# NITRATE METER iEco LifePro2

THE DEVICE CONSTRUCTED FOR MEASURING THE NITRATE CONCENTRATION AND ESTIMATING THE DRINKING WATER QUALITY

сделано в России
i4Technology
электронные системы

INTK 414333.001 RE


# USER MANUAL

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To get acquainted with your new EcoLife PRO-2 nitrate meter's internal design and rules of operation (correct use, technical service, repair, storage and transportation) please read the supplied manual carefully.

EcoLife PRO-2 nitrate meter is a hand-held device, produced to measure the quantitative nitrate content (rapid analysis) in fresh fruits, vegetables, meat and infant food. The device also can be used as salimeter (TDS-meter) that measures the concentration of water-insoluble inorganic impurities (the salts of different metals generally).

The nitrates are the nitric acid salts (NO3), contained in the soil and absorbed by the plants from the soil. Thanks to their positive influence on the crops growth and fecundity, and the harvest ripening speed, nitrates are widely spread in agriculture. When getting into human body, nitrites react with its microflora and transform into nitrites (NO2). The nitrites are absorbed into the blood stream from the intestinal tract and having aggregated with hematoglobulin form methylhemoglobin. Methylhemoglobin is a stable chemical compound that doesn't transport oxygen. It induces hypoxia, accumulation of lactic acid in tissues, tissue intoxication and histolysis.

However most researchers today believe that the cancer is the main danger, especially the gastro-intestinal cancer. With the nitrites, cancerigenic nitrate amides and amines can be synthesized from almost any food both in stomach and intestinal tract.

**Attention!** Please note that the measuring results of the present device cannot replace chemical analysis performed in a professional laboratory. The product is not intended for professional use in the field of national metrological monitoring. The data measured by it cannot be used for making official reports on the nitrate concentration in fresh fruits, vegetables, meat and infant food.

**Attention!** The device is intended to measure nitrates in fruits, vegetables, fresh meat and infant food only. Sausage, ham and gammon, etc. contain chemical compounds used for smoking, coloration, etc. that invalidates the measurement!

**Attention!** Manufacturer reserves the right to make changes in the list of testable foods without previous notice!

**Attention!** After storing the product in a cold place or transporting it in winter you should keep the device at room temperature for 2 hours before operating.

**Attention!** Please request to perform functional testing before purchase. Also make sure that the warranty sticker placed into the battery compartment is not damaged. Check the delivery set against article 1.3.1 of this manual. Ensure the warranty card is signed, dated and stamped.

**Attention!** Read this manual carefully in order to use the product efficiently and safely for a long time.

Follow the rules, restrictions and instructions contained in the manual to increase the lifespan of the equipment and to use it most effectively.

The manufacturer's warranty will become invalid prematurely if the user of the equipment does not follow the storage and transportation instructions.

## 1 SPECIFICATION AND OPERATION

### 1.1 Intended usage and operation area

1.1.1. EcoLife PRO-2 nitrate meter is produced to measure the quantitative nitrate content (rapid analysis) in fruits, vegetables, fresh meat and infant food. The product's working principle is based on measuring the electrical conductivity of fruits, vegetables, fresh meat and infant food.

The device also estimates the quality of water used for domestic and technical purposes from different sources (streamline filters, pitchers, water wells, etc). When measuring the water hardness level (level of general water salinity), the measurements of ppm (particles of dissolved substance per million particles of water) are performed by the device.

1.1.2. The software of the equipment provides:

- original algorithm of measuring the quantitative nitrate content in foods and the salt content in water;
- indication of the quantitative nitrate content in tested food together with the indication of the maximum allowable concentration (MAC);
- indication of the battery charge level;
- indication of current date and time;
- storing the history of testing that can be reviewed.

