Operating manual

Laser distance meter
Model: COSMO 120 Video

Congratulations on the purchase of laser distance meter ADA COSMO 120 Video!

Permitted use
· Measuring distances
· Computing functions, e.g. areas, volumes, subtractions, trapezoid, Pythagorean calculation, measurements with the tilt sensor.

The safety regulations and instructions along with the operating manual should be read carefully before initial operation.The person responsible for the instrument must ensure that equipment is used in accordance with the instructions. This person is also accountable for the deployment of personnel and for their training and for the safety of the equipment when in use.

SAFETY INSTRUCTION

Prohibited use

Please follow up instructions given in operating manual.

Do not use instrument in explosive environment (filling station, gas equipment, chemical production and so on).

Do not remove warning labels or safety instructions.

Do not open instrument housing, do not change it's construction or modification.

Do not stare at beam. Laser beam can lead to eye injury (even from greater distances).

Do not aim laser beam at persons or animals.

Opening of the equipment by using tools (screwdrivers, etc.), as far as not specifically permitted for certain cases.

Inadequate safety precautions at the surveying site (e.g. when measuring on the roads, construction sites and so on).

Use the instrument in the places where it could be dangerous: on the air transport, near manufacturers, production facilities, in the places where the work of laser distance meter can lead to the harmful effects on people or animals.

START UP

Keypad

1. ON/Measuring
2. Digital Camera Button
3. Addition
4. Area/Volume
5. Reference/Time
6. Angle/Stake out function
7. Clear/OFF
8. Indirect measurements
9. Substraction
10. Trapezoid
11. Menu/Equal Button
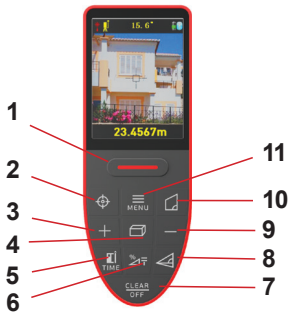
Display

The graphics screen of the measurement window is split into different areas. The selected measuring function is shown at the left top part. The measurement field contains the previous measurement results. There are 5 rows on the display.

1. Current measurement function
2. Indicator of laser point
3. Indicator of selected reference point
4. Digital level
5. Indicator of Bluetooth
6. Battery power
7. Previous measurement
8. Result of previous measurement
9. Current measurement function and result
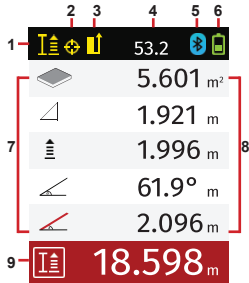
1. Current measurement function
2. Results of successive measurements
3. Additional calculations
4. Main result

1 — 53.2

2:
5.601 m²
1.921 m
1.996 m

3:
61.9°
2.096 m

4 — 4.797 m

Display in Digital Camera mode (2x zoom)

Built-in digital camera shows the target directly on the display.
The instrument takes measurements with the help of crosshairs, even if the laser dot is not visible (in bright illumination).
2x magnification. When the digital camera is used for close targets (<10m) the laser dot may not coincide with the image in the center of the display. In this case you should rely on the actual laser dot for targeting the object.

Inserting / Replacing Batteries
Remove the battery compartment lid.
Insert new batteries. Pay attention to the polarity.
Close the battery compartment.

53.2

23.4567 m
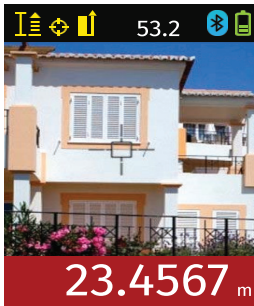
The batteries should be replaced, when the battery voltage is too low.
Batteries should be removed if the device will not be used for a long time (danger of corrosion).

Use of rechargeable batteries
Remove the battery compartment lid. Replace it with the rechargeable batteries that are built into the battery cover (is supplied with the tool). If the battery is low, charge it by the connection of the power cable. Power connector is placed under the rubber cap on the battery cover with the rechargeable batteries. For charging use the device with the following output data: 5V 0.5A.

