



WARRANTY

This warranty is provided by Total Tools (Importing) Pty Ltd of 20 Thackray Road, Port Melbourne, Vic. 3207.

Phone: 03 9261 1900 (we, us, our).

Express warranty

Subject to the exclusions set out below, we warrant that this product will be free from defects in materials or workmanship for a period of 12 months from the date of purchase.

The benefits conferred by this warranty are in addition to all rights and remedies which you may be entitled to under the Australian Consumer Law, and any other statutory rights you may have under other applicable laws. This warranty does not exclude, restrict or modify any such rights or remedies.

Warranty exclusions

This express warranty does not apply where a defect or other issue with the product is caused by normal wear and tear, misuse or abuse of the product.

Consumer guarantees

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Warranty claims

To make a claim under this warranty, you must bring the product along with the proof of purchase and any other documentary evidence which you think is relevant to the Total Tools' place of purchase where the claim will be handled on our behalf. Any cost incurred by you in bringing the product to the place of purchase will be borne by you.

To make a claim under this warranty, the product and proof of purchase must be returned to the Total Tools place of purchase during the warranty period specified above.

If your warranty claim is accepted, we (or the Total Tools store that handles the claim on our behalf) will, at our discretion, repair or replace the product, or refund money to you and take back the product.



DETROIT®

DETROIT®

LASER DISTANCE MEASURER 60m

PART NO.: DETDLM60LI



TO PREVENT SERIOUS INJURY, READ AND UNDERSTAND ALL WARNINGS AND INSTRUCTIONS BEFORE USE.

OPERATING INSTRUCTIONS

MAINTENANCE AND SERVICE

1. Do not attempt to open the instrument. To assure product SAFETY and RELIABILITY, repairs, maintenance and adjustment should be performed by authorized service centers. To locate your nearest service center, contact your dealer.
2. Do not drop, knock, or shake the instrument to avoid affecting precision.
3. Remove batteries when instrument is not in use.
4. Keep the instrument clean at all times. Use a soft cloth with mild soap for body, and lens tissue for glass windows.
5. Don't expose instrument in the sunshine for long time. Take off batteries while the instrument will not be use.
6. 4.2V/1.5A power adaptor work with 3.7V Li-ion battery. Power adaptors can connect to instruments directly to work as power supplier.
7. Never use DC charger to charge alkaline batteries. Remove alkaline batteries when use DC charger to supply power.

TROUBLE SHOOTING

PROBLEM	CAUSE	SOLUTION
Tool cannot be switched on	Battery has low voltage	Charge the battery soon
The tool emits "click" when take a measurement	It is normal, and no cause for concern	N/A
The battery can not be charged while using mobile power or charger	The charging line has wrong connection between tool and charger. The charger or the machine has fault.	Connect the charging line in right way, change a qualified charger, give the machine to the professional maintenance personnel or contact the company for solving fault.
Error codes on LCD in measuring.	Please refer to " Error signals" on page before	Please refer to " Error signals" on page before

SPECIFICATIONS

model	DETDLM60LI
Recommended Use	Indoors
Measuring range	0.15-60m*
Measuring accuracy (2 σ ,	$\pm 1.5\text{mm}^*$
Smallest unit displayed	0.001m
Laser class	2
Laser type	$\lambda=635\text{nm}$ P $\leq 1\text{mW}$
Automatic switch off:	Distance meter: 5 minutes
	Laser: 20 seconds
	Back light: 30 seconds
Battery	500mAH 3.7V Lithium battery
Estimated battery life	Up to 4,000 single measurements
Storage	20
Optimum operating temperature	0 °C to 40°C
Storage temperature	-20 °C to 70°C
Size	122 x 56 x28.5 (mm)

ITEM CHECKLIST

please ensure the following items are included with your laser.
If anything is missing please contact your retailer.



