DRAMIŃSKI
TECHNOLOGY

# TROL2

## Digital Agricultural Thermometer


USER MANUAL EN

ISO 9001 CE

# TABLE OF CONTENTS



EN

# INTRODUCTION

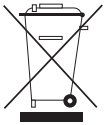
The **second generation** of **Dramiński** Digital Agricultural Thermometer **TROL** is a professional and useful tool for every modern farm. It will allow the user to quickly and thoroughly check the temperature of hay, grain, root vegetables and other crops during storage. The thermometer is equipped in a stainless steel probe allowing for easy measurement in stacks, piles, silos, etc. The probe with the reader is connected to the cable with the use of a solid screw-in connector, which eliminates the risk of accidental disconnection of the probe. **TROL2** is a response to the expectations of even the most demanding users who emphasised the importance of a modern agricultural thermometer having a large and backlit display, a possibility of independent updating, built-in memory enabling to store a large number of measurements, a special software for further analysis of the collected data on the computer and a possibility of cataloguing them against the probe from which the indication was read. Each **TROL2** measuring probe has its own and unique ID number, so we can assign each probe a different name and the reader will recognise which probe we use and record indications for that probe. With these features, we can permanently install the probes in the tested materials by assigning them different names, and then simply approach with the reader and store the indications in memory, which is very convenient (this solution maximises the measurement time, as when the probe remains in the tested material the whole time, it is not necessary to wait until it adopts the temperature of the material). **TROL2** also offers a possibility of cooperation with temperature probes of different designs and lengths, depending on user needs, while maintaining the highest accuracy without the necessity to calibrate the reader with the probe. The new thermometer model includes these features, as well as many other and thanks to the strength and working conditions to which it was developed, it has no equals on the market.

The manufacturer – **DRAMIŃSKI S.A.** serves the users with its knowledge and at the same time reserves the right to introduce changes and improvements in design and software. **DRAMIŃSKI S.A.** also reserves the right to amend the contents of the manual.

Read this manual carefully before starting the device. This will guarantee safe, long and reliable operation of the instrument.
The declaration of conformity of the device is available at the seat of **DRAMIŃSKI S.A.**
Wiktora Steffena 21, 11-036 Sząbruk, Poland.

**As a manufacturer, we provide warranty and post-warranty service in Poland.**

For more information and always up-to-date data please visit **www.draminski.pl**



**Please note** that electronic equipment, batteries and storage cells must not be disposed of in standard household waste containers. It is the user's responsibility to dispose of this type of waste to appropriate disposal companies in accordance with the applicable laws and regulations. By ensuring proper disposal, you help to protect the environment.

**see more**

# ACCESSORIES

SECTION 1

EN

**Dramiński TROL2**


**ACCESSORIES:**

1. Shipping packaging.
2. Electronic Agricultural Thermometer Dramiński **TROL2**.
3. Leash with a metal snap hook.
4. Operation manual.
5. 4 x 1.5 V batteries type AA, LR6.
6. USB – mini-USB cable for communication with a computer.
7. Measuring probe (probe model depending on customer choice).