**NOTE! Do not leave the device unattended when charging the battery.**

End-piece
Fold out the end-piece (180°) to measure from the edge of the end-piece. Press button (5) to choose the edge of the end-piece as a reference point. The selected measurement reference point is displayed on the

LCD display.
Push the end-piece by 90° to measure from the corner or the edge of the object. T

ADJUSTMENT FUNCTIONS

1. Current measurement (distance)
2. Brightness of the display
3. Offset of reference point
4. Digital level
5. Sound alarm
6. Unit of measurement (corner)
7. Continious laser
8. Factory reset
9. Bluetooth
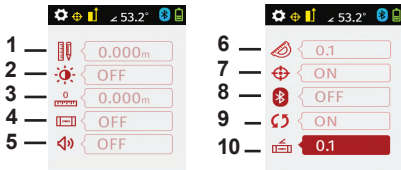
10. Calibration of tilt sensor

Press and hold button MENU to enter into the menu. Press buttons + or − to change the settings of submenu. Press and hold menu button to confirm settings.
Press button CLEAR OFF to exit from the menu without saving.

Setting the unit for distance measurements
Select in the menu article 1. MEASUREMENT UNIT (DISTANCE) to change the measurement units.
Change units by pressing buttons + or − .

0.000 m	0.000 m^2	0.000 m^3
0.00 m	0.000 m^2	0.000 m^3
0.00 ft	0.00 ft^2	0.00 ft^3

0'00" $^1/_{32}$	0.00 ft^2	0.00 ft^3
0.0 in	0.00 ft^2	0.00 ft^3
0 $^1/_{32}$ in	0.00 ft^2	0.00 ft^3

Setting the unit for tilt measurements
Select in the menu article 2. MEASUREMENT UNIT (CORNER) to change the measurement units. Change units by pressing buttons ➕ or ➖.

$\pm$ 0.0 °
0.0%

Level
The Level (in °) in status field can be switched on or off.

Continuous laser
You can switch the continuous laser on or off. (Laser doesn't switch off after taking a measurement).
When the laser is switched off, press button — to switch laser on. Press button — for the
second time to take a measurement. Laser is switched off after taking the measurement.

The brightness of illumination
Brightness of the display has 6 levels. Change the level of brightness by pressing button + or — .

Sound alarm
Swith sound on/off by pressing button + or — .

Offset - change the zero point
If you selected the Offset function in the menu, you can now adjust the value using buttons
+ or — . Press the key for a long time to increase the rate of change of the values.

Tilt sensor Calibration
You can calibrate the tilt sensor by two measurements on a level surface (e.g. on the marble floor or tabletop).
A. Press button ▭ to calibrate the tilt sensor.
B. Carry out a first measurement on a level surface. Press button ▭ to confirm the measurement.
C. Rotate the device horizontally through 180°.
D. Press button ▭ to finish the second measurement.
Then the tilt sensor is calibrated.

Bluetooth
This function is used to switch the Bluetooth ON or OFF.
Factory reset
The instrument has a Reset function. If you select the menu function Reset and confirm, the device returns to the factory settings.

All customised settings are also lost.

Clear-Key
Cancel the last action. Press button $\boxed{\text{CLEAR} \atop \text{OFF}}$.

OPERATION

Switch on and off
Switch on $\boxed{-}$ the instrument and laser. Pressing this button $\boxed{\text{CLEAR} \atop \text{OFF}}$ for a long time to switch the instrument off. The instrument switches off automatically after 3 minutes of inactivity.

Clear
Press button $\boxed{\text{CLEAR} \atop \text{OFF}}$ to delete the last action. Each single measurement can be deleted and remeasured, while

making area or volume measurements.

Reference setting
The default reference setting is from the rear of the instrument. Press button [TIME] et the reference from the edge part of the tool (default), front part of the tool, from the end-piece, from the thread that is located on the back part of the tool. The selected reference point is displayed on the display by appropriate icon.

MEASUREMENT

Single distance measurement
Press button ▬ to activate the laser. When in continuous laser mode, press this button to trigger the distance measurement directly.
Press button ▬ again to start measurement. The result is shown on the display.

Minimum/ Maximum measurement

This function allows the user to measure the minimum or maximum distance from a fixed measuring point.

Press and hold down the button ▬ . Then slowly sweep the laser back and forth and up and down over the desired target point (e.g. into the corner of a room).

Press ▬ to stop continuous measurement. The values for maximum and minimum distances are shown on the display. Last measured value is displayed in the low line.

FUNCTIONS

Addition/subtraction

The instrument can add and substract the results of the measurement. Press button ▬ to take the first

measurement.

Press button ⊞ . Next measurement is added to the previous one.