Laser Distance
Measurer



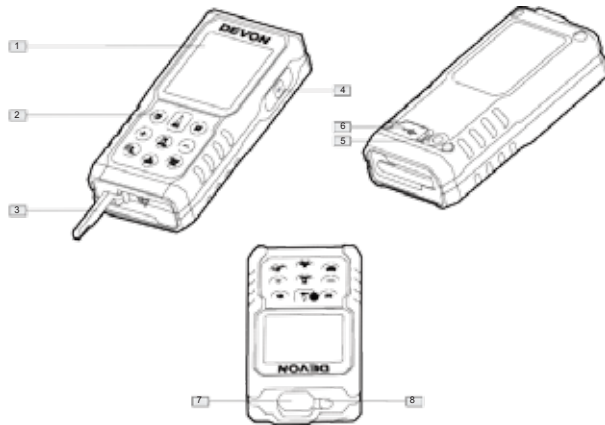
USB charger
cable



Carry pouch

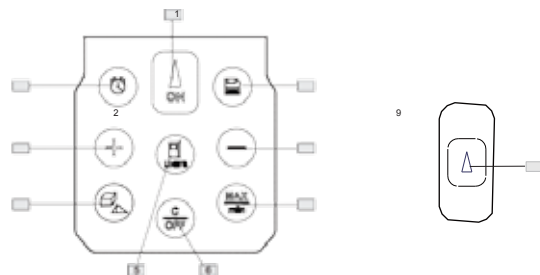
PRODUCT OVERVIEW

1. MAIN PARTS



1. LCD display
2. Keyboard
3. Positioning pin
4. Side measuring button
5. 1/4 inch tripod screw
6. Charging interface
7. Laser-receiving lens
8. Laser-exit aperture

KEYBOARD FUNCTION



- | | |
|--|---------------------------|
| 1. Read/Continuous measuring button | 6. Power/Clear button |
| 2. Timer button | 7. Max/Min button |
| 3. Plus/scrolling button | 8. Minus/scrolling button |
| 4. Function button | 9. Storage/recall button |
| 5. Measuring reference point button/
Unit conversion button | 10. Side measuring button |

LCD DISPLAY ICONS

- Battery indicator
- Indicates that the measurement is taken from the positioning pin.
- Indicates that the measurement is taken from the bottom of the tool.
- Indicates that the measurement is taken from the position of the tripod screw.
- Indicates that the measurement is taken from the front of the tool.
- Laser beam indicator Area measurement Volume measurement
- Area measurement
- Volume measurement
- Single Pythagorean Theorem measurement
- Double Pythagorean Theorem measurement (same direction)
- Double Pythagorean Theorem measurement (opposite direction)
- mass areas measurement
- Maximum measurement indicator
- Minimum measurement indicator
- Continuous
- Reading NO.10 memory date
- Addition measurement
- Subtraction measurement
- Delay measurement
- +
-
- Refresh

OPERATION

OPERATION NOTES

This product is a highly accurate measuring tool. Read and follow all instructions below before operating the product to ensure that the best product performance is maintained.

1. Do not operate and store the product in wet, dusty, sandy, or other adverse environments for a long time. Be in such conditions for a long time may damage inner components and affect the accuracy.
2. When the product is brought into a warm environment from very cold conditions, or vice versa, let the product approach to the surrounding temperature before operation.
3. Avoid heavy impact, long time intense movement or falling when operate and store the product. After these situations happened, please do an accuracy check before continuing to work to ensure the product performance is alright.
4. Measuring errors can occur when measuring toward colorless liquids (e.g., water), clean glass, Styrofoam, or similar translucent and low-density materials.
5. High shiny and reflective surfaces will deflect the laser beam and result in inaccurate measurements.
6. Very bright surroundings combined


with a very low reflecting surface or directing the laser towards the sun or other sources of bright light will reduce the measuring range and accuracy or even result in inaccurate measurements.


- Compact Laser Measuring Tool
- Soft bag
- Charging wire
- Operator's manual

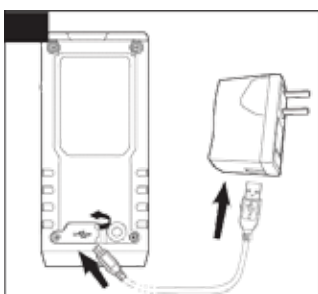
Be sure to check the accessories as it is subject to change by areas and models

Charging Description

The product is equipped with 3.7V 500mAh Li-ion battery. charge the battery with original charging equipment.

 The compact laser measuring tool is shipped partially charged; charge the battery before first use. Optimum performance can be reached by recharging the

tool for approximately 2 hours after use.  It is not recommended to recharge the tool for more than 24 hours after each use.



1. Open the cover and insert the USB interface of the USB charging cable into the power supply.
2. Insert the charging plug into charging port, making sure that they are properly connected.
3. Connect the power supply (together with USB charging cable) to the power outlet. The tool will turn on automatically. The battery indicator will begin to flicker on the LCD display to indicate that the compact laser measuring tool is charging.
4. When charging is complete, the full battery indicator will appear on the LCD display. Remove the USB charging cable from the measuring tool; the tool will turn off within 3 seconds. If the USB charging cable remains connected to the compact laser measuring tool, the tool will remain.

The compact laser measuring tool will not turn off when the USB charging cable is removed during normal charging until 5 minutes have elapsed.



Do not operate the power supply in an area of extreme heat or cold. It works best at normal room temperature. The base of tool or power supply may become warm during charging.

Caution:

1. Please charge and discharge the battery to extend the service life of the battery, while it has not been used for long time.
2. The battery equipped has experience in strict internal quality control process and inspection standards, do not disassemble the battery or replace with other brands, so as to avoid electric shock, explosion, burn and other possible dangers. The battery equipped enjoys the quality assurance. Any repair or disassemble required on battery should be performed only by authorized service personnel or after-sales department.
3. Some normally attenuation will happen in the Li-ion battery after long time working such as two years. Any questions, contact with local qualified service center or after-sales department.

