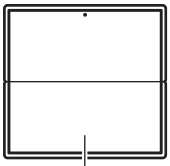
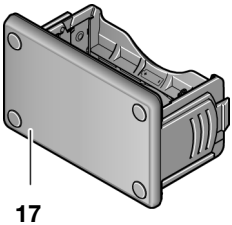
28

0635-1490



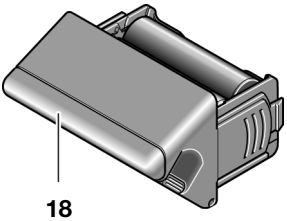
29

0635-3120



17

0600-1320



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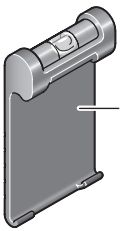

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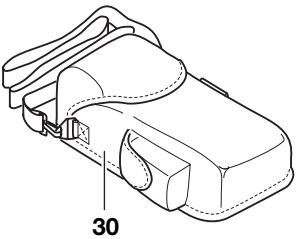

30

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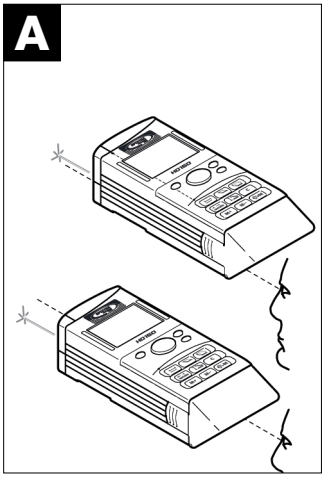
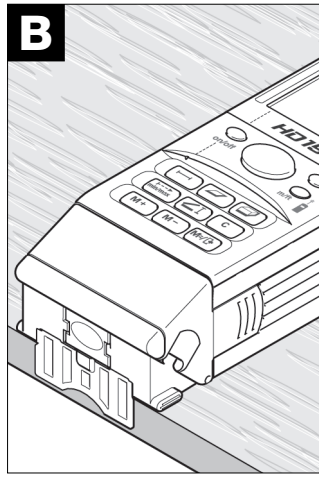
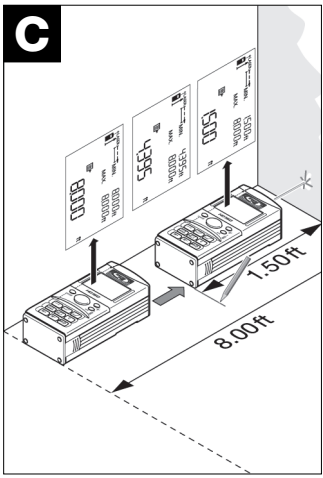
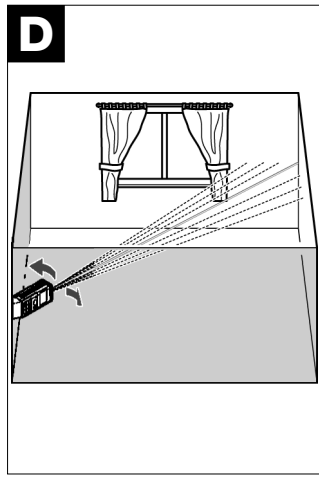
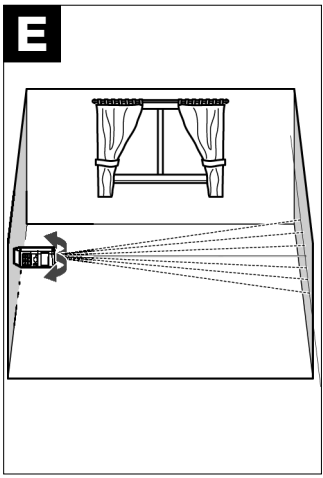
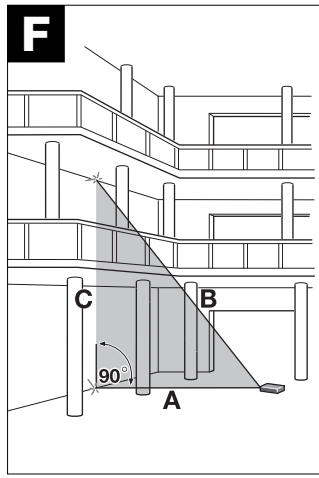