Press button ⊟ . Next measurement is substracted from the previous one.

Press button MENU . The result is desplayed in the main display area.

Press button CLEAR OFF . Last action will be cancelled.

Area

Press button ▱ until the symbol ◆ is displayed.

Press button — to take the first measurement: length.

Press button — to take the second measurement: width.

The result of the measurement is displayed in the main display area.

Additional information: perimeter is displayed above the main display area.

Volume

Press button [⬛] until the symbol [🔴] is displayed.

Press button [—] to take the first measurement: length.

Press button [—] to take the second measurement: width.

Press button [—] to take the third measurement: height.

The result of volume measurement is displayed in the main display area.
Additional information: area and perimeter are displayed above the main display area.

Wall-surface measrement

The wall surface measurement is used to determine the sum of several individual surfaces with a common height.

Press button [symbol] until the symbol [symbol] is displayed.

Press button [symbol] to take the height measurement. (The height must be measured first.)

Press button [symbol] to measure the length of 1st wall.

Press button [symbol] to measure the length of 2nd wall.

Press button [symbol] to measure the length of Nth wall.

Additional information:the total surface value is shown in the summary line. The sum of all the lengths is shown above the summary line.

Tilt measurement

Press button [⟋] to activate the tilt sensor. The symbol a ⟋ appears on the display. Depending on the setting the tilt is shown in ° or %.

Press button [▬] to measure the inclination and the distance.

During tilt measurement, the instrument should be held without a transverse tilt (max. 10°).

Indirect vertical distance

Press button [⟋] until the symbol a ◺ is displayed.

Press button [▬] to measure the inclination and the distance. The summary line displays the result of the vertical distance.

Additional information: horizontal distance is displayed above the summary line. Upper lines show inclination distance and angle of inclination.

Staking out function

This function allows to set two different distances (a and b) and mark definite measured distance.

Press button [≯τ] until the symbol [ɸɸɸ x y] is displayed.

With buttons [+] and [−] you can adjust the values to suit the desired stacking out distance. After the stacking out value is set, press button [—] to confirm it. Press [CLEAR OFF] to cancel this setting.

After the stacking out value "a" is confirmed, value "b" is flashing on the display. The process of addition value "b" is the same as for value "a". Press button [MENU] when the value is set.

Press button [CLEAR OFF] to cancel value "b"and return to the value "a". Press button [—] to start measurement.

Summary line shows the distance to the set value and the direction of the movement.

Additional information: distance from the reference point (surface) and the distance from the nearest set point to the reference point (surface).

The displayed distance decreases if the instrument is moved slowly along the stake out line. The instrument starts to beep at a distance of 0.1m from the next stake out point.

Indirect measurement
The instrument can calculate distances by using Pythagoras' theorem. This function is helpful, if the distance to measure can not be reached directly.
Make sure you adhere to the prescribed sequence of measurement:
- All target points must be in a horizontal or vertical plane on the wall surface.
- The best results are achieved when the instrument is rotated about fixed point (e.g. with the positioning bracket fully folded out and the instrument placed on a wall or the instrument is mounted on a tripod.
- It is possible to use the minimum / maximum function. The minimum value must be used for measurements at right angles to the target; the maximum distance is used for all other measments.

Pythagorean calculation
Single Pythagorean calculation 1
This function allows to measure height or width of a building.

Press button until symbol a appears on the display.

Press button . Aim at the upper point a and trigger the measurement. The value is adopted. Keep the instrument as horizontal as possible.

Press button to trigger the measurement a . Then the value is adopted. You can also press and hold down button to trigger continuous measurement. Sweep the laser back and forth and up and down over the target point. The result is shown on the display.

Additional information: triangle area and angle between measured distances are shown above the sum-

mary line.

Pythagorean calculation 2

Press button ◁ until symbol appears on the display.

Press button ▬ to trigger the measurement. When the value is receivedm press button ▬ to take

next measurement .

The result is displayed in the summary line. Additional information: triangle area is shown above the summary line.

Pythagorean calculation 3

This calculation is used to determine a distance by 3 measurements.

Press button ◁. Symbol appears on the display.

Press button ◁ to trigger the measurement. Then the first value is received ◁.

Press button ▬ to trigger the measurement. Then the second value is received.

You can also press and hold down button ▬ to trigger continuous measurement. Sweep the laser

back and forth and up and down over the target point.