Safety rules of connecting external power supply



Read and follow all instructions below before connect with external power supply such as AC supply and DC mobile power. Failure to follow all instructions below may result in electric shock, explosion, fire and/or serious personal injury.



1. Only choose the qualified and legal adapter which output voltage is 5V and output electricity is 1A .
2. Confirm the adapter suits the AC supply before do connecting.
3. Confirm the mobile power is qualified and legal , the output voltage is 5V and the output electricity is 1A before do connecting.
4. Keep the adapter clean. Check the adapter, cable and plug before do connecting. If damage is detected, do not use or repair by yourself, change the damaged one or get repairs performed by authorized service personnel, otherwise electric shock may occur.
5. Do not do connecting with AC supply on easily inflammable surfaces (e.g., paper,


- Do not do connecting with AC supply on easily inflammable surfaces (e.g., paper, textiles, etc.) or surroundings. The heating of the adapter during using may pose a fire hazard.
- Children or persons with physical, sensory or mental limitations or lack of experience and knowledge are not capable of securely operating the adapter unless they are being given supervision or having been instructed by a responsible person.

TURN THE LASER DISTANCE METER ON AND OFF

- Press the power key  to turn on the tool. The tool will default to the single-distance measuring mode, indicating that the tool is ready to take measurements.
- Press the power key  for about 2 seconds to turn off the tool.
- When the measuring tool is inactive for 5 minutes, it will automatically
- The back light of screen will automatically turn off in 30 seconds without any operation to save battery power.
- Press any buttons to wake up the back light of screen.


Change measuring reference point

The default reference setting is from the rear of the tool.

By pressing the Measuring reference point key , the setting can be changed among the position of the tripod screw, the front of the tool, the positioning pin and the rear of the tool, so the next measurement will be taken from the position you set.


After powering off, the reference point will automatically default back to rear of the tool.

CHANGE THE UNITS

Press the key  to change the units among the choices listed below.

	Distance	Area	Volume
1	0.000 m	0.000 m ²	0.000 m ³
2	0.000 ft	0.000 ft ²	0.000 ft ³
3	0' 00" ^{1/16}	0.000 ft ²	0.000 ft ³
4	0.0 in	0.000 ft ²	0.000 ft ³
5	0 in ^{1/16}	0.000 ft ²	0.000 ft ³

CLEAR FUNCTION

Push the key  to erase the current measurement and display the previous measurement.

While making area, volume,



Pythagorean Theorem measurement and mess areas measurements, each single measurement can be deleted and remeasured in series. Continuously press the key to clear the date and go back to single- distance measurement mode at last.

In recall mode, push the key  to erase the displayed value.

START THE MEASUREMENT **WARNING:** Do not point the

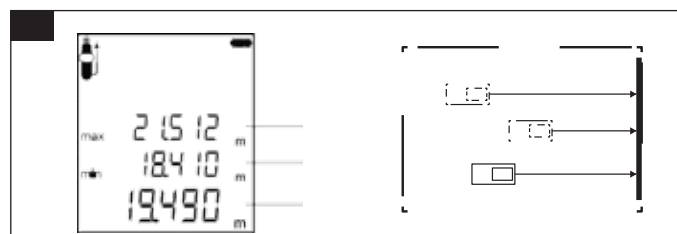
laser dot at persons or animals and do not stare into the laser beam or view directly with optical instruments.

NOTE: The laser will switch off after 20 seconds of inactivity. If a measurement has not been made within the previous 20 seconds, push measure key or side measure key again to turn on the laser.


The machine has side measure key , which is the same with the frontal measure key . No more extra description below.

SINGLE-DISTANCE MEASUREMENT




- Go into Single-distance measurement acquiescently when the machine has been turned on.



The laser beam will turn on.

- Aim the laser at the target to which you want to measure.
- Press the measure key  to take a measurement. The result is displayed immediately on the LCD.

CONTINUOUS MEASUREMENT (LOCATING)

- Press the measure key  for a long time in single-distance measurement to go into continuous measurement mode. There will be "max" and "min" showed on the LCD.
- Press the measure key  to turn on the laser beam. Aim the laser at the target to which you want to measure.
- Press the measure Key  again and move the tool to start measuring.
- The LCD will show the current date at the bottom of the display, and the Minimum or Maximum of last dates with "max" or "min".(Fig.2)


- The LCD will show the current date at the bottom of the display, and the Minimum or Maximum of last dates with "max" or "min".(Fig.2)
- The continuous measurement will automatically stop after 3 minutes. Press any buttons to stop it while it is working.

