.



## Care & Handling

This unit is a precision instrument which must be handled with care. Take note of the following:

- Avoid dust and water, use a soft cloth to clean the unit.
- Avoid shock, vibrations and extreme heat.
- Keep the unit clean and dry.
- Check the battery regularly to avoid deterioration.
- Power off when not in use.
- Remove the battery if unit is to be stored for an extended period of time.

## Measurement Features

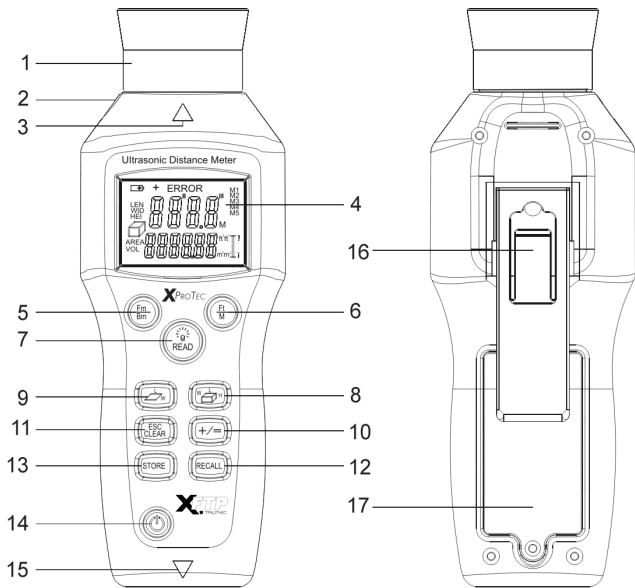
This unit includes the following measurement features;

- Measures in both Imperial (Feet) and Metric (Meters)
- Start point selection
- Storage of up to 5 groups of measurement data
- Recall measurement data stored in memory
- Computes areas and volumes
- Sum of lengths
- Auto shut-off
- LCD backlight
- Audible tones for button press, measurement errors, and measurement confirmation.

## Functional Overview

The diagram shown on the following page represents the basic controls and features of the Ultrasonic Distance Meter.

1. **Ultrasonic Sensor Aperture**
2. **Laser Pointer**
3. **Front Measurement Position**
4. **LCD Display**
5. **Fm/Bm** - This button changes the measurement start point from the front of the unit to the base of the unit.
6. **Ft/M** - This button changes the measurement units between Metric (Meters) and Imperial (Feet).
7. **READ** - This button is used to take a measurement and enable the LCD Display Backlight.
8. **VOLUME** - This button is used to enter the Volume Measurement Mode.
9. **AREA** - This button is used to enter the Area Measurement Mode.
10. **+/=** - This button is used to sum length measurements
11. **ESC CLEAR** - This button is used to return to the Length Measurement Mode or delete measurement data stored in memory.
12. **RECALL** - This button is used to recall stored measurement data.
13. **STORE** - This button is used to store the current measurement data.
14. **POWER** - This button is used to turn the unit ON and OFF.
15. **Base Measurement Position**
16. **Belt Clip**
17. **Battery Cover**



## Measurement Requirements

The following sections describe the environmental and physical requirements necessary for an accurate measurement.

### Environmental Measurement Requirements

Temperature and humidity in different environments affect the speed of sound. When accuracy is critical, make sure the ultrasonic distance meter is used in appropriate environment as follows: indoors or low wind conditions within 0 to 30 °C, 45 to 90 %RH.

### Physical Measurement Requirements

The ultrasonic technology that is used in this unit requires that the unit should be pointed toward the surface of the object to be measured at a right angle both horizontally and vertically. The right angle should be controlled to less than  $\pm 5^\circ$  to obtain the most accurate measurement.

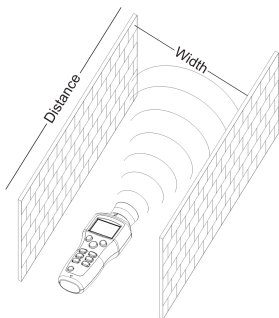
If the surface of the object is very rough, this unit may not be able to obtain a measurement to the precision that is stated in the Specifications Section of this Operation Manual.