Press button to stop the measurement. The minimum value ■◁ is received.

Press button ▬ to trigger the measurement. Then the third value ◁ is received.

The result is displayed in the summary line. Additional information: triangle area and angle between first

and last measured distances are shown above the summary line.

Pythagorean calculation 4

This calculation is used to determine a height by 3 measurements.

Press button. Symbol appears on the display.

Press button to trigger the measurement. Then the first value is received.

Press button to trigger the measurement. Then the second value is received.

Press button to trigger the measurement. Then the third value is received.

You can also press and hold down button to trigger continuous measurement. Sweep the laser back and forth and up and down over the target point.

Press button to stop the measurement. The minimum value is received.

The result is displayed in the summary line. Additional information: triangle area and angle between

first and second measured distances are shown above the summary line.

Triangular area measurement

The area of a triangle can be calculated by the measurement of three sides.

Press button ◁. Symbol △ appears on the display.

Press button ▬ and measure the first side of the triangle △.

Press button ▬ and measure the second side of the triangle △ .

Press button ▬ and measure the third side of the triangle △.

The result is displayed in the summary line. Additional information: perimeter of the angle and angle between second and third measured distances are shown above the summary line.

Trapezoid measurement
This function is used to measure length of the roof, the trapezium area and the inclination angle.

Trapezoid measurement 1

Press button ▢ . Symbol ⬜ appears on the display.

Press button ▬ to take the first measurement: height ⬜ .

Press button ▭ to take the second measurement: width ⬜ .

Press button ▬ to take the third measurement: height ⬜ .

The result is displayed in the summary line. Additional information: trapezoid area and inclination angle of the total distance are shown above the summary line.

Trapezoid measurement 2

Press button [ ] until this symbol appears on the display .

Press button [—] to take the first measurement: height .

Press button [—] to take the second measurement: distance between corner and roof .

Press button [—] to take the third measurement: width .

The result is displayed in the summary line. Additional information: Trapezoid area and inclination angle of the total distance are shown above the summary line.

Trapezoid measurement 3

Press button [—] until this symbol appears on the display .

Press button — to take the first measurement: height ▢.

Press button — to take the second measurement: distance between corner and roof ▱, inclination angle.

The result is displayed in the summary line. Additional information: trapezoid area and inclination angle of the total distance are shown above the summary line.

Timer
Press and hold button [TIME] to set a 5-second time delay. Use buttons + and — to set the desired time delay. Once the key is released , the remaining seconds until measurement (e.g. 59, 58, 57...) are shown on the display. The last 5 seconds are counted down with a beep. After the last beep the measurement is taken and the value is displayed.

MESSAGE CODES
All message codes are displayed with "Info" or Error. Last 5 seconds are accompanied by the audible signal. The tool starts measurement after the last signal.

Info	CAUSE	REMEDY
204	Calculation overflow	Repeat procedure
205	Ranging transfinite	Use in allowed ranging

Info	CAUSE	REMEDY
252	Temperature too high	Cool down instrument
253	Temperature too low	Warm up instrument
255	Receiver signal too weak	Use target plate
256	Received signal too strong	Use target plate (grey side)
206	Wrong parameter	When measuring by Pythagoras, the length of hypotenuse should greater than the other two legs. The parameter must have the same unit.
160	Over angle	Hold the instrument without any transverse tilt
156	Hardware Transverse tilt greater than 10°	Hold the instrument without any transverse tilt

TECHNICAL DATA

Range (use target plate to increase the range), m*	0.05 to 120
Accuracy, mm*	±1.5
Smallest unit displayed	1 mm
Distance measuring by tilt sensor	90°
Tilt sensor accuracy	±0.3°
Laser class	2
Laser type	635 nm, <1 mW

Automatic switch off	3 minutes of inactivity
Battery life, 2 x AA (lithium)	up to 20000 measurements
Dimensions, mm	137×52×28
Weight, g	150
Power supply	3 x AAA or lithium battery 3,7V
Temperature range: Storage Operating	 -25º to +70º -10º to +50º

* In favourable conditions (good target surface properties, room temperature).

Maximum deviation occurs under unfavorable conditions such as bright sunlight or when measuring to poorly reflecting or very rough surfaces. For distances over 80m – without using a target plate – the maximum deviation may increase to a maximum of ±10mm.