### 1.2 Technical features

1.2.1 In Picture 1 you can see the external design of the product.


Picture 1 – External design

1.2.2 Technical features are presented in Table 1.

| Technical feature | Value |
|---|---|
| Nitrate measuring range, mg / kg | from 20 to 10 000 |
| TDS measuring range, mg / L | from 0 to 999 |
| Measuring time, sec, max | 15 |
| BC voltage (two AAA batteries), V | from 2,2 to 3,2 |

| | |
|---|---|
| Input current, mA, max | 210 |
| Operation conditions:<br>- temperature, °C<br>- humidity at 30 °C, % | <br>from +5 to +40°C<br>below 95 |
| Dimensions, mm | 112×65×30 |
| Weight, g, max | 120 |

Table1

### 1.3 Device components

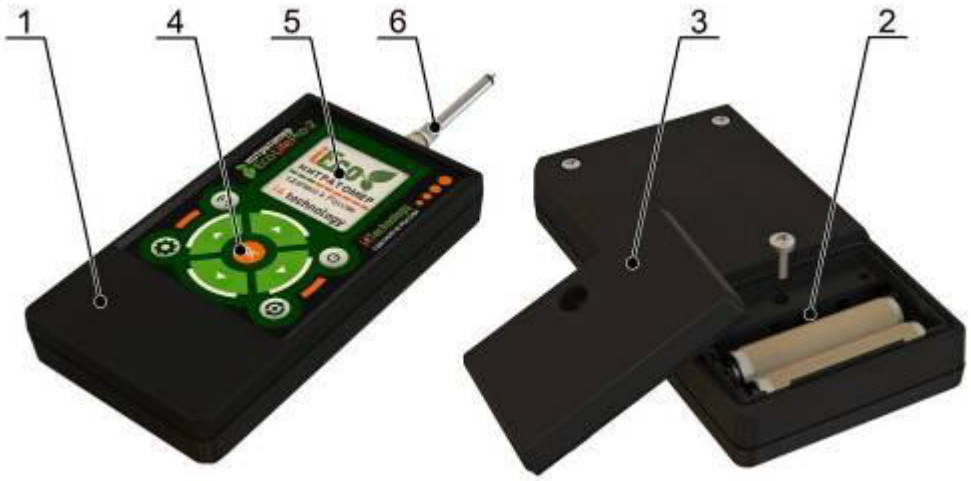
1.3.1 Table 2 below gives the information about the device components and contents of delivery.

| № | Name | Number | Note |
|---|---|---|---|
| 1 | EcoLife PRO-2 nitrate meter TC 4215-008-6406207-2015 | 1 | |
| 2 | Battery type AAA | 2 | preinstalled |
| 3 | Measuring probe | 1 | |
| 4 | Case | 1 | |
| 5 | Packaging box | 1 | |
| 6 | User manual INTK.414333.001 RE | 1 | |

Table 2

**1.4 Internal design and operating**

1.4.1 EcoLife PRO-2 nitrate meter is a portable device with the self-contained power supply.




Picture 2 – Scheme of main parts

1. Enclosure.

2. Battery compartment.

3. Battery compartment's cover.

4. Keyboard.

5. OLED-display.

6. Measuring probe.

1.4.2. The product provides measuring and indicating of quantitative nitrate content in foods and salt content in water. The product also provides indicating of additional information that includes:

- data (day, month, year);

- current time (hours, minutes);

- battery charge level.

1.4.3. Device control:

 - Power button («ПИТАНИЕ») allows to switch the device ON and OFF (by long-term pushing of the button) and return to the Food group list (by short-term pushing of the button);

 - Setup button («НАСТРОЙКИ») allows you to switch back and forth from the Setup menu;

- Button box allows to navigate through the Settings menu and food groups' items lists and select values;

 - Measurement button («ИЗМЕРЕНИЕ») allows you to switch to the Measurement mode;

 - History button («ИСТОРИЯ») allows to display the history of testing.

1.4.4 The power is carried out by two AAA batteries. Please see how to install batteries into enclosure on the battery compartment bottom and in Picture 3.


Picture 3 – Batteries installation scheme

*Note. You can use accumulators of the same type instead of batteries. In this case charge the accumulators by yourself using the external power supply.*

## 2. Correct use

### 2.1 Usage limitations

2.1.1. Keep the battery compartment and the power contacts clean.

2.1.2. Change the discharged batteries in time.

2.1.3. Prevent the product from water and foreign bodies' intrusion.

### 2.2 Operating

2.2.1. **Pre-starting procedure**

To prepare the product for working you should:

- loosen the screw and remove the battery compartment cover no.3 (Pic. 2);
- install the batteries respecting polarities (Pic.3);
- place back the battery compartment cover and tighten the screw;
- fasten the measuring probe on the enclosure (should be threaded all the way).