When the unit is out of range, there is no return signal and no valid measurement. The LCD Display will show **-ERROR-** and the unit will beep.

To ensure the accuracy of your measurements, please take note of following physical measurement requirements;

- For accurate results, choose a target surface that is large, flat and hard.
- Place sufficiently sized piece of cardboard in front of targets that are too small.

- Although the laser beam can pass through glass, the unit can not take measurements through glass.
- Choose the measurement units before taking your first measurement and do not change the units when you are in the measurement mode.
- When the distance is longer than 12 meters, a strong wind could adversely effect the accuracy of the unit.
- When the distance to be measured is more then 5 meters (15 feet), the width of the area being measured should be greater than 1.5 meters (4.5 feet).
- When the distance is more then 10 meters (30 feet), the width of the area being measured should be greater than 2.5 meters (6.5 feet).



## Initial Setup

Before taking any measurements with the Ultrasonic Distance Finder, perform the actions shown in this section.

### Before Operation

To install a new battery, perform the following steps:

1. Remove one (1) screw from the battery cover.
2. Remove the battery cover.
3. Connect a standard 9 Volt battery to the unit and replace the cover and screw.

### Backlight Operation

Press the **POWER** Button to turn on and activate the LCD Backlight for approximately 7 seconds. Also, pressing any function button will activate the backlight for a few seconds when the function is performed.

### Measurement Units

To select the measurement units press the **Ft/M** Button. You can select either Metric (Meters) or Imperial (Feet) measurements.

### Measurement Start Point

To select the measurement start point press the **Fm/Bm** Button. You can select between either Front of Meter (**Fm**) or Base of Meter (**Bm**).

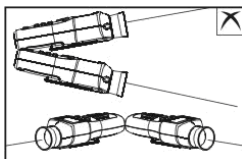
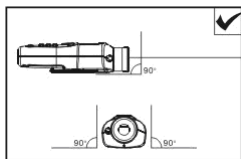
## Measurement Instructions

The Ultrasonic Distance Meter allows you to take measurements for: length, area, volume, and summation of lengths. See the following sections for instructions on how to take each of these types of measurements.

### Measuring Length

Perform the following steps to take a length measurement;

1. Press the **POWER** Button to turn the meter ON.
2. The default reading on the screen displays 0.00'.
3. Hold the unit perpendicular and straight to the target and press the **READ** Button for approximately one (1) second.



4. The unit begins the distance measurement from the selected front or base (**Fm** or **Bm**) of the unit to the location of the red point emitted by the laser beam.
5. If you press and hold the **READ** Button, the measurement value will dynamically change as you move the unit.
6. Once you release the **READ** Button, the last measurement taken will be shown on the LCD Display.
7. To clear the displayed measurement at any time, press the **ESC CLEAR** Button.

## Measuring Area

Perform the following steps to take an area measurement;

1. To enter the Area Measurement Mode, press the **AREA** Button.
2. Aim the meter at the first target.
3. Press the **READ** Button to measure the first length of the area.
4. Aim the meter at the second target.
5. Press the **READ** Button to measure the second length of the area.
6. After taking the second length measurement, the area measurement will be shown on the LCD Display.
7. To return to the Length Measurement screen at any time, press the **ESC CLEAR** Button.

## Measuring Volume

Perform the following steps to take a volume measurement;

1. To enter the Volume Measurement Mode, press the **VOLUME** Button.
2. Aim the meter at the first target.
3. Press the **READ** Button to measure the 1st length of the volume.
4. Aim the meter at the second target.
5. Press the **READ** Button to measure the 2nd length of the volume.
6. Aim the meter at the third target.
7. Press the **READ** Button to measure the 3rd length of the volume.
8. After taking the third length measurement, the volume measurement will be shown on the LCD Display.
9. To return to the Length Measurement screen at any time, press the **ESC CLEAR** Button.



