



EN



Rotation Laser **NL610**

*Thank you for purchasing a Nivel System NL610 laser level.
To best use the purchased instrument,
Please read the instructions carefully and put in a convenient spot
so that in the future you will be able to use it.*

NOTE:
The device comprises a nickel-hydrogen batteries, the batteries must
be recycled and should be disposed of
in accordance with the requirements (WEEE-Reg.: DE23874031)

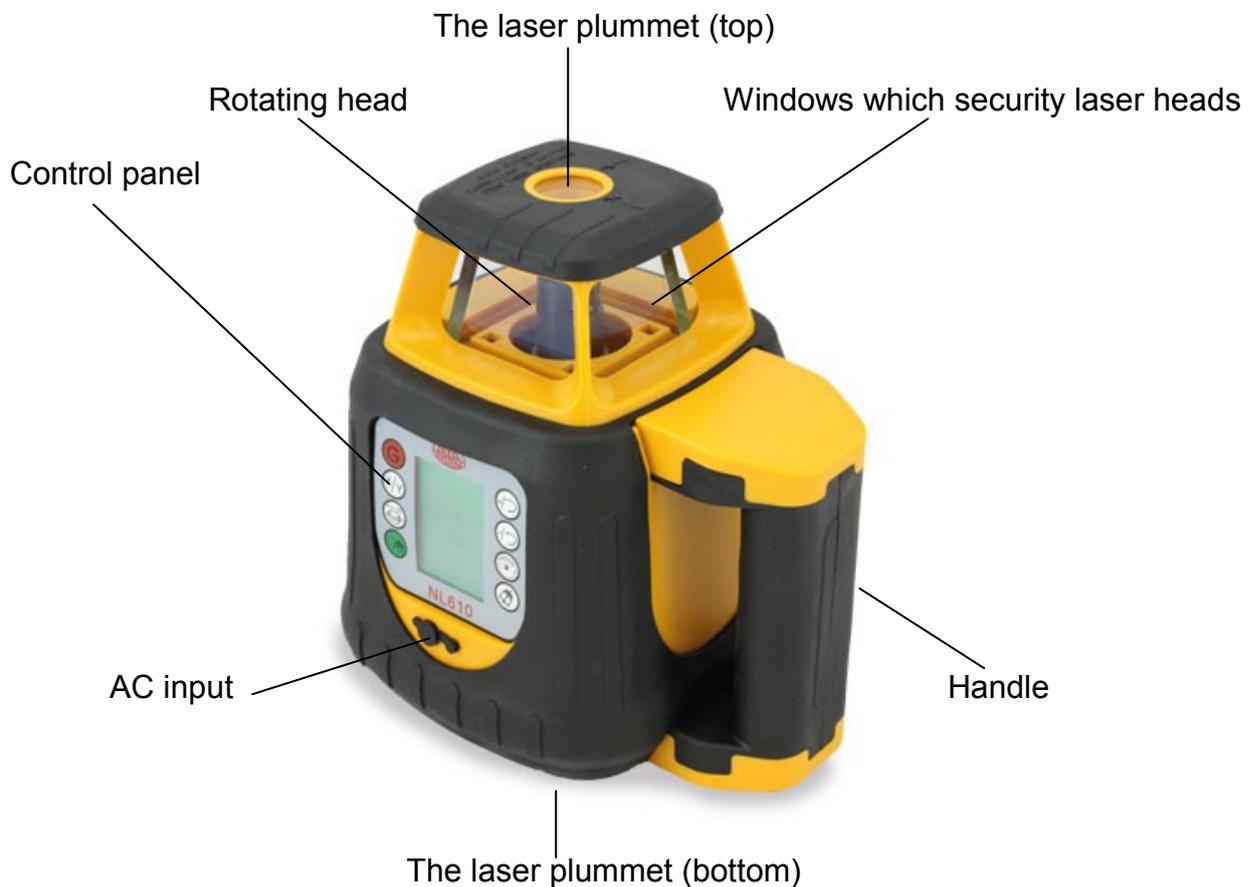


INTRODUCTION

Multitasking self-leveling laser construction levels are used to determine the height in construction measurements. Model 610 has a visible light beam and it can be used at work inside and outside the building. The device is powered by rechargeable batteries which use advanced micro-controlled charging technology.