# DESIGN OF THE DEVICE

SECTION 2

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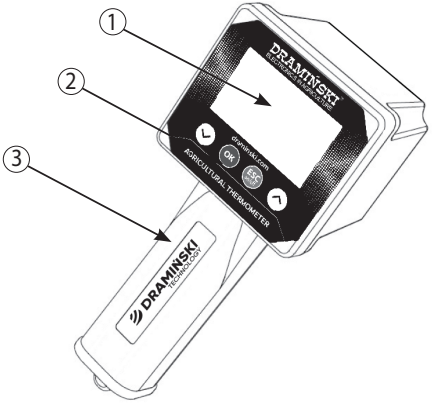
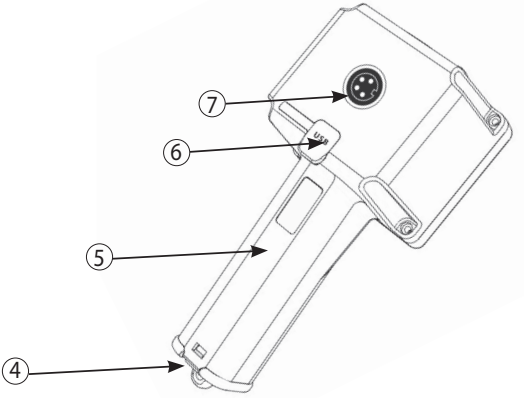
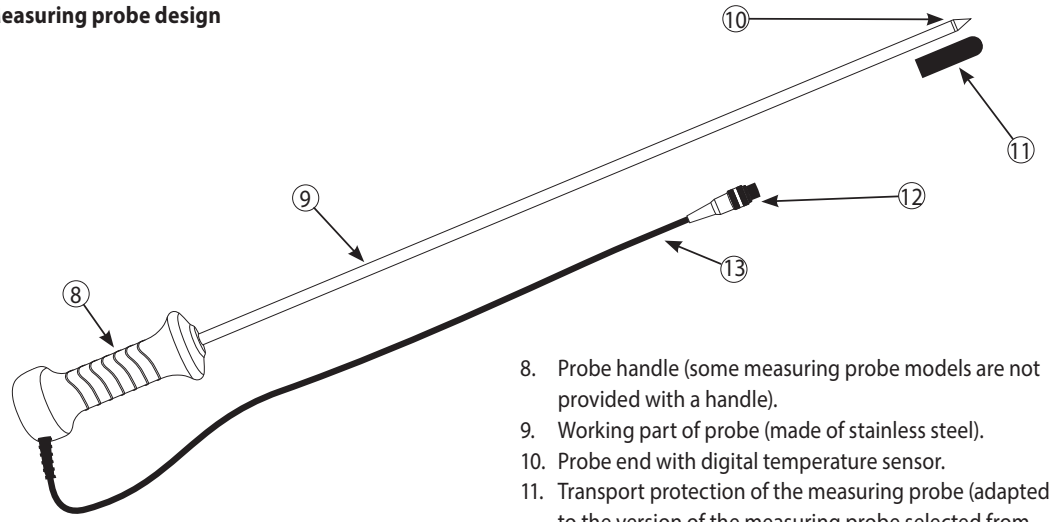
**EXTERNAL DESIGN TROL2**




1. Graphic LCD display with LED backlighting.
2. Membrane keyboard.
3. Housing made of high quality ABS.
4. Battery compartment cover.
5. Compartment for four 1.5 V AA LR6 type batteries.
6. Mini USB socket with rubber cover.
7. Socket for connecting the temperature probe.

**Measuring probe design**




8. Probe handle (some measuring probe models are not provided with a handle).
9. Working part of probe (made of stainless steel).
10. Probe end with digital temperature sensor.
11. Transport protection of the measuring probe (adapted to the version of the measuring probe selected from the product range).
12. Measuring probe plug.
13. Connecting cable.