A

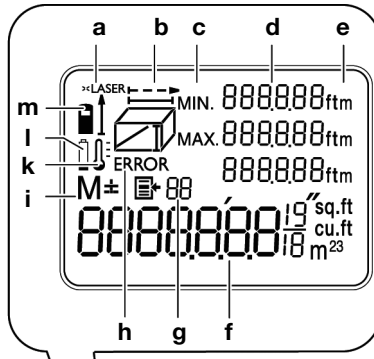

B

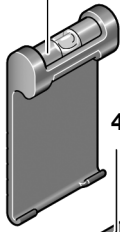

C
1.50ft
8.00ft


D

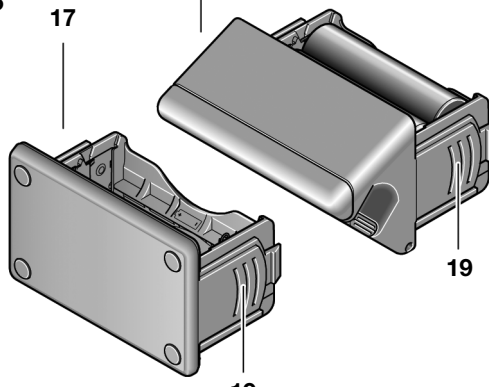

E

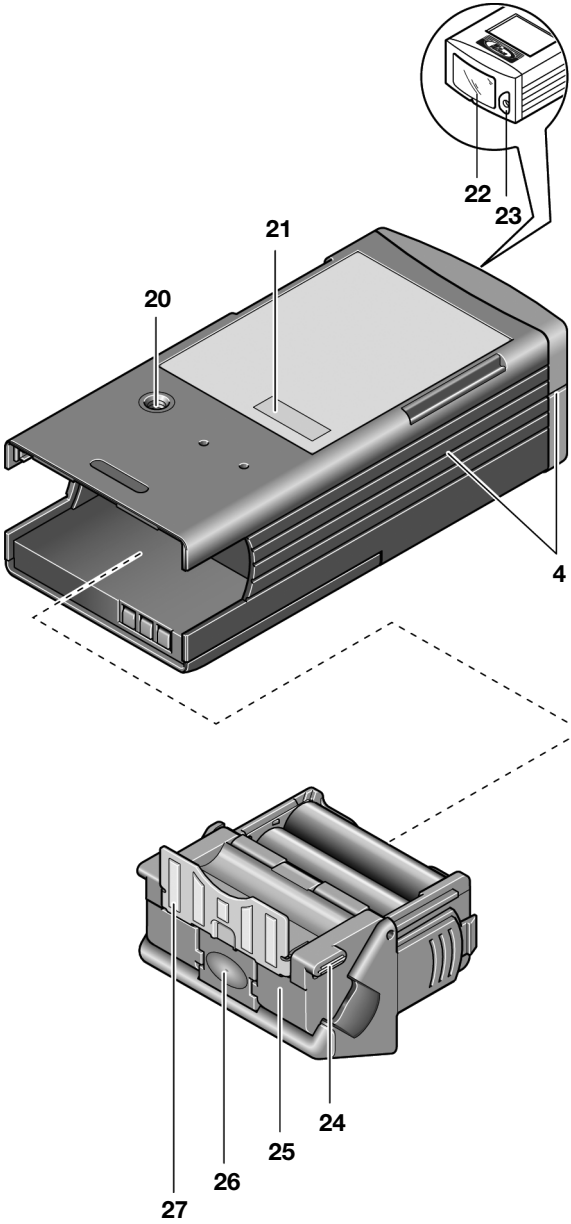

F
C
B
90°
A


a
b
c
d
e
m
l
k
i
LASER
MIN.
MAX.
ERROR
M±
ftm
sq.ft
cu.ft
m²³
h
g
f


3

4
5
6
7
8
2
1
HD150
M+
M-
M/Pt
C
9
10
11
12
13
14
15
16


18
17
19
19


22
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27

Product Specifications

Digital Laser Distance Measuring Instrument

Order number	HD 150
Measuring range (natural surfaces)	0.3 ... 150 m (1 ... 500 ft)*
Measuring accuracy Typical (0.3 ... 30 m/1...100 ft) Maximum	 ±2 mm (±3/32 in) ±3 mm (±1/8 in)**
Measuring time Typical Maximum	 <0.5 s 4 s
Smallest display unit	1 mm; 1/16 in; 0.005 ft
Operating temperature	–10 °C ... +50 °C (+14 °F ... +122 °F)
Storage temperature	–20 °C ... +70 °C (–4 °F ... +158 °F)
Laser type	635 nm, <1 mW
Laser class	2
Diameter of the laser beam (at 25 °C/77 °F) approx. at a distance of 10 m (33 ft) at a distance of 50 m (164 ft) at a distance of 100 m (328 ft) at a distance of 150 m (492 ft)	 6 mm (1/4 in) 30 mm (1.2 in) 60 mm (2.4 in) 90 mm (3.5 in)
Batteries Rechargeable batteries	4 x 1.5 V LR6 (AA) 4 x 1.2 V KR6 (AA)
Battery service life approx.	30000 single measurements
Automatic switch-off Laser Instrument (without measurement)	 20 s 5 min
Weight (with batteries) approx.	430 g (15.2 oz)
Protection class	IP 54 (dust and splash water protection)

* The better the laser light is scattered (not reflected) back from the surface of the target object and the brighter the laser point is in relation to the brightness of the surroundings (interiors, twilight), the longer the range will be.
Under unfavorable conditions (e.g., measurement outdoors with strong sunlight), it can be necessary to use a target panel.

** +0.1 mm/m (+1/32 in per 26 ft) for unfavorable conditions such as, for example, strong sunlight and distances over 30 m (100 ft)

The serial number **21** for positive identification of your unit is located on the nameplate on the underside of the case.

Symbols

Symbol	Name	Meaning
mm	Millimeter	Length
m	Meter	Length
m^2	Square meter	Area
m^3	Cubic meter	Volume
in	Inch	Length
ft	Foot	Length
sq.ft	Square feet	Area
cu.ft	Cubic feet	Volume
s	Seconds	Time
min	Minutes	Time
°F	Degrees Fahrenheit	Temperature