2.2.2. Measuring procedure

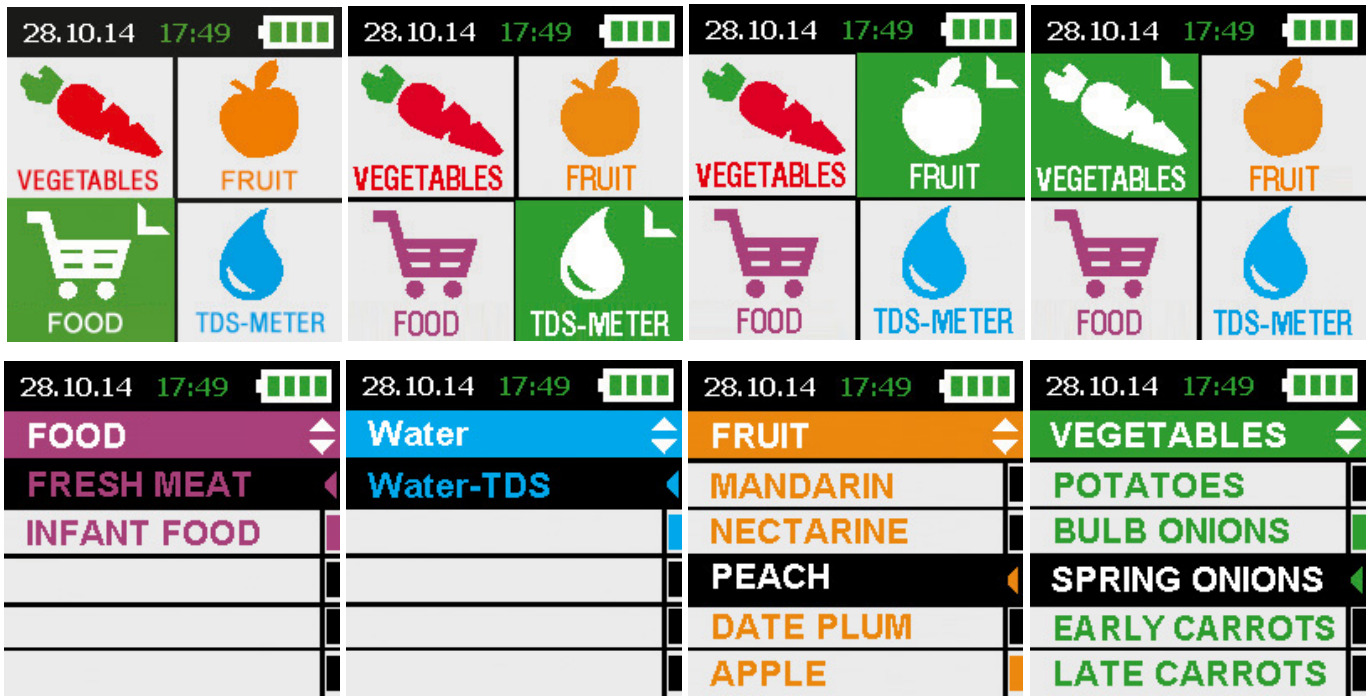
To switch the device on press the button and keep it pressed down for 2 seconds. When you do, you'll see the screen saver shown in Picture 4.


Picture 5 – Screen saver

The Food group selection window opens. The chosen food group flashes green (see Picture 5). Navigating through food groups and confirming the choice of a food group are performed by the button box .

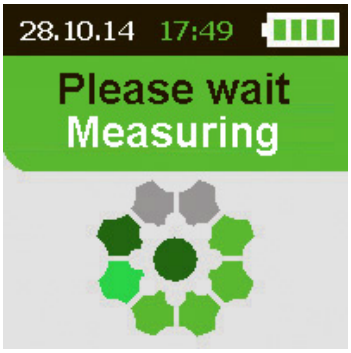

Picture 5 – Food group selection menu

Pressing the buttons or moves the user into one of the four food groups' menus (vegetables, fruits, foods, salimeter) (see Picture 6). For navigating through the list use the buttons (up/down arrows are for moving the cursor up and down in the list; left/right arrows are for navigating from page to page). Short-term pushing of the button returns you to the Food group selection menu (Pic. 5).