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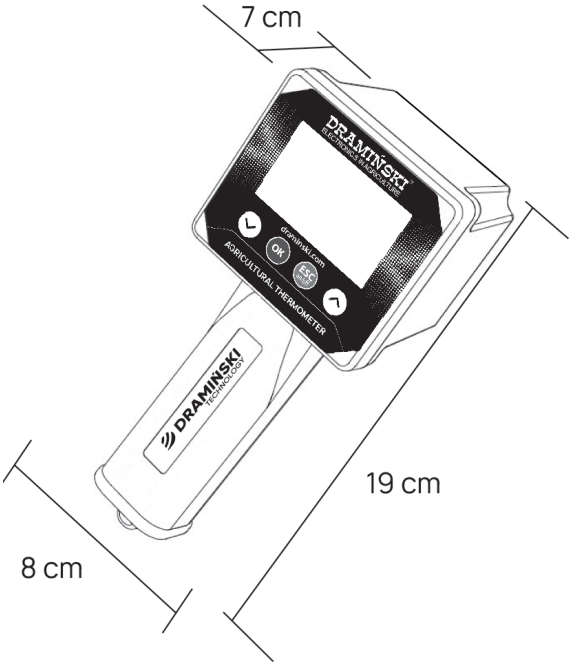
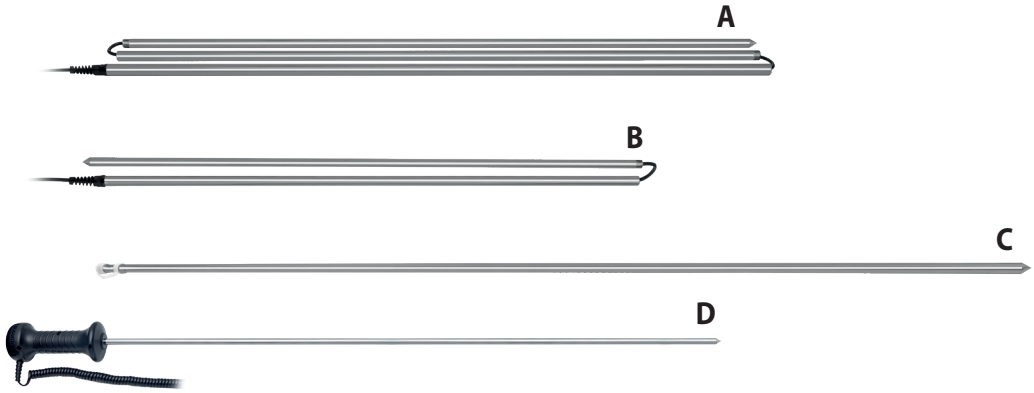
**APPROXIMATE DIMENSIONS TROL2**



**Available measuring probe models**




**A** – Folding probe 3.0 m
**B** – Folding probe 1.5 m
**C** – Non-folding probe 1.5 m
**D** – Non-folding probe 1.0 m (with handle)
* it is possible to order another dimension of the probe after consultation with Dramiński S.A.

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# KEYBOARD FUNCTIONS

SECTION 3

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| | |
|---|---|
| ESC on/off | – Turning on the device.<br>– Turning off the device by holding down the key for 5 seconds (NOTE! The thermometer can also be turned off via the menu by using the "Turn off!" option, and if not in use, it will automatically turn off to save batteries).<br>– Turning on the main menu.<br>– Canceling program functions. |
| OK | – Accepting program functions.<br>– Preview the mean, the lowest and the highest indication result. |
| ⌄ ⌃ | – Navigation through the menu.<br>– Setting values in menu options. |
| ⌄ | – Access to the option of saving the results and reset the mean result. |
| ⌃ | – Adding of indications to calculations of the mean result. |

# INSTRUMENT START-UP

SECTION 4

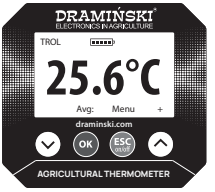
EN

Dramiński **TROL2** will be ready for use if the compartment includes properly inserted batteries (note polarity).

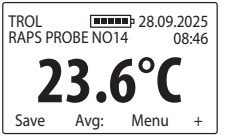
Switch on the device with the ESC on/off key.

a) A welcome message will appear on the display indicating the name of the device, the software version and the serial number.


b) The device will then enter the measuring mode. A model of the device and the current battery status will appear in the upper part of the display. The current temperature indication will appear in the middle part of the display (if the probe is not connected, the message "**Connect the probe**" will appear. The currently available menu functions appear in the lower part of the display over specific keyboard keys (e.g. to go to the main menu of the device, use the ESC on/off key).