NL series levels may designate a vertical or horizontal laser plane, additionally the device define the axis of the laser plane (laser line - point up and down). The device can also "draw" a laser line (scan function) – thanks to it it's possible to stop the beam at a given distance. NL610 models can be controlled from the device control panel or remotely, with remote control.

Laser level is waterproof and can be used outdoors, even in the rain. However, these devices can't be submerged in water



PRECAUTIONS

WARNING: the device has a built in laser source which generates laser beam. It is not allowed to disassembly the device by "your own".

There is a risk of fire, electric shock, or injury while self-repair.

Repairs can be made only by Nivel system service or its authorized representatives.

The laser beam can be hazardous to the human eye if the device is improperly operated.

- Never repair the laser by your own.
- Protect your eyes from damage.
- Never look into the laser beam
- Risk of fire and electric shock.
- Never use a wet battery.
- The possibility of explosion.
- Never use a laser level near flammable gases and liquids.
- A short-circuit may cause a fire.
- Pay attention to not to short-circuit the battery while storing the device.

Protection against shock

When transporting the instrument it should be protected against shocks. Strong shocks can cause measurements errors.

The user of this instrument should follow the instructions contained in this manual and remember to periodically check the correctness of its working. The manufacturer is not liable for any damage resulting from the incorrect use of the instrument and losses due to this.

Improper use of the laser and use not in accordance with instructions described in this manual, can cause injury or exposure to excessive radiation dose.

Do not allow anyone to work in a laser beam. Before you begin, make sure that the laser beam is over the heads of workers. The lighting by laser beam can cause temporary blindness. When it's possible, use warning signs when construction machines are working near laser level

Do not expose the body and clothing to the acid leaking from batteries and accumulators. However, if it occurs, quickly wash the body with clean water and consult a doctor.

Broken or damaged transport box or transport box latches can lead to falling out of the box and damage the laser.

The collapse of laser level to the ground can lead to damage.

Shaky, unstable site of laser level can lead to collapse and damage the laser. Always make sure that all screws and latches in a tripod works properly.

Exclusions of liability

1. It is expected from the user to comply all recommendations regarding to the use of this product and perform periodic reviews of the work of the instrument.
2. The manufacturer, or its representatives assume no liability for damages caused by improper handling or intentional improper use , including direct or indirect damage and loss of income.
3. The manufacturer and its representatives are not liable for damage or loss of income caused by natural disasters (earthquake, storm, flood, etc.), Fire, accident or involving third parties in use of this instrument or using the instrument under conditions other than normal.
4. The manufacturer and its representatives are not liable for any damages, loss of income, loss of data, interruption of business, etc., Caused by the use of the product.
5. The manufacturer and its representatives are not liable for any damages and loss of income caused by the use of the instrument in a way other than described in the manual.

6. The manufacturer and its representatives are not liable for damage caused by improper activities or reactions as a result of combining with other products.

BATTERIES

The NL610 used nickel-hydrogen batteries that can be recharged.

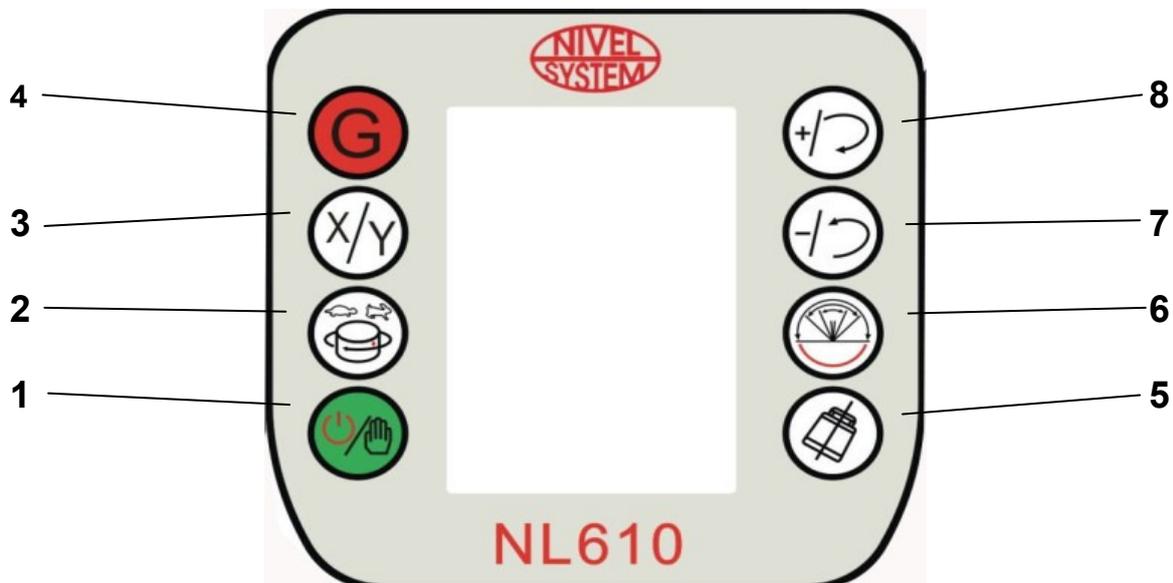
Charging the battery is done by the AC adapter (included in standard) - Use the connector on the front panel of laser level.