CHANGE THE FUNCTIONS

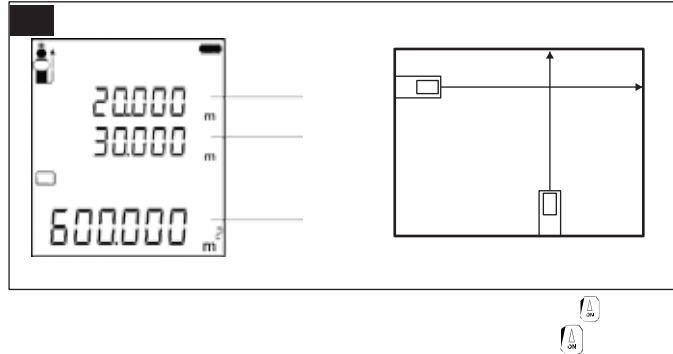
The machine has many functions like area, volume, Pythagorean Theorem measurement and mess areas measurements.



Press the function key  to choose which you want.

AREA MEASUREMENT


Press the function key  to choose area measurement mode; the mode icon will blink on the LCD.





□

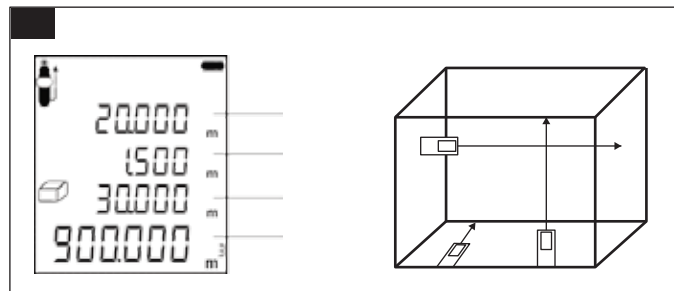


- Press the measure key  to turn on the laser beam, position the tool to aim the laser dot at the target to which you want to measure.
- Press the measure key  to take the first length measurement (e.g. length), press the measure key again to take the second length measurement (e.g. width). The area is displayed immediately on the LCD (Fig.3).

VOLUME MEASUREMENT

Press the function key  to choose volume measurement mode; the mode icon will blink on the LCD.





- Press the measure key  to turn on the laser beam; position the tool to aim the laser dot at the target to which you want to measure. Press the measure key  to take the first length measurement (e.g. length).
- Press the measure key  to take the second measurement
- press the measure key  to take the third length measurement (e.g. width). The volume is displayed immediately on the LCD (Fig.4).

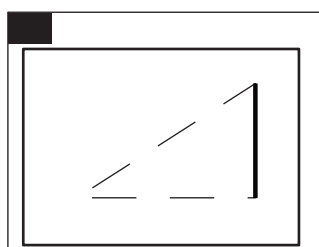


SINGLE PYTHAGOREAN THEOREM MEASUREMENT MODE

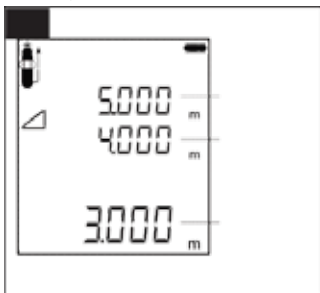
The Pythagorean Theorem measurement mode is used to measure distances that cannot be measured directly because an obstacle would obstruct the laser beam or because no target surface is available as a reflector.

In the illustrated example (Fig. 5), the length BC is unknown distance to be determined. For this purpose, AB and AC must be measured. The lines labeled AC and BC must form a right angle(90°).

- Press the function key  to choose single Pythagorean Theorem measurement mode. The mode icon  will blink on the LCD.
- Press the measure key  to turn on the laser beam. Position the tool to aim the laser at the target B.
- Press the Measure key  to display the measured length of AB in the first row of the screen.
- Without changing the location of the measuring reference point on the tool in position A, aim the laser dot perpendicularly at the target C.



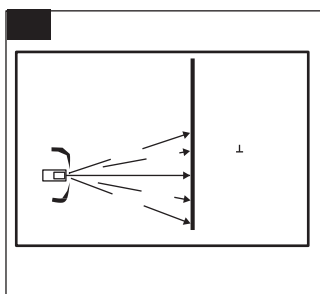
- Press the Measure key $\left(\frac{A}{m}\right)$ again to display the calculated length of BC in the lowest row of the screen; the distance AC will be displayed at the same time in the second row (Fig.6).



NOTES:

- The distance AC must be shorter than the hypotenuse (AB); otherwise the LCD will display "Err008" reminding you to re-measure the distance AC.
- When taking the two measurements, make sure that they are taken from the same starting point (A) and that AC is perpendicular to BC. Taking the measurements correctly will help result in the most accurate calculated distance.