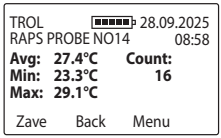


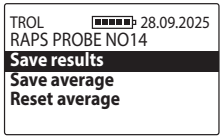

If the advanced operating mode is turned on in the device menu (see section 7: MAIN MENU), the following will also be visible on the display: name of the connected measuring probe, current date and time, "+" – it is possible to add an indication to the mean calculation, "**Mean**:" – preview of the mean result, "**Record**" – it is possible to record the indication in the memory.



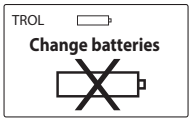

In the "**Mean**" option, it is possible to check the mean result, the number of results added to the mean calculation

and the lowest and highest indications. In the "**Record**" option, it is possible to record the current result, record the mean result and reset the mean result.



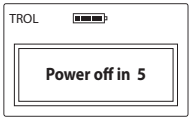

**Attention!** If the batteries are too weak to continue the work, the device will automatically signal this with a message:

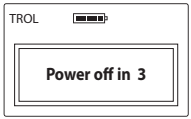



what means that the battery needs to be changed to new ones.

c) To save battery life when the keys are not in use, the device will pass into standby mode after a period of time, i.e. the backlight will turn off (this time can be changed in the menu). Press any key to return to the operating state..

d) If the device remains in standby mode for several minutes, the device will automatically turn off (this time can be set in the menu). The display will show a countdown from 10 to 0 which can be interrupted by any key, otherwise, the device will turn off in order to save power.




e) To turn off the device manually, hold down the ESC on/off key for 5 seconds or select the option "**Turn off**!" in the main menu.

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**ATTENTION!** Advanced mode users can download a special software for communication with a computer from our website **www.draminski.pl**, which allows for transfer of data from the device to the computer's hard drive to conveniently and accurately analyse results, archive data, save valuable notes, create special reports, printouts etc. from the results saved in the device's memory.

# MEASUREMENT NOTES

SECTION 5

EN

– When the device is switched on, the message "**No name found**" will appear if the advanced operating mode is active (see chapter 7: MAIN MENU) and the connected probe has not yet been assigned any name (or the probe is not connected to the reader). Only the probes added to the memory in the device menu (assigned with names) allow for using the results memorisation feature. When attempting to save an indication from the probe that has not yet been added "**Add a probe**" message will appear.

– If the advanced operating mode is set, and when the device is switched on, the message "**Set date**" will appear, meaning that the clock has been reset (e.g. during changing of batteries) and it must be set again, so that the saved measurements can be cataloged properly.

– If the "**Connect the probe**" message appears on the display despite the fact that the probe is connected to the reader, this may indicate an incorrect connection of the probe plug to the reader or a damage to the probe.

– During measurements wait until the indications are stable, which means that the probe has already adopted the temperature of the tested material and the result can be considered final. Stabilisation time depends on the design of the probe, the structure of the tested material and the temperature difference, i.e. if, for example, the probe has been heavily exposed to the sun and then a colder material will be tested, the temperature reading time may increase.

– Exceeding of the measurement range is marked with the "**MIN**" message (for indications below the range) and "**MAX**" (for indications above the range).

# MEASUREMENTS

SECTION 6

EN

**Temperature measurement:**

1. Switch on the device and check the display for sufficient battery charge.

2. Place the measuring probe in the tested material. The temperature sensor is located at the end of the probe (in the tapered tip), so as to facilitate and speed up the reading, it is at least necessary to ensure that this portion of the probe is covered with the tested material (at least 5 cm).

3. Connect the probe to the reader paying attention to the plug shape, which is designed to prevent wrong connection to the socket located on the reader enclosure (the probe may also be connected before the reader is switched on).

4. Screw in the metal connector lock to prevent accidental disconnection.

5. When the probe is connected, the message "**Wait!**" will appear to indicate that the temperature sensor has been activated. After a few seconds, the temperature result will appear (reading refreshes every 2 seconds).

6. The reading may change during the measurement, which is the result of the process of adopting the temperature of the tested material by the probe. Therefore, the final result is assumed to be the value visible after stabilization.