## Sum of Lengths

Perform the following steps to sum individual length measurements;

1. You can add measurements by pressing the **+/=** Button to enter the Sum Measurement Mode.
2. Press the **READ** Button to take a measurement. Press the **READ** Button again and the Sum will be shown on the LCD Display.
3. The Sum Measurement Mode can only measure length values. The maximum sum measurement is 100 Feet in Imperial Units and 100 Meters in Metric Units.
4. To return to the Length Measurement screen at any time, press the **ESC CLEAR** Button.

## Storing & Deleting Measurement Data

The unit includes five (5) memory locations for storing measurement data including: length, area, volume, and sum.

After a measurement has been taken, press the **STORE** Button to enter it in the next empty memory location.

The data stored in these memory locations will be saved until you press the **ESC CLEAR** Button or when you replace the battery.

Measurement data can be stored in the unit's memory until all of the memory locations have been filled. Once all of the memory locations are full, you will not be able to store any more measurement data until you delete the measurement data in memory as follows. Press and hold the **ESC CLEAR** Button for more than three (3) seconds to delete all of the measurements stored in memory.

## **Recalling Measurement Data**

To recall stored measurement data, press the **RECALL** Button.

Measurement data that is stored in memory will be displayed as follows:

- Length Measurement - Length
- Area Measurement - Length, Width and Area
- Volume Measurement - Length, Width, Height, and Volume.
- Sum Measurement - Total Length.

## **Battery Maintenance**

When the battery power is not sufficient to operate the unit, the LCD Display will show the Low Battery Icon and replacement of the battery is required. To prevent inaccurate measurements, replace the battery as soon as possible.

To replace the battery, perform the following steps;

1. Remove one (1) screw from the battery cover.
2. Remove the battery cover.
3. Disconnect the battery from the unit and replace it with a standard 9 Volt battery and replace the cover and screw.

## Specifications

**Measurement Range:** 1.64 ~ 52.48 feet (0.5 ~ 16 meters)

**Measurement Settings:**

*Fm/Bm* - This button changes the measurement start point from the front of the unit to the base of the unit.

*M/FT* - This button changes the measurement units between Metric and Imperial.

**Accuracy:**  $\pm 1\%$  + 1 of reading, conditions:  $25 \pm 5\text{ }^{\circ}\text{C}$  @ 45 ~ 90 %RH

**Measurement Response Time:** 2 Seconds

**Power Supply:** 9 Volt Battery

**Current Consumption:**

*Stand-By Current:* Less than or equal to 1  $\mu\text{A}$

*Operating Current:* Less than or equal to 60 mA

*Auto Shut-Off:* Approximately 100 Seconds

**LCD Back Light:** Active for approximately 7 Seconds

**Operation Environment:**

*Temperature:* 0 ~ 40  $^{\circ}\text{C}$

*Humidity:* 45 ~ 90 %RH

*Storage Temperature:* -10 ~ 60  $^{\circ}\text{C}$

**Dimensions:** 20 mm x 85 mm x 70 mm

**Weight:** 192 grams

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## Warranty Information

Trilithic, Inc. warrants that each part of this product will be free from defects in materials and workmanship, under normal use, operating conditions and service for a period of one (1) year from date of delivery. Trilithic, Inc.'s obligation under this Warranty shall be limited, at Trilithic, Inc.'s sole option, to replacing the product, or to replacing or repairing any defective part, F.O.B. Indianapolis, Indiana; provided that the Buyer shall give Trilithic, Inc. written notice.

Batteries are not included or covered by this Warranty.

The remedy set forth herein shall be the only remedy available to the Buyer under this Warranty and in no event shall Trilithic, Inc. be liable for incidental or consequential damages for any alleged breach of this Warranty. This Warranty shall not apply to any part of the product which, without fault of Trilithic, Inc., has been subject to alteration, failure caused by a part not supplied by Trilithic, Inc., accident, fire or other casualty, negligence or misuse, or to any cause whatsoever other than as a result of a defect.

Except for the warranty and exclusions set forth above, and the warranties, if any, available to the Buyer from those who supply Trilithic, Inc., there are no warranties, expressed or implied (including without limitation, any implied warranties of merchantability of fitness), with respect to the condition of the product or its suitability for any use intended for it by the Buyer or by the purchaser from the Buyer.





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