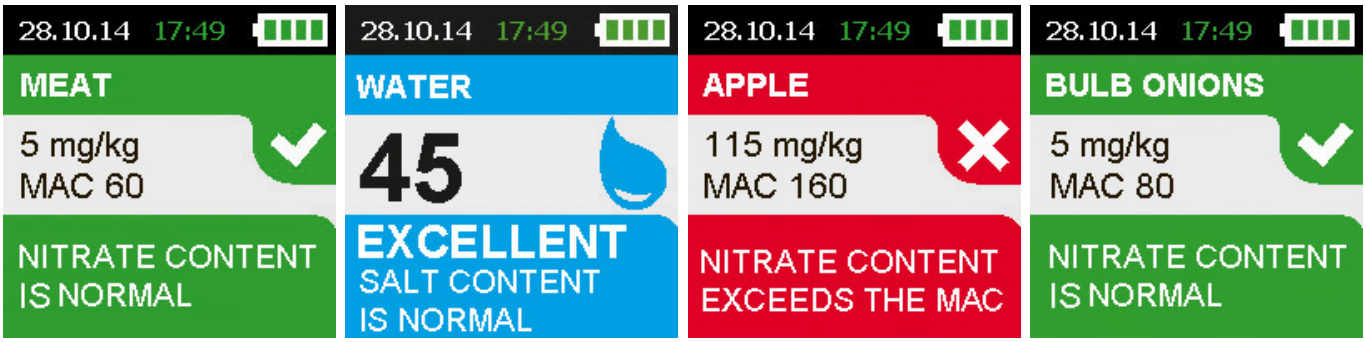

Picture 6 – Food group menu, food group's items list

After the food item has been selected (it's marked by black background, see Picture 6), you need to immerse the measuring probe into its flesh (or immerse it in water while measuring TDS) by two thirds of the measuring probe's length and press the button OK or . You'll see the animated performance of the measuring process on the screen (Picture 7).




Picture 7 – Measuring

After a few seconds the screen displays the nitrate concentration in the tested food item together with the maximum allowable concentration in mg/kg; for water it displays salt content and the water use recommendations (boil, put it through a filter, etc.) – see Picture 8.




Picture 8 – Results of measurement

**Attention!** After every measuring rub the measuring probe dry by a cotton napkin. Remains of vegetables, fruits and water may negatively affect the measuring accuracy!

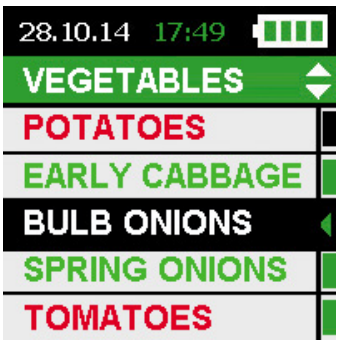
**Attention!** Avoid immersing the measuring probe's connecting thread into the flesh of vegetables and fruits or in water. It can lead to a short circuit and put the device out of operation! Optimal depth of measuring probe's immersion is 2/3 of its length.

2.2.3. History of testing

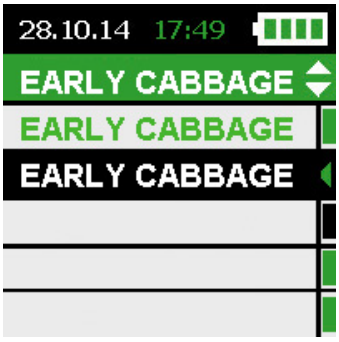
The product allows viewing the brief history of testing for food groups and for a certain food item (brief history) and displaying the total history of testing (total history).

2.2.3.1. Brief history

To display the brief history, choose the necessary food group or a food item by pressing the buttons  and press the button  briefly. The brief history of testing for a selected food group or for a selected food item will be displayed on the screen (see Pictures 9, 10).