°C	Degrees Celsius	Temperature
nm	Nanometer	Wave length
mW	Milliwatt	Power
V	Volts	Voltage
g	Gram	Mass
oz	Ounce	Mass
°	Degree	Angle
EN	European standard	
IP	Protection class	

Intended Use

The unit is intended for measuring distances, lengths, heights, spacings and to calculate areas and volumes. The unit is suitable for measuring in interior and exterior construction.

Product Elements

Please open the fold-out page with the illustration of the unit and leave it open while you read these operating instructions.

1 Continuous measurement button/ minimum-maximum measurement min/max

2 Length measurement button

3 Bubble level*

4 Aligning aid

5 Area measurement button

6 **“on/off”** button

7 Measurement button (Two-step button for sighting and measuring)

8 Display

9 Display lighting button

10 Button for changing the **"m/ft"** measuring unit and the continuous pointer mode

11 Volume measurement button

12 Clear button C

13 Indirect length measurement button

14 Button for reading memory M=/

15 Memory subtraction button M–

16 Memory addition button M+

17 Compact end piece*

18 Universal end piece*

19 End piece latching

20 1/4" threads

21 Serial number

22 Receiving lens

23 Laser beam exit

24 Grip

25 Flap

26 Flap unlocking button

27 Positioning extension

28 Laser viewing glasses**

29 Target panel**

30 Protective bag*

*** Accessory parts (included)**
**** Optional accessories (not included)**

Display Elements

a Laser switched on

b Measurement functions

- Continuous/minimum-maximum measuring
- Length measurement
- Area measurement
- Volume measurement
- Indirect length measurement

c Minimum/maximum value

d Individual measured values (except for length measuring function)

e Units of measure: ft/in/sq.ft/cu.ft, $m/m^2/m^3$

f Measured value/results

g Display of previous measurement results

h Error indication

i Store/addition/subtraction of measured values

k Temperature indicator

l Battery indicator

m Measuring from the back end

For Your Safety

Working safely with this unit is possible only when the operating and safety information are read completely and the instructions contained therein are strictly followed.

Laser radiation of laser class 2
630–675 nm, <1 mW, according to EN 60825-1:2001

The instrument complies with 21CFR, Parts 1040.10 and 1040.11.