Minimum measurement mode will be helpful to keep AC and BC form a right angle(90°) (Fig.7).



DOUBLE PYTHAGOREAN THEOREM MEASUREMENT(SAME

DIRECTION)

Use the double Pythagorean

measurement mode when both ends of the length to be measured indirectly are higher than the measurement position.

In the illustrated example (Fig. 8), the length BC is unknown distance to be determined. For this purpose, AB and AC must be measured. The lines labeled AO and BC must form a right angle(90°).

choose double Pythagorean

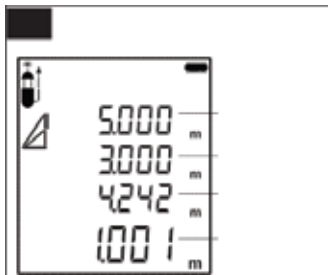
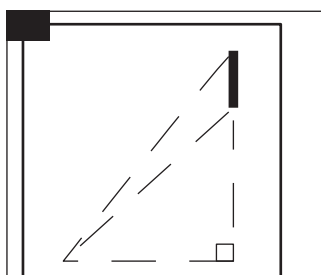
(same direction). The mode icon will blink on the LCD.

- Press the measure key $\left(\frac{A}{m}\right)$ to turn on the laser beam at A. Position the tool to aim the laser at the target B.
- Press the measure key $\left(\frac{A}{m}\right)$ to display the measured length of AB
- Without changing measuring reference point location of the tool in position A, aim the laser dot perpendicularly at the target O.
- Press the measure key $\left(\frac{A}{m}\right)$ to display the measured length of AO in the second row of the screen.
- Without changing the measuring reference point location of the tool in position A, aim the laser dot at the target C.
- Press the measure key $\left(\frac{A}{m}\right)$ again to display the indirect length of BC in the lowest row of the screen; the distance AC will be displayed at the same time in the third row (Fig.9).

NOTES:

Make sure AB and AC have the same starting point(A) and the AO is perpendicular to BC.

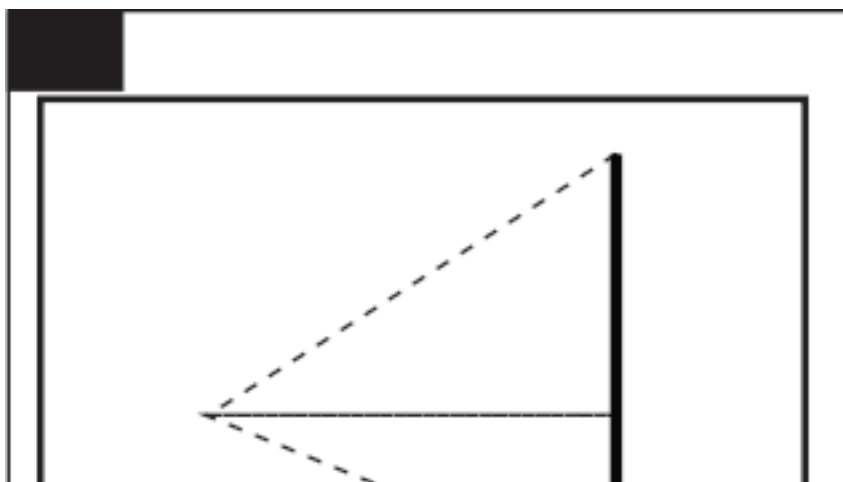
Minimum measurement mode will be helpful to keep AO and BC form a right angle(90°) (Fig.7).