7. The results of the measurements can be added to the mean calculation using the (^) key.

8. To check the mean result, the number of measurements from which it was calculated and the lowest and highest indications, use the (OK) key.

9. If the advanced operating mode is turned on (see section 7: MAIN MENU) and the probe you are using has

already been added to the memory, you can use the ⌄ key to save the current results and the obtained mean value. Before saving, make sure that the clock located in the upper right corner of the display is set correctly.

10. The recorded measurements will be assigned to a given temperature probe and the name assigned to it. This makes it convenient to view the results in the device menu and upload them to your computer to use the advanced functions to analyse the data collected with special software (the software is free-to-use and available for download on the **www.draminski.pl** website).

**Attention:** The time needed to stabilise the result depends on the tested material, its structure and the temperature difference between the probe and the tested material. Before starting the tests, we recommend to carefully read the operating instructions (especially sections 2, 4, 5, 7 and 9). If you have any questions or concerns, please do not hesitate to contact us.

# MAIN MENU

SECTION 7

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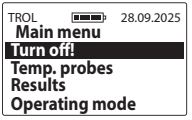
Thanks to the functions contained in the main menu of the device, the user can quickly turn off the device, adjust operational settings to their needs, manage memory and much more.

**To turn on the MAIN MENU, press the (ESC on/off) key**.

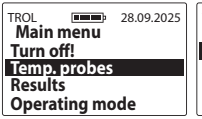
1. **Turn off!**

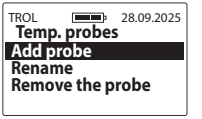
To turn off the device, go to the Main menu using the (ESC on/off) key ,then use the (∨) or (∧) key to select the "**Turn off!**" option and confirm with (OK) key.



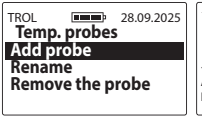

Thanks to this function, the user can quickly and conveniently turn off the device without the necessity to hold down the (ESC on/off) key for 5 seconds and wait for the power auto off option to activate.

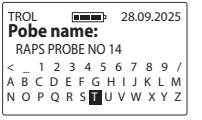
2. **Temperature probes**




a) **Add a probe** – to add a new probe to the device's memory, go to **Main menu / Temperature probes / Add a probe**, and then enter any name by selecting characters using the arrows and confirming with the (OK) key (to clear the character select the "<" symbol and press the (OK) key). When the name is entered, press the (ESC on/off) key and when the "**Save the name?**" message appears, confirm with the (OK) key or cancel with the (ESC on/off) key, e.g.

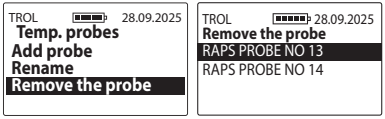



b) **Rename** – to rename the probe for which the results will be put into the directory, go to Main menu / Tem-

perature probes/ Rename, then use the (v) key or (^) key to select the appropriate probe from the list and confirm with the (OK) key. In the next step enter the new name by selecting characters using the arrows and confirming with the (OK) key (to clear the character select the "<" symbol and press the (OK) key). When the name is entered, press the (ESC on/off) key a and when the "**Save the name?**" message appears, confirm with the (OK) key or cancel with the (ESC on/off) key, e.g.


c) **Delete a probe** – to delete a probe from the device's memory, together with the measurements saved for it, go to **Main menu / Temperature probes / Delete a probe**, then select the appropriate probe from the list and confirm with the (OK) key or cancel with the (ESC on/off) key (Note! the probe and its measurements will be irreversibly deleted from the device, therefore if the data is important, remember to first transfer it to the computer using special software), e.g.




3. **Results**

To view the results saved in the device's memory, go to **Main menu / Results** and then select the appropriate probe using the (v) key or (^) key and confirm with the (OK) key (the results are arranged chronologically starting with the most recent ones). You can also delete individual results. To do this, use the arrows to indicate the result you would like to delete and use the (OK) key, and when the "**Delete?**" message appears, confirm with the (OK) key or cancel with the (ESC on/off) key, e.g.