⚠ WARNING

Do not look into the laser beam.

Do not point the laser beam at persons or animals.

Because of the narrow concentration of the laser beam, care will be needed when tracking the beam for long distances.

- The laser viewing glasses (accessory) are not protective glasses against laser radiation. Do not use them as protective glasses against strong sun light or in traffic.
- Children may use the unit only under the supervision of adults.
- Do not remove the warning sign from the unit.
- Have repairs carried out only by a Trimble Service Center. Never open the unit yourself.
- Trimble is able to ensure perfect functioning of the unit only if the original accessories intended for it are used.

Protection of the Unit

- Protect the unit from moisture and direct sunrays.
- Dirt in the end piece can lead to corrosion or breaks in contact. Always keep the end piece clean.
- If the unit is not used for a long period, the batteries must be removed (danger of corrosion).
- Transport and store the unit in the protective bag **30**.

Inserting/Replacing the Batteries

Use alkali-manganese or rechargeable batteries exclusively.

Rechargeable 1.2 V batteries reduce the number of possible measurements.

Press the latches **19** on both sides of the end piece and remove the end piece **17** or **18**.

Insert the batteries provided. When inserting the batteries, pay attention to the correct polarization. Reinsert the end piece **17** or **18**.

When the battery symbol appears, at least 100 measurements are still possible.

When the battery symbol blinks, the batteries must be replaced. Measurements are no longer possible.

Always replace the complete set of battery.

Putting into Operation

Switching On/Off

Switching on:
Press the **"on/off"** button **6** or the measurement button **7** completely down.

Switching off:
Press the **"on/off"** button **6**.

After approx. 5 min without performing a measurement, the unit switches off automatically to save the batteries.

With the automatic switch-off, the current display and the settings of the unit are also stored in addition to the already stored measured values. When switched on again, the unit is in the same function and shows the same display as before the automatic switch-off.

Changing the Measuring Unit

After switching on the measuring instrument, the measured values are shown in the unit that was selected the last time the measuring instrument was used.

With repeated pressing of the "**m/ft**" button **10**, switching between the units of measure shown here can be made at any time, also for already calculated values.

Exception: If the continuous laser beam is switched on (see *Continuous Pointer Mode)*, the measuring unit cannot be changed.

For areas or volume entries, only units of m or ft are possible.

Measuring Procedure

The instrument has several measuring functions that can be selected by pressing the respective function button (see *Measurement Functions* Section). After switching on, the instrument is in the "Length Measuring" function.

To change the measuring function, press the button for the desired function. After selecting the measuring function, all further steps take place by pressing the measure button **7**.

Place the rear end of the unit (end piece) at the desired measuring position (e. g. on a wall). The rear end of the unit is the reference point for the measurement.

– To switch on the laser beam, lightly press the measurement button **7** in the middle or press at the side.
– Aim at the target.

■ **Do not point the laser beam at persons or animals.**

– To measure, press the measure button **7** completely down.

The measured value appears after 0.5 to 4 s. The end of the measurement is indicated by an acoustical signal. The duration of the measurement is dependent on the distance, light conditions and reflection characteristics of the measured surface. After completion of the measuring procedure, the laser switches off automatically.

Continuous Pointer Mode

As required, the unit can be switched to continuous laser beam (continuous pointer mode). For this purpose, press the measurement button **7** lightly in the middle or the side to switch on the laser beam. Then press the continuous pointer mode button **10**. In this mode, the laser beam also remains switched on between measurements. For measuring, only a single pressing down completely of the measurement button **7** is necessary.

- **Do not look into the laser beam.**
- **Do not point the laser beam at persons or animals.**

When the continuous laser beam is switched on, the measuring unit of the displayed measured values cannot be changed.

To switch off the continuous laser beam, press the continuous pointer mode button **10** or switch off the unit. After renewed switching on, the unit is again in the normal mode (the laser beam is switched on only when the measurement button **7** is pressed).

Working Instructions

The instrument measures from the back end of the case.