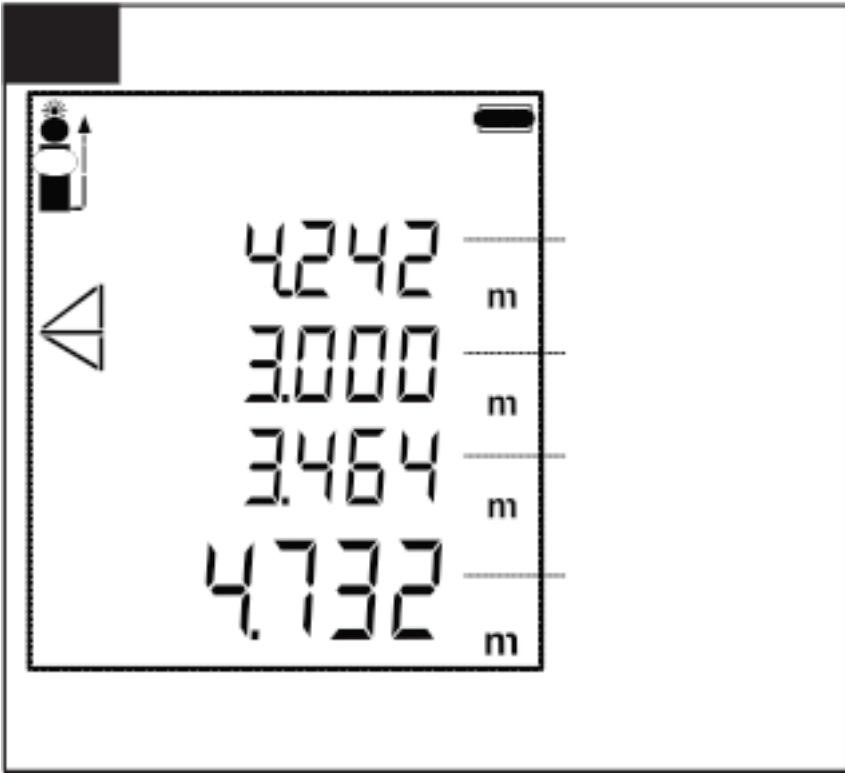
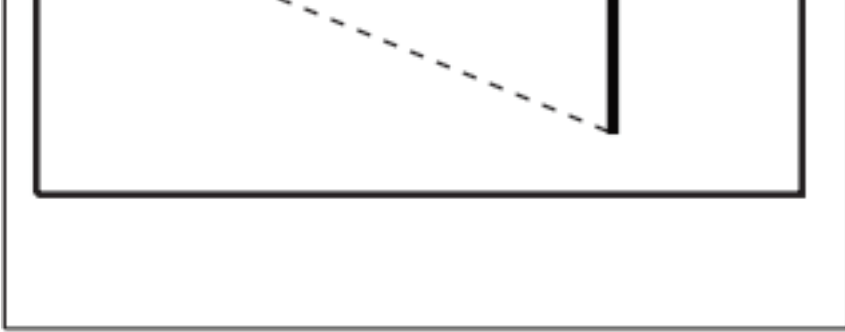


DOUBLE PYTHAGOREAN
THEOREM
MEASUREMENT(OPPOSITE
DIRECTION)

Use the double Pythagorean measurement mode when one end of the length to be measured indirectly is higher than the measurement position and the other end of that length is lower than the measurement position. In the illustrated example (Fig. 10), the length BC is to be determined, and A is the measurement position. For this purpose, AB, AO and AC must be measured. AO and BC must form right angles(90°).

1. Press the function key to choose double Pythagorean Theorem measurement mode (opposite direction). The mode icon will blink on the LCD.
2. Press the measure key to turn on the laser beam at A. Position the tool to aim the laser at the target B.
3. Press the measure key to display the measured length of AB in the first row of the screen.
4. Without changing measuring reference point location of the tool in position A, aim the laser dot perpendicularly at the target O.
5. Press the measure key to display the measured length of AO in the second row of the screen.
6. Without changing the measuring reference point location of the tool in position A, aim the laser dot at the target C.
7. Press the measure key again to display the indirect length of BC in the lowest row of the screen; the distance AC will be displayed at the same time in the third row (Fig.11).





NOTES:

Make sure AB and AC have the same starting point(A) and the AO is perpendicular to BC.

Minimum measurement mode will

be helpful to keep AO and BC form a right angle(90°)(Fig.7).

MASS AREAS MEASUREMENT

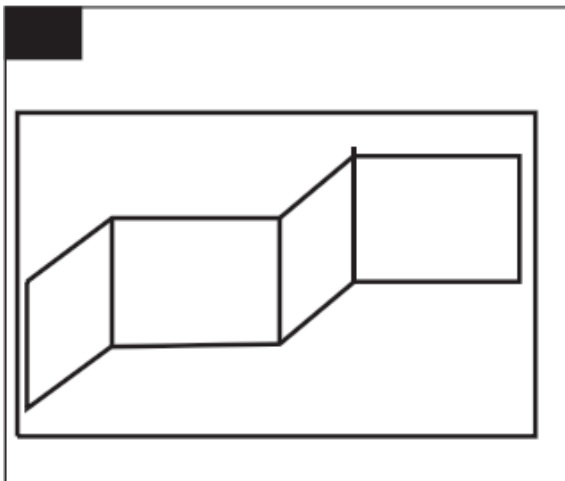
This feature is used in the measurement of mass areas. Notes:

All of the areas must have a same length side!