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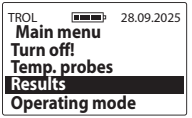
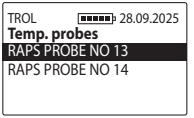
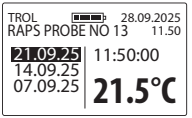
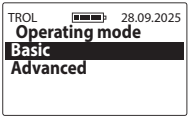


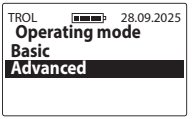




4. **Operating mode**

a) **Basic** – in order to facilitate the operation of the device and use only the basic menu functions, go to **Main menu / Operating mode**, then using the ⌄ or ⌃ key select the Basic option and confirm with the OK key, e.g.

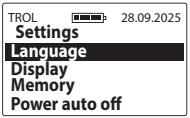

b) **Advanced** – in order to enable all the options of the device such as real time clock, saving measurements, etc. go to **Main menu / Operating mode**, then using the ⌄ or ⌃ key select the Advanced option and confirm with the OK key, e.g.


5. **Settings**

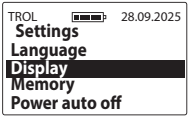

5.1 **Language**

To change the language version of the device, go to Main menu / Settings / Language, then select the language version using the ⌄ or ⌃ key and confirm with the OK key, e.g.

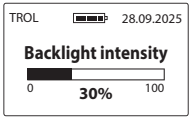




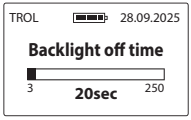
5.2 **Display screen**




5.2 a) **Backlight intensity** – we used energy-saving LED backlighting but remember that stronger backlighting is associated with increased power consumption, which leads to a faster discharge of the battery. To change the backlight intensity, go to **Main menu / Settings / Display / Backlight** intensity, then select the appropriate value using the ⌄ or ⌃ key and confirm with the OK key, e.g.


5.2 b) **Backlight off time** – adjustment of the time after which the backlight of the display is off and the device goes into the idle state waiting for the keyboard to be used again (the time is counted from the last click/use of the key on the keyboard of the device). To change the backlight off time, go to **Main menu / Settings / Display / Backlight off time**, then select the appropriate value using the ⌄ or ⌃ key and confirm with the OK, e.g.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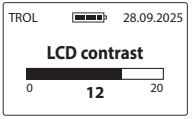
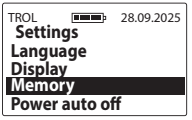
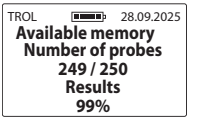
5.2 c) **LCD contrast** – to change the contrast of the LCD display, go to **Main menu / Settings / Display / LCD contrast**, then select the appropriate value using the ⌄ or ⌃ key and confirm with the OK key, e.g.


5.3 **Memory**




5.3 a) **Available memory** – to check the current amount of free space in the device's memory, go to **Main menu / Settings / Memory**, use the ⌄ or ⌃ key to select the **Available memory** option and confirm with the OK key, e.g.

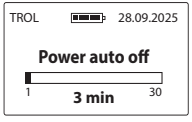

5.3 b) **Delete temperature results** – to delete all results stored in the device's memory, go to the **Main menu / Settings / Delete temperature results**, and confirm with the OK key. This option deletes the results from all probes saved in the device (the probes will not be deleted). **Note!** Examination results will be irretrievably deleted from the device, so if the data is important, remember to first transfer it to the computer using special software.


5.3 c) **Erasing memory** – to erase the entire device memory (all results and probes), go to Main menu / Set-

tings / Memory / Erasing memory and confirm with (OK) key. **Note!** the data will be irretrievably deleted from the device, so if the data is important, remember to first transfer it to the computer using special software.