– The receiving lens and the outlet of the laser beam should not be covered during a measurement.
– Do not move the instrument during a measurement (Exception: Continuous measurement function including minimum/maximum measurement). If possible, rest the instrument on or against the measuring point.
– The measurement takes place at the middle point of the light spot, also for obliquely illuminated target surfaces.
– The measuring range depends on the light conditions and the reflection characteristics of the measured surface. For outdoors work and with strong sunlight, use the laser viewing glasses **28** or the target panel **29** (accessories) for better visibility of the laser spot or shade the target area.
– When measuring to transparent surfaces (e.g. glass, water) or reflecting surfaces, erroneous measurement can result. Porous or structured surfaces, air strata with different temperatures or indirectly received reflections can also influence the measured value. These effects are caused by physical properties and can therefore not be excluded by the measuring instrument.
– In the dark, press the display lighting button **9**. The display is then lit. To switch off the lighting, press the button **9** again.
– By means of the upper and side aligning aids **4**, aiming over longer distances is facilitated. For this purpose, sight along the upper or side aligning aids. The laser beam runs parallel to these lines of sight (see Fig. **A**).
– When the unit is switched off, all values stored in memory are retained. However, when the end piece is removed (changing of the end piece or the batteries), the memory contents are lost.

Changing the End Piece

The unit is provided with two different end pieces.

The compact end piece **17** reduces the dimensions of the unit. It is suitable for measurements for which the rear end of the unit can rest on a flat surface.

The universal end piece **18** is suitable for measurements from corners, e.g. to determine the diagonals of a room.

– With the aid of the positioning extension **27** on the universal end piece **18**, the unit can be placed on an edge (see Fig. **B**). For this purpose, pull up the flap **25** with the grips **24** and fold out the positioning extension **27**.
– If the rear end of the unit is to be placed on a flat surface, fold in the positioning extension **27**.
– For measuring from corners, fold in the positioning extension **27**, press the unlocking button **26** and allow the flap **25** to relatch.

To change the end piece, press the latches **19** on both sides and remove the end piece. Insert the new end piece.

The unit takes automatically into consideration the different lengths of the end pieces when measuring (measurement in both cases from the rear end of the unit).

Bubble Level

The bubble level makes possible the easy horizontal alignment of the unit.

The bubble level **3** can be attached on the right or left of the display **8** on the housing. Attach the bubble level with the lower end of the holder first.

Measurements with a Tripod

Measurements with a tripod are especially necessary for long distances. The unit can be screwed onto a camera tripod with the 1/4" threads **20** on the underside of the housing.

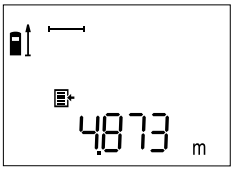
☞ **Also with the use of a tripod, the unit measures from its rear end and not from the middle of the threads.**

By means of transit measurement, distances of up to 300 m/984 ft (two times 150 m/492 ft) can also be measured.

Measurement Functions

Length Measurements

Press the length measuring button ⟼ **2** to switch to the mode for length measurements. The symbol for length measurements appears in the upper part of the display.

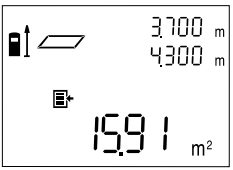


To measure, press the measure button **7** completely down.

The measured value is shown at the bottom of the display.

Area Measurement

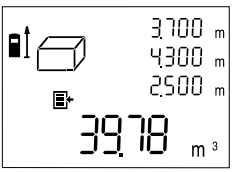
Press the area measuring button ▱ **5** to switch to the mode for area measuring. The symbol for area measurements appears in the upper part of the display.



Then measure the length and width one after the other as for a length measurement. After completing the second measurement, the result is automatically calculated and displayed. The individual measured values are shown in the upper right of the display, the results at the bottom.

Volume Measurement

Press the volume measuring button **11** to switch to the mode for volume measurement. The symbol for volume measurement appears in the upper part of the display.



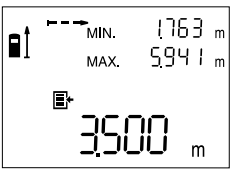
Then measure the length, width and height one after the other as for a length measurement. After completion of the third measurement, the result is automatically calculated and displayed.
The individual measured values are shown in the upper right of the display, the results at the bottom.

Note: Values of more than 9999999 cu.ft cannot be displayed. For larger values, switch to the "m^3" unit of measure by pressing the **"m/ft"** button **10**.