Picture 9 – Brief history of testing for a selected food group (vegetables)

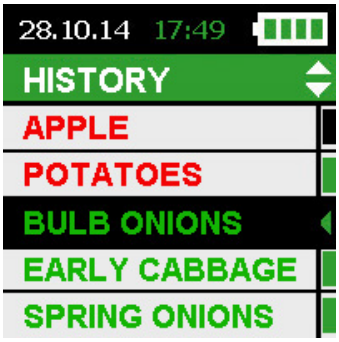



Picture 10 – Brief history of testing for a selected food item (early cabbage)

The results of measurement that show the exceeded concentrations of the maximum allowable concentration are highlighted in red.

2.2.3.2. Total history

To open the total history list press the button  and keep it pressed for more than 2 seconds. At that the total history list can be called up from food group menu or food group's items list. The total history list will be displayed on the screen (see Picture 11).

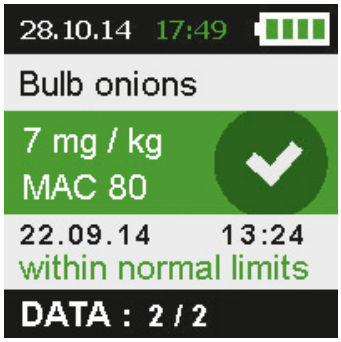



Picture 11 – Total history of testing

2.2.3.3. Navigating through the history of testing

For navigating through the history of testing use the buttons  (up/down – step by step, right/left – page by page). To view the results of measurement press the button  (Picture 12), to exit from the view of results to the history list press the button  or briefly press the button  .

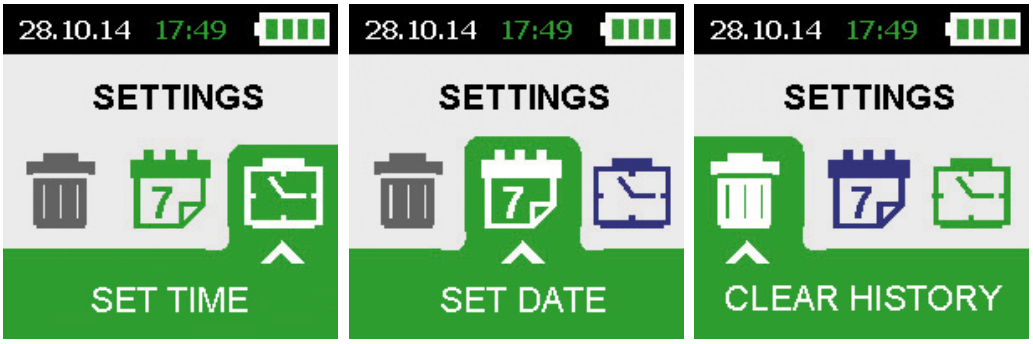
To return from the history list to the food group's items menu press the button briefly. You can also return to the food group menu by pressing the button . The button is always used to return from any menu to the food group list.




Picture 12 – View of results of measurement in history

2.2.4. Settings

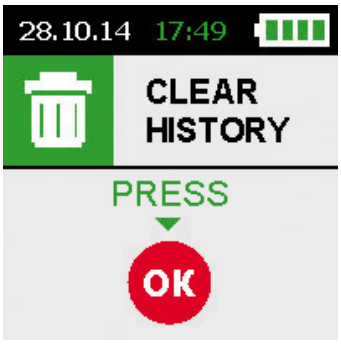
To open the Settings menu press the button . To navigate through the Setting menu use , and use the button to confirm the selection of a Setting menu item (see Picture 13). To exit the Setting menu press the buttons or .




Picture 13 – Settings

2.2.4.1. History clearing

To clear the history of testing enter the Settings - , choose the menu item "Clear the history" («ОЧИСТИТЬ ИСТОРИЮ») and confirm by pressing the button (see Picture 14). To cancel the history clearing press the button (exit to the Settings menu) or (exit to the Food group menu).