Charging process is indicated by illumination of the LED. When the LED lights up green, the charging process is **completed**. . Charging last for about 7 hours.

If it's necessary to replace the battery - battery compartment should be unscrewed with a screwdriver. Replacement batteries can be purchased from an authorized distributor.

Use levellers NL610 with care, protect from moisture. Never put a wet instrument to the transport box (wait until dry).

CONTROL PANEL



Description of buttons and functions:

1) On / off power and switch to manual mode

- Turns on and off

- Longer press of a button - approx. 6 seconds. (when the equipment is turned on) enables / disables the manual mode. The equipment in manual mode can be tilted (beyond self-leveling) or work in difficult terrain, near the heavy construction equipment (does not react to the vibrations of the land). When the equipment is switched to manual mode, the display shows the "hand" icon.

2) Adjusting the rotation speed of the head

- available head spin speeds: 0-60-120-300-600 rpm. Each press will switch speed. When working on smaller distances, classic measurements - choose 300 rpm. When working on large distances and with the cooperation of machine control systems, select 600 rpm. Keep in mind that the faster the head rotates, the energy consumption is greater

3) Select the inclination in axis (X, Y)

- Use the button to select the direction of the inclination (X or Y axis). Plane can be tilted up to $\pm 8\%$

4) laser inclination mode switch (device automatically switches to manual mode)

5) movement alarm mode (TILT)

- The laser is able to secure. While the device is moved, placed in another place (which can cause incorrect measurements) – it turns off (system beeps). In such a situation, turn off and on laser level again (or turn off the TILT by holding longer the button 5)

6) directional scan button - narrowing of the laser line in the required range (where the work is carried out)

- available display of beam angles: $0-10^\circ$ -45° -90° -180° . Each press will switch the display of the beam angle.

7) MINUS / right rotation

- Use the key to: subtract the value of inclination (minus) / heads turn to the right (when the head is not spinning or level is switched into scan mode)

8) PLUS / counter-clockwise rotation

- Use the key to: add the value of inclination (plus) / turn heads left

WORKING WITH LASER LEVEL

Turning on the power

On the front panel press button 1. The instrument will level by itself and the power LED lights up. Press the button again to turn off the power.

Once leveled up, the laser LED stops blinking and the laser head rotates at a speed of 600 rpm. If instrument will be set inclined more than $\pm 5^\circ$, it won't level by itself.

Rotating laser head mode

button 2 allows you to adjust the speed of laser head rotation. Switching the speed is carried out by pressing again this button

Scan mode

Adjust the rotating speed of the head. Press button 6 which will cause the device goes into scan mode, the laser will begin to "draw" a line at set distance. Each time when you press this button you will cause increase the range of "drawn" line. Depending on your needs, switch the direction of rotation of the head (clockwise or counter-clockwise).

The inclination of laser plane

NL610 allows you to incline the laser plane in one or two directions

Press 4 button which will go into a mode of enter the inclinations

Press 3 to enable selection of the axis along which surface will be tilted (X or Y).