** This is the typical value. For the limiting conditions (e.g. limiting temperature), the deviation increases a little.

Measuring conditions

Measuring range: At night, at dusk and when the target is shadowed the measuring range without target plate is increased. Measurement distance can be decreased during daylight. Use a target plate to increase the measurement range during daylight or if the target has a bad reflection.

Measuring Surfaces

Measuring errors can occur when measuring toward colorless liquids (e.g. water) or dust free glass, styro-

foam or similar semi-permeable surfaces. Aiming at high gloss surfaces deflects the laser beam and measurement errors can occur. Against non-reflective and dark surfaces the measuring time can be increased.

Precautions
Please, handle the instrument with care.
Avoid viabrations, hits, water, effect of heat.
During transportation put the instrument into the soft bag.
Note: the instrument should be dry!

Care and cleaning
Do not immerse the instrument in water. Wipe off dirt with a damp, soft cloth. Do not use aggressive cleaning agents or solutions.

Specific reasons for erroneous measuring results
- Measurements through glass or plastic windows;
- Dirty laser emitting window;
- After instrument has been dropped or hit. Please check the accuracy;
- Large fluctuation of temperature: if instrument will be used in cold areas after it has been stored in warm areas (or the other way round) please wait some minutes before carrying out measurements;
- Against non-reflective and dark surfaces, colorless surfaces and so on.

Electromagnetic acceptability (EMC)
It cannot be completely excluded that this instrument will disturb other instruments (e.g. navigation systems); will be disturbed by other instruments (e.g. intensive electromagnetic radiation nearby industrial facilities or radio transmitters).

Laser classification

The instrument is a laser class 2 laser product with power < 1 mW and wavelength 635 nm. Laser is safety in ordinary conditions of usage. ADA COSMO 120 projects visible laser beam from the front part of the instrument.

The instrument is a laser class 2 laser product accortding to DIN IEC 60825-1:2007. It is allowed to use unit following further safety precautions (see operating manual).

WARRANTY

This product is warranted by the manufacturer to the original purchaser to be free from defects in material and workmanship under normal use for a period of two (2) years from the date of purchase.

During the warranty period, and upon proof of purchase, the product will be repaired or replaced (with the same or similar model at manufactures option), without charge for either parts of labour.

In case of a defect please contact the dealer where you originally purchased this product. The warranty will not apply to this product if it has been misused, abused or altered. Withiut limiting the foregoing, leakage of the battery, bending or dropping the unit are presumed to be defects resulting from misuse or abuse.

EXCEPTIONS FROM RESPONSIBILITY

The user of this product is expected to follow the instructions given in operators' manual.

Although all instruments left our warehouse in perfect condition and adjustment the user is expected to carry out periodic checks of the product's accuracy and general performance.

The manufacturer, or its representatives, assumes no responsibility of results of a faulty or intentional usage or misuse including any direct, indirect, consequential damage, and loss of profits.

The manufacturer, or its representatives, assumes no responsibility for consequential damage, and loss of profits by any disaster (earthquake, storm, flood ...), fire, accident, or an act of a third party and/or a usage in other than usual conditions.

The manufacturer, or its representatives, assumes no responsibility for any damage, and loss of profits due to a change of data, loss of data and interruption of business etc., caused by using the product or an unusable product.

The manufacturer, or its representatives, assumes no responsibility for any damage, and loss of profits caused by usage other thsn explained in the users' manual.

The manufacturer, or its representatives, assumes no responsibility for damage caused by wrong movement or action due to connecting with other products.

WARRANTY DOESN'T EXTEND TO FOLLOWING CASES:

1. If the standard or serial product number will be changed, erased, removed or wil be unreadable.
2. Periodic maintenance, repair or changing parts as a result of their normal runout.
3. All adaptations and modifications with the purpose of improvement and expansion of normal sphere of product application, mentioned in the service instruction, without tentative written agreement of the expert provider.
4. Service by anyone other than an authorized service center.
5. Damage to products or parts caused by misuse, including, without limitation, misapplication or nrgligence of the terms of service instruction.
6. Power supply units, chargers, accessories, wearing parts.
7. Products, damaged from mishandling, faulty adjustment, maintenance with low-quality and non-standard materials, presence of any liquids and foreign objects inside the product.
8. Acts of God and/or actions of third persons.
9. In case of unwarranted repair till the end of warranty period because of damages during the operation of the product, it's transportation and storing, warranty doesn't resume.