The sum of the areas signed S1,






S2, S3 and S4 is to be determined

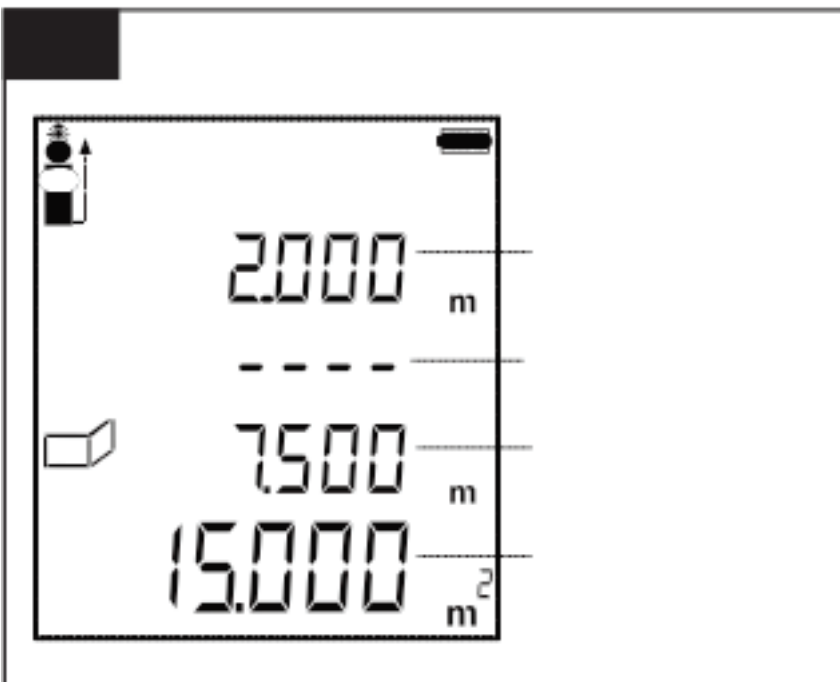
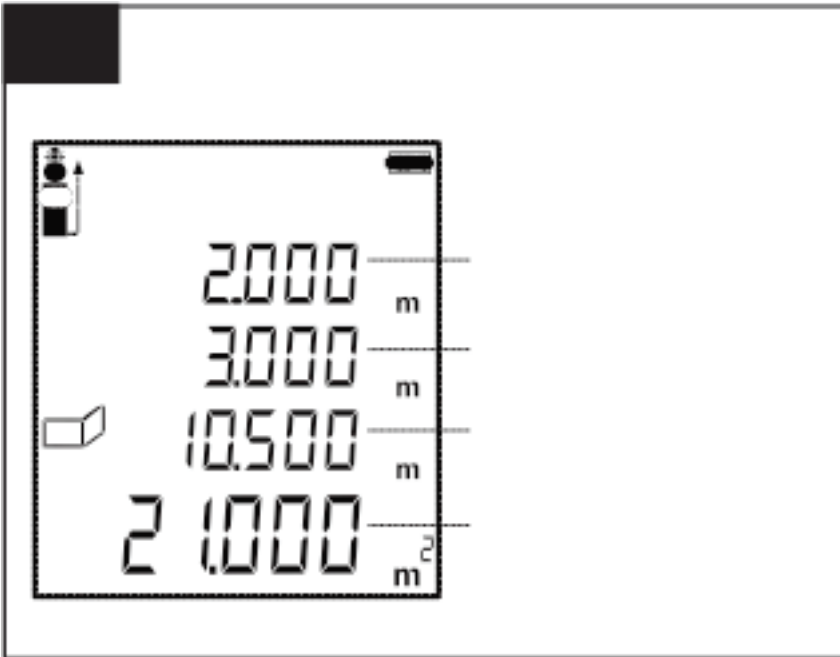
(Fig.12). They have a same side "H". Using this function, the sum of the areas can be determined fast and easily.

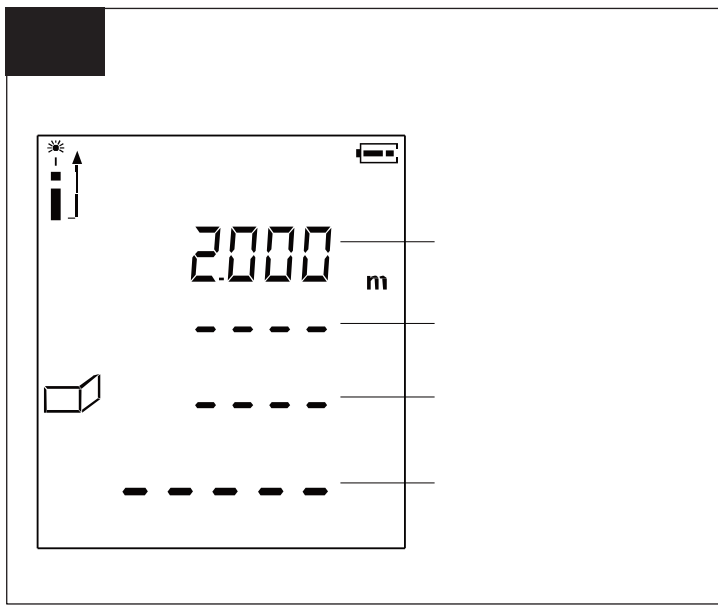


1. Press the function key  to choose mass areas measurement mode. The mode icon  will blink on the LCD



1. Press the function key  to choose mass areas measurement mode. The mode icon  will blink on the LCD.
2. Measure the same length side(H), which will blink on the first row of the screen.
3. Measure the other sides of the areas.
4. The real time length of side will blink on the second row of the screen, the sum of the length and the sum of the areas will blink on the third and the lowest row of the screen (Fig. 13).
5. Press the clear key  to clear the current length, then the last time sum of length and areas will blink on the screen (Fig.14). Press the clear key  again to clear all of the sum date and only the length of "H" will stay on the screen (Fig.15). Press the clear key  to clear H and go back to the original step in this function mode.