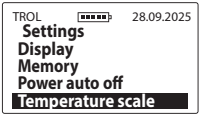

## 5.4 **Power auto off**

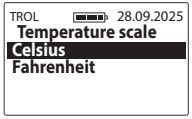
Adjustment of the time after which the device turns off automatically counting from the last click/use of the keyboard. To change the power auto off time, go to Main menu / Settings / Power auto off, then select the appropriate value using the (v) or (^) key and confirm with the (OK) key, e.g.


## 5.5 **Temperature scale**

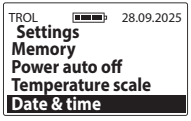
To change the temperature scale from Celsius to Fahrenheit or vice-versa, go to **Main menu / Settings / Temperature scale**, then select the appropriate scale using the (v) or (^) key and confirm with the (OK) key e.g:




## 5.6 **Date and time**

The device has a real time clock so that the measurement results are saved in memory together with the actual date and time of performance.

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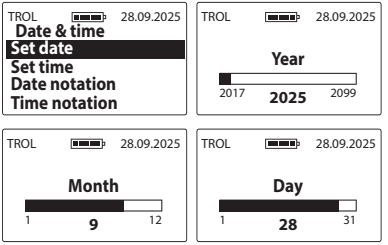
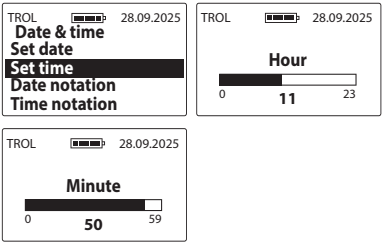
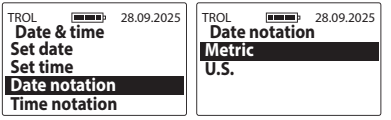
5.6 a) **Set date** – to set the current date, go to **Main menu / Settings / Date & time / Set date**, then use the ⌄ or ⌃ key to select the appropriate value and press the OK key to confirm the year/ month/day, e.g.




5.6 b) **Set time** – to set the current time, go to **Main menu / Settings / Date & time / Set time**, then use the ⌄ or ⌃ key to select the appropriate value and press the OK key to confirm the hour/minute, e.g.

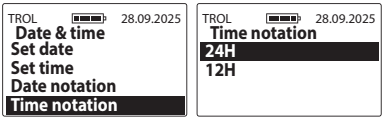



5.6 c) **Date notation** – to change the format of time display, go to **Main menu / Settings / Date & time / Time notation**, then use the ⌄ or ⌃ key to select the appropriate option and confirm with the OK key, e.g.




5.6 d) **Time notation** – to change the format of time display, go to Main menu / Settings / Date & time / Time notation, then use the ⌄ or ⌃ key to

select the appropriate option and confirm with the (OK) key, e.g.




6. **About**

To check the device information and manufacturer's contact details, go to the Main menu using the (ESC on/off) key, then use the (v) or (^) key to select the About option and confirm with the (OK) key.

Here we can conveniently check e.g. model of the device, software version, serial number of the device as well as the address and contact details of Dramiński S.A. on page 2 e.g.


**DRAMIŃSKI S.A.**
ul. Wiktora Steffena 21
11-036 Sząbruk, Polska
e-mail: dm@draminski.com
phone: +48 89 675 26 00
MADE IN POLAND