Continuous Measurement (see Fig. C)

The continuous measurement serves for the transfer of dimensions, for example, from construction plans. With continuous measuring, the instrument can be moved relative to the target with the measured value being updated approximately every 0.5 s. For example, the user can move back from a wall until he reaches the desired distance with the actual distance always being readable.

To set the unit to the continuous measurement mode, press the min/max button **1**. The symbol ⊢--- appears in the display.



To initiate the measurement process, press the measurement button **7** completely down. Move the measuring instrument until the desired distance value is shown at the bottom of the display.

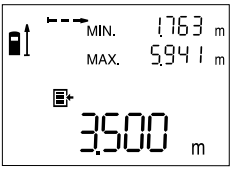
By pressing the measure button **7**, the continuous measuring is interrupted. The current measured value is shown in the display. Again pressing the measure button **7** starts the continuous measuring anew.

The continuous measuring switches off automatically after 10 min. The last measured value remains in the display.
For earlier ending of the continuous measuring, change the measuring function with one of the function buttons.

Minimum-Maximum Measurement (see Fig. D + E)

The minimum/maximum measurement serves to determine the minimum or maximum distance from a fixed reference point. It is an aid, for example, for the determination of diagonals (maximum value) as well as verticals and horizontals (minimum value).

To switch to the minimum/maximum measuring mode, press the min/max button **1**. The symbol ⊢--- appears in the display.



To initiate the measurement process, press the measurement button **7** completely down. Move the laser point back and forth over the desired target point (e.g., the corner of a room) so that the rear end of the unit as the reference point for the measurement remains at the same position.

At the upper right in the display, the minimum and maximum are shown.

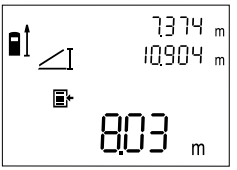
By pressing the measurement button **7**, the minimum/maximum measurement is interrupted. The current measured values are shown in the display. Renewed pressing of the measurement button **7** starts the minimum/maximum measurement anew.

Indirect Length Measurement (see Fig. F)

The indirect length measuring function serves for measuring distances that cannot be measured directly because an obstacle would obstruct the laser beam or no target surface is available as a reflector. The best possible results are achieved only when the laser beam and the measured distance form an exact right angle (Pythagorean theorem).

In the illustrated example, the length **"C"** is to be determined. For this purpose, **"A"** and **"B"** must be measured.

Press the indirect length measurement button ∠I **13** to switch to the mode for indirect length measuring. The symbol for indirect measuring ∠I appears in the display.

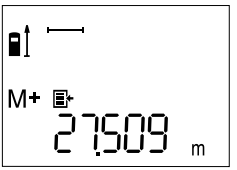


As for a length measurement, measure the distance **"A"**. Take care that a right angle exists between the laser beam and the distance **"C"**. Then measure distance **"B"**.

During the measurements, the rear end of the unit as the reference point must remain at the same position.

After completing the second measurement, the length **"C"** is automatically calculated and indicated at the bottom of the display. The individual values are shown at the upper right.

Storing/Adding of Measured Values



By pressing the M+ button **16**, the value at the bottom of the display – either a length, area or volume value depending on the current measuring function – is stored in memory. In the display, **"M+"** appears briefly and then **"M"**.

If a value is already present in the memory, the new value is added to the memory contents, however, only when the units of the measurements are in agreement.

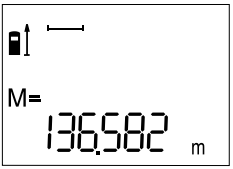
For example, if an area value is stored in the memory and the current measurement is a volume value, the addition cannot be performed. In the display, the "ERROR" message blinks briefly.

Subtraction from Measured Values

By pressing the M– button **15**, the value at the bottom of the display is deducted from the value stored. In the display, **"M–"** appears briefly and then **"M"**.

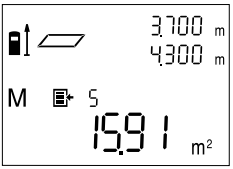
If a value is already present in the memory, the new value is subtracted from the memory contents, however, only when the units of measurement are in agreement (see *Storing/Adding of Measured Values*).