MINIMUM/MAXIMUM MEASUREMENT

This function allows the user to measure the minimum or maximum distance measured from a fixed measuring point. It is commonly used to measure diagonal distances (maximum values), horizontal distances, or vertical distance (minimum values) (Fig.7).

The resulting value can be transferred to area, volume, Pythagorean Theorem measurement, mess area and single-distance measurement modes.

Min/Max function can help eliminate the measuring deviation caused by holding the tool incorrectly when aiming at the target. It can help to get an accurate calculation of area, volume and indirect length.

1. Press the function key to choose area, volume or Pythagorean Theorem measurement mode.
2. Press the Min/Max key to activate the Min/Max function. Continuously pressing to switch between the two functions. The mode icon "max" or "min" will blink on the LCD.
3. Press the measure key to turn on the laser, aim the laser beam at the target you want to measure and press it again to start the minimum or maximum measuring.
4. Slowly sweep the laser left and right or up and down over the desired target point.
5. Press any key to interrupt the Min/Max measuring; the minimum or maximum value will be displayed on the related row of the screen as an accurate length for calculation.

SAVE AND RECALL MEASUREMENT

This laser distance meter can save 20 measurements or calculations, as described below. If more than 20 measurements are saved, the new data will cover the oldest previously saved data.

This laser distance meter can save 20 measurements or calculations, as described below. If more than 20 measurements are saved, the new data will cover the oldest previously saved data.

Save: When the measurement is completed, the value will display in the screen. Make sure the value is correct, then Press the key and hold it for about 3 seconds; the value will be saved in the memory.

Recall: press the key to enter recall mode, press it again to exit from the recall mode.

In recall mode, press the key or to scroll upwards. Press the key to erase the current record.

ADDITION AND SUBTRACTION

ADDITION AND SUBTRACTION

The single-distance, area, volume and indirect length can be added or subtracted with the addition and subtraction functions.

1. Take the first measurement.
2. Press the key \oplus or \ominus to choose addition or subtraction. The mode icon “ \oplus ” or “ \ominus ” will blink on the LCD.
3. Take the second measurement.
4. The sum or difference between the measurements will be displayed in the lowest row of the screen, and the last measurements will be displayed at the same time in the upper row of the screen.
5. Follow the same method to make additional calculations.

DELAY MEASUREMENT

Use the timer to trigger the tool auto-measuring after a certain time delay (5s to 60s). It can help reduce the measuring error by frequent pressing, especially for long distance measurement.

To activate the timer, turn on the laser. Press the key ⏸ to set a 5-second time delay or press it repeatedly until the desired time delay is reached

(max. 60 seconds). Once the button is released the remaining seconds are displayed in a countdown. Every second will be counted down with a beep.

The timer can be used for all measurements.

WORKING WITH THE TRIPOD (NOT INCLUDED)

The use of a tripod is particularly helpful for greater distances. The measuring tool can be screwed onto a commercially available tripod using the 1/4" thread on the bottom side of the housing.

Notes:

Make sure the measurement reference point is taken from the position of the tripod screw.

1. Mount the tool to the tripod.
2. Press the key ⏸ to set the measuring reference to the thread. The mode icon ⏸ will blink on the LCD.
3. Start to take measurement.

ERROR SIGNALS

The following error signals may appear on the screen of your tool during measuring:

Code	Cause	Solution
Err001	The reflected laser light is too intense	Do not direct the laser at a highly reflective surface; cover the surface with white paper if necessary
Err002	Out of range. The measuring range for this tool is from 0.15 to 60m	Take measurement within the range of 0.15 to 60m
Err003	The target provides poor reflection of the laser	Change the measuring target, use the target plate, or cover the target with a piece of white paper
Err004	The temperature is too high	Wait until the measuring tool has reached the operating temperature (0 to 40°C)
Err005	The temperature is too low	Wait until the measuring tool has reached the operating temperature (0 to 40°C)
Err006	Low battery, a reminder to charge the battery	Charge the battery
Err007	Strong vibration or the tool was moved quickly when measuring	Always keep the tool and target steady
Err008	Wrong input, the length of one side of the right triangle as measured is longer than the hypotenuse	Re-measure; the hypotenuse is always longer than the first side length in a right angle