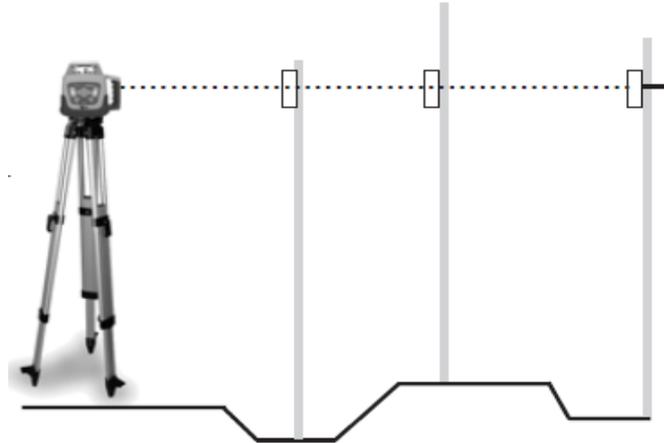


To set the inclination in the X-axis, press the buttons 7, respectively (positive values) or 8 (negative values) - every time pressing the laser beam will tilt to the surface - in the X or Y plane, on the top cover of the laser are marked directions of inclinations. Positive values will incline laser plane according to the arrow on the top cover, negative - in the opposite direction)

After entering the inclination value for the X-axis, Y-axis, press 3 again after approx. 3 seconds, the plane begins to be tilted to entered values.

Press the 4 button to exit set inclination mode, the plane will be automatically leveled.

PRINCIPLE OF OPERATION



Height Measurement

Turn the power on to Level the instrument itself. Once leveled, the laser head starts to spin, setting the laser plane. Attach the laser sensor on the laser staff. Place a laser staff with attached sensor on a benchmark (zero point)- reset the position of sensor (adjust the height of the sensor to define a zero level, the laser staff should also indicate zero). Move the laser staff with sensor to another point which height you want to measure, adjust the height of the sensor to place it in the field of the laser beam - move it up or down on the laser staff. The difference of sensor positions on the staff will indicate the height differences of the measured point compared to the benchmark.



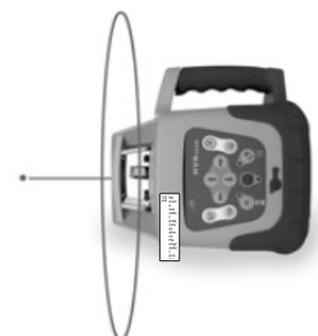
Slope determination

Set the laser level on a tripod. Set the laser level in the axis you want to tilt and turn on the laser level. The laser plummet (bottom) indicates the first point of the axis, on the other end point set the laser staff with laser sensor - reset position (sensor and staff). Depending on the desired value of inclination slide the sensor on a staff and by remote control change the inclination of the laser plane in order to fit in the position of the laser sensor (this shift of laser sensor will specify the inclination, eg. If you want to get a inclination of 1%, at a distance of 10 m (laser staff) the difference between the height of the zero point on the staff should and designated inclination should be 10 cm).



Working with the vertical plane

NL610 can set horizontal or vertical beam. If you work with a vertical laser beam you must set the laser level as in the picture beside. After



switching on the laser level the device will level by itself – the head will start to rotate - setting a vertical plane.

The laser plummet (top) defines a line perpendicular to the plane of the laser level, which is used in all perpendicular works (building partitions, setting 90° angle, etc.).

Remote control

Features of NL610 laser level can be controlled remotely using the remote control. On the remote control panel there are buttons that correspond to those included on the front panel of laser level. The operating range of remote control is approximately 20 meters (depends on the conditions on the site)

The procedure for changing the transmission channel.

Changing the channel must be carried out separately on the remote control and laser level.

Changing the channel on the remote control:

- Turn the remote by on/off switch by holding it so long until you see the blinking icon similar to the phone and will be displayed next to the channel number.
- Change the channel number by pressing + or -.
- Confirm by holding down the power button on remote control.

Changing the channel in laser level:

- Turn the laser level.
- Hold the X / Y for about 5 seconds. You will see the blinking icons: antenna and channel number.
- Change the channel number using the + or - on the same as the one set the remote control.
- Remember, holding the X / Y until turns off the channel number.
- antenna icon continue to blink.
- Then turn off the laser level and turn it on again.
- non-blinking antenna icon indicates a proper connection with the remote

NOTE:

In exceptional cases, you may experience instability working of laser level in cooperation with the remote control. This is caused by data transmission system between the remote control and leveling tool. The communication system is based on a radio transmitter operating on UHF. In this range there are multiple transmission systems and their frequencies can interfere with each other. In the case of unstable behavior leveling change the channel on the remote control communicates with the leveling tool.