Display of the Stored Value/ Display of the Last 20 Measurement Results



By pressing the button for memory recall M=/⎘ **14**, the value stored in the memory is displayed. In the display, the memory symbol **"M="** appears.

When the memory content **"M="** is shown in the display, it can be doubled by pressing the M+ button **16** or set to zero by pressing the M– button **15**.

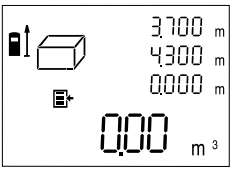


In addition, the unit stores automatically the results of the last 20 measurements. By repeated pressing of the button for memory recall M=/⎘ **14**, the measurement results are displayed in reverse order (the last measured value first). In the display, the symbol 📝 appears. The counter at the right next to the 📝 symbol shows the numbering of the displayed values.

The measured values displayed can still be entered into memory by pressing the M+ button **16** or the M– button **15**.

Clearing the Measured Value/Memory

By pressing the clear C button **12**, correction of the last determined individual measured values in the area, volume, continuous/minimum/maximum and indirect length measuring functions is possible.



By repeated pressing of the clear button C, several individual measured values are cleared one after the other in the reverse order of the measurement.

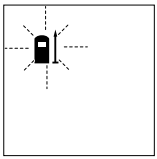
By pressing the clear button C in the minimum/maximum measuring function, the minimum and maximum measured values are cleared simultaneously.

To clear the memory contents, first press the M=/⎘ button **14** for memory recall until **"M="** appears in the display. Then press the clear C button **12**; the **"M"** no longer appears in the display.

The list of the last 20 measurement results can be cleared when first the M=/⎘ button **14** for memory recall is pressed until the 📝 symbol and the counter of the measurements appear. Then press the clear C button **12**; in the display, 📝 no longer appears.

Error – Cause and Correction

Cause	Correction
The temperature indicator k blinks, measuring is not possible	
Measurement outside the allowed temperature range from –10 °C (+14 °F) to +50 °C (+122 °F).	Wait until the allowable temperature range is reached.
“ERROR” Message and “------- m” in the Display	
The angle between the laser beam and the target is too acute.	Increase the angle between the laser beam and the target.
The target surface reflects too strongly (e.g. a mirror) or too weakly (e.g. black material).	Use the target panel (accessory).
Ambient light is too strong (e.g. sunlight).	Use the target panel (accessory).
The receiving lens **22** or the laser beam exit **23** are misted over, for example, as a result of changing between low and high environmental temperatures.	Wipe the receiving lens **22** or the laser beam exit **23** dry with a soft cloth.
Unreliable Measurement Results	
The target surface does not reflect clearly (e.g. water, glass).	Cover the target surface.
The laser beam exit **23** or the receiving lens **22** is soiled.	Keep the laser beam exit **23** or the receiving lens **22** free of dirt.
The corrective measures listed above do not eliminate the error.	Take the unit to your dealer for sending to the Trimble Service Center.



The instrument monitors the correct functioning for every measurement. If a defect is detected, only the symbol blinks in the display (measurement from the back end). Take the unit to your dealer for sending to the Trimble Service Center.

Checking the Measurement Accuracy

The accuracy of the instrument can be checked as follows:

– Select a distance that never changes that is approx. 1–10 m (3.3–33 ft) long (e.g. room width, door opening) whose length is known exactly.
– Measure this distance ten times one after the other.

The measurement error can be a maximum of ±3 mm (±1/8 in). Record the measurements so that the accuracy can be compared at a later time.

Maintenance

Do not immerse the unit in water.

Wipe off dirt with a damp, soft cloth. Do not use aggressive cleaning agents or solvents.

Take care of the unit, especially the receiving lens **22**, by handling it in the same manner as for eye glasses or a camera.

If the unit should fail despite the care taken in manufacture and testing, the repair should be performed by an authorized Trimble Service Center.

In case of repair, send in the unit in the protective bag **30**.

Environmental Protection

Recycle raw materials instead of disposing as waste.

The unit, accessories and packaging should be sorted for environment-friendly recycling.

These instructions are printed on recycled paper manufactured without chlorine.

The plastic components are labeled for categorized recycling.

Do not throw used batteries into household waste, fire or water, but rather – according to the applicable legal regulations – dispose of in an environmentally friendly manner.

Specifications subject to change without notice.