Picture 14 – History clearing

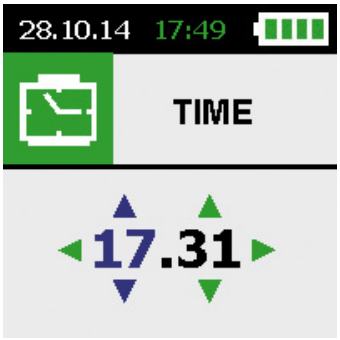
2.2.4.2. Date setting

To set the date you need to enter the Settings - , choose the menu item “SET DATE” («УСТАНОВИТЬ ДАТУ»), and confirm your choice by pressing the button OK. By pressing the buttons set day, month and year correctly and confirm your choice by pressing the button OK (see Picture 15). The device opens the Setting menu by doing so. To cancel time settings press the button (exit to the Settings menu) or (exit to the Food group menu).


Picture 15 – Date setting

2.2.4.3. Time setting

To set the time you need to enter the Settings - , choose the menu item “SET TIME” («УСТАНОВИТЬ ВРЕМЯ»), and confirm your choice by pressing the button OK. By pressing the button set hours and minutes correctly and confirm your choice by pressing the button OK (see Picture 16). The product goes to the Setting menu by doing so. To cancel time settings press the button (exit to the Settings menu) or (exit to the Food group menu).




Picture 16 – Time setting

**3. Technical service**

3.1. Keep the product clean and remove the dust by dry and clean flannel at times.

3.2. Protect the product from strokes and mechanical damage.

3.3. Using the product, check the batteries. If you see the runs of the battery acid, renew them.

3.4. After operating unthread the measuring probe from enclosure and rub it dry by a cotton napkin.

**4. Failure table**

Table 3 contains the troubleshooting information.

| Failure | Cause | Remedy |
|---|---|---|
| The product is turned on but there is no picture on the screen | Batteries are fully discharged | Renew batteries or charge accumulators |
| | Device is damaged | Device should be repaired |

Table 3

## 5. Package and transportation

Every product delivery set (see Table 2) is packaged in an individual container. Do not move the goods inside the package. Packaged products are put into the cargo corrugated containers according to the GOST 22637.

Packaged products can be transported by train or by trucks in covered trucks or containers or by air transport in pressurized modules.

While transporting the packaged products should be protected from the direct impact of atmospheric condensation and insolation.

Transportation terms and conditions:

- Environment temperature: from -50 to 50°C;

- Humidity at 25°C: below 95%;

- Atmospheric pressure: from 84 to 107 kPa (from 630 to 800 millimeters of mercury);

- Shock acceleration peak values: below 147 m/s2 (15 g), with shock acceleration duration 10…15 ms.

The requirements specified on the package warning labels must be strictly observed during loading and transportation.

## 6. Proof of acceptance

EcoLife PRO-2 nitrate meter TC 4215-008-6406207-2015

manufacturing number _____

manufacture date _____

is manufactured and accepted according to the valid technological documents and considered exploitable.

QC stamp _____

## 7. Manufacturer's warranty

7.1. Manufacturer warrants that the Product satisfies the technical requirements of the TC 4215-008-6406207-2015 while observing the operation, storage and transportation regulations indicated on exploitative documents.

7.2. The service life of the Product is not less than 5 years (with the average operation rate 4 hours per day).

7.3. The warranty period is 12 months from the date of sale. If the sale date and the vendor's stamp in the warranty card are absent the guaranteed use period will be calculated from the date of manufacture.

7.4. The supplier (manufacturer or a complete service provider) shall replace or repair the products broken down during the warranty period by and at the expense of the supplier.

7.5. This warranty shall be void if

- warranty period is over;
- operation, storage and transportation regulations are violated;
- the product put into service failed due to mechanical defects;
- the seal is broken.

7.6. When the warranty period ends, the maintenance of the Product will be provided at the expense of a Consumer.

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# Warranty card

Product name: EcoLife PRO-2 nitrate meter

Manufacturing number _____

Manufacture date _____

QC stamp _____

Sale Date _____

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Vendor’s stamp and signature _____

The customer does not have any claims on quality of the Product and the contents of delivery. The equipment is in good repair _____

*(Customer’s signature)*