Checking the laser level

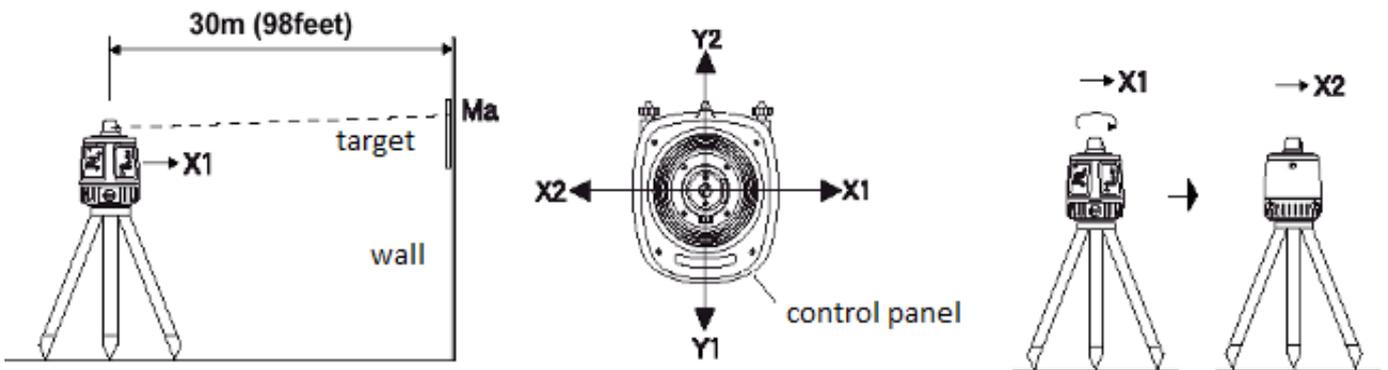
You should regularly check the following parameters of the laser level

- setting a horizontal plane
- cone error
- setting a vertical plane

Checking and calibration of the horizontal and vertical planes is simple and in most cases can be done by the user. Checking the cone error can be also done by the user, but this error can be only removed by an authorized service center.

Checking the horizontal plane

(1) Checking



Set the instrument about 30m from the wall so that the X-axis is perpendicular to the wall and X direction a pointed to a wall.

Turn on the instrument and wait until it level automatically.

Place a sheet of paper on the wall. Mark the position of the laser beam (Ma) on the sheet. Turn off the instrument.

Loosen the tripod fixing screw and rotate the instrument 180 °.

WARNING! Be careful not to move the instrument while the head is spinning.

Turn on the instrument once again and wait until it level automatically.

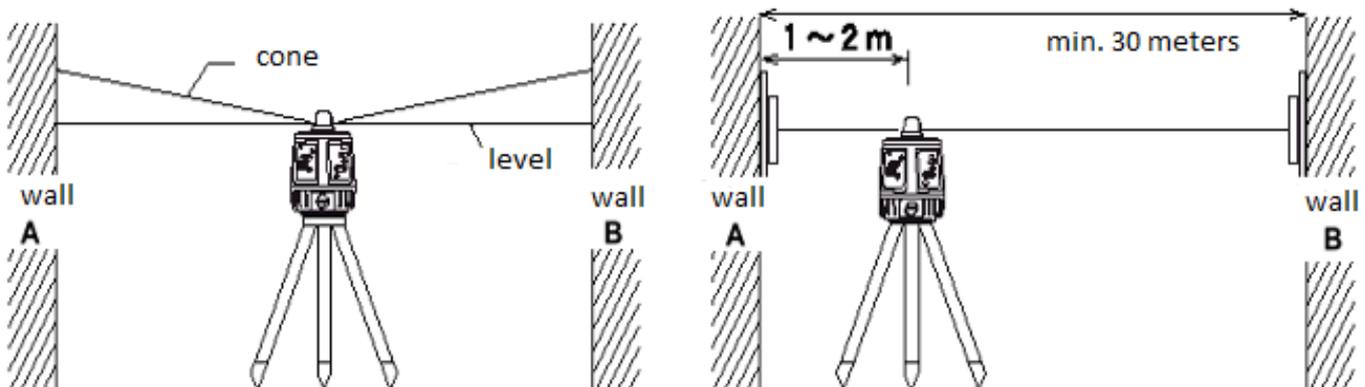
Once again mark the position of the laser beam on the sheet (Mb).

Measure the distance between the marks Ma and Mb, if the distance is less than 6 mm calibration is not necessary, in other case please contact service center

Perform similar operations for the Y axis .

Checking the cone error

Please do this procedure after calibration of horizontal plane.



Set the laser centered between the walls distanced from each other of 30 m. Set the instrument in the X or Y direction.

Mark the position of the laser beam on both walls.

Turn off the instrument and move it near to the of one of the walls (1 to 2 meters). Do not change the orientation of the axes. Turn on the instrument.

Again, mark the position of the laser beam on the walls

Measure the distance between the marks on the walls.

If the difference in distance is less than 3 mm, it can be assumed that this error does not occur.

Warning! If this error is more than 3m, you should contact the service center.

Checking the vertical plane

This procedure should be done after calibration of the horizontal plane.

Checking

Set the laser centered between the walls distanced from each other of 30 m

Turn on the laser level.

Place the paper sheets on the walls and mark the position of the laser beam.

Turn off the instrument. Set the instrument in vertical position near to one of the walls.

Turn on the instrument.

Mark the position of the laser beam on the paper sheet. Measure the distance between the markers

Do not change the position of the laser and spin it 180°.

Mark the position of the laser beam on the paper sheet. Measure the distance between the markers

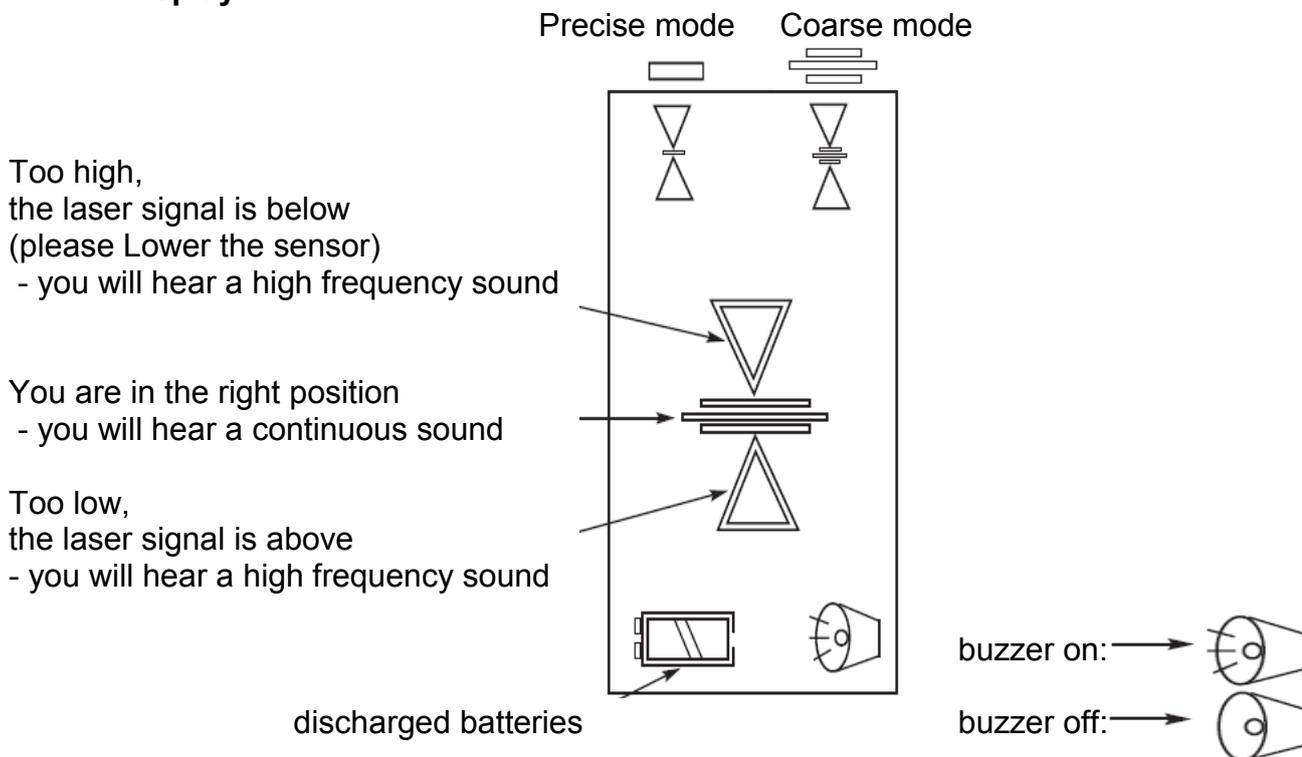
If the distance between the markers is less than 3mm calibration is not necessary.

Laser sensor

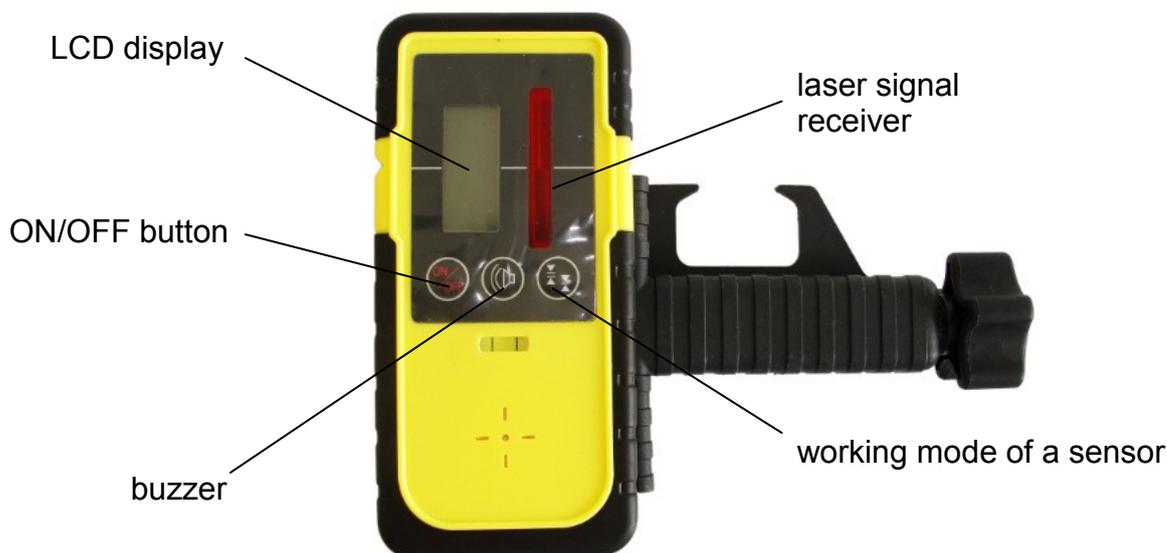
1. Specification

Range of reception:	50 mm
Accuracy operation modes:	precise: ± 1 mm coarse: ± 2 mm
display:	LCD
power	DC 9 V (alkaline battery)
auto turning off :	The sensor is automatically turn off in 30min if it will not detect a laser beam, (if you want to turn the sensor on once again please press the power button.
Working temperature:	from -20°C to $+ 50^{\circ}\text{C}$
Dimensions:	135 x 65 x 24,5 mm
Weight:	0,15 kg

2. LCD Display



3. Sensor panel



NL610 technical specification

Laser	red beam
Accuracy	15", $\pm 3,6\text{mm}/50\text{m}$
Accuracy of laser plummet	$\pm 1\text{mm}/1,5\text{m}$
Self-leveling range	$\square 5 \square$
Inclination (X and Y axis)	$\pm 8\%$
Work range (diameter)	600 m (with sensor)
Laser head rotation speed	modes: 0-60-120-300-600 rpm
Scanning	0-10°-45°-90°-180
Light source	laser diode , 635 nm,
Working temperature	-20°C ~ +50°C
Power	DC 4,8-6 V, 4 rechargeable batteries (type D, NiMH)
Working time	about 20h
Battery charging time	about 7h.
Dust and waterproof	IP55
Dimensions	160 x 160 x 185 mm
Weight	3,0 kg

Remote control technical specification

Working range about 30 m (outside about 20m)



Warning:

AC Adapter could not be used outside. Do not use it for charging alkaline batteries. Device look such as tech spec. could be changed without any information for customer.

Free extended warranty - 24 months

To use the free warranty extension to 24 months, the instrument must be registered within 3 months from the date of purchase. Registration is done via the website: <http://www.tpi.com.pl/rejestracja-gwarancji>



Nivel System – service and support

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