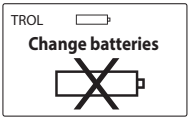
EN

# CHANGING BATTERIES

SECTION 8

EN

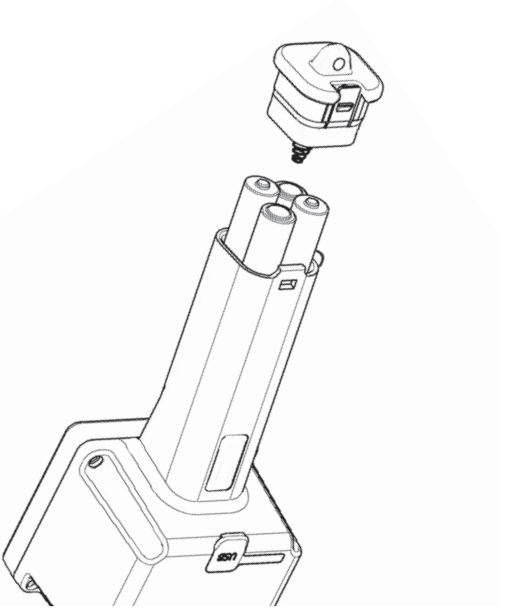
The device features an automatic indication that the battery is discharged. In this case, the "**Change batteries**" message in the form of a graphic symbol will be displayed immediately after turning on or during use and the device will automatically turn off.




The device is powered by four standard 1.5 V AA type batteries (commonly known as Mignons).

**To change batteries:**

– press the lock lever of the battery compartment cover,
– remove the cover from the battery compartment,
– remove used batteries and insert a new battery pack according to the polarity markings +/-,
– press the battery compartment cover until you hear a clearly audible click,
– check whether the cover has latched properly into the container to make sure that it does not slip out.



# FINAL REMARKS

SECTION 9

EN

– The housing can be cleaned with a wet cloth using detergents. Do not use very hot water or boiling water during washing. Extreme care shall be taken not to soak the socket used to connect the temperature probe.

– Please store the device in dry conditions at room temperature.

– Remember to install a rubber cover for the USB socket and the battery cover to minimise the risk of dirt and moisture.

– If the device is not going to be used for a longer period of time, we recommend to remove the batteries from the battery compartment of the device to reduce the risk of damage resulting from electrolyte leakage. We recommend using good quality batteries.

– In case of problems with the device or difficulties in performing the measurements, we recommend (before sending the device for service) contacting the manufacturer, i.e. DRAMIŃSKI S.A.

– DRAMIŃSKI S.A. requests to send any comments and inform us about the results of using the device. Customer contact is very valuable for us in developing and improving your equipment.

– It is forbidden to unscrew the display window, interfere with it or have it serviced by unauthorised persons, as this may cause unsealing of the device, permanent damage and will affect the warranty conditions.

– If the message "**Probe already stored**" appears when attempting to add a probe, this means that a given temperature probe has already been added to the memory. In this case, you can rename it or remove it from memory and add it again (Note: Removal of the probe also means deleting of the results already stored in the device memory).

# TECHNICAL SPECIFICATION

SECTION 10

EN

| | |
|---|---|
| **Approximate reader weight (with batteries)** | 330 g |
| **Probe weight (depending on the model)** | 1,0 m non-folding – 510 g<br>1,5 m folding – 770 g,<br>1,5 m non-folding – 850 g<br>3,0 m folding – 1760 g |
| **Approximate dimensions** | reader: 19 x 8 x 7 cm<br>measuring probes: 1,0 m / 1,5 m / 3,0 m (depending on the model) |
| **Cable length** | 1,5 m |
| **Power supply** | four 1.5 V AA type batteries (LR6) |
| **Battery status indication** | graphic |
| **Battery low indication** | automatic |
| **Power consumption** | from 11 mA to 54 mA (depending on the set backlight intensity) |
| **Measurement control** | single chip microcomputer |
| **Estimated continuous working time on one alkaline battery pack** | 209 hours when backlight is set to 0%<br>95 hours when backlight is set to 30% |
| **Display screen** | LCD display with LED backlighting, diagonal 2.4″ |
| **Keyboard** | membrane |
| **Data transmission** | via USB |
| **Update** | via USB |
| **How to save data** | internal memory |

| | |
|---|---|
| **Memory capacity** | 250 names of temperature probes (automatically recognised with the probe ID number). 1.1 million measurements with date and time<br>20 language versions |
| **Memory status check** | from menu entry |
| **Available units** | °C / °F |
| **Measuring range** | from -55°C to +125°C / from -67°F to +257°F |
| **Measurement resolution** | 0,1 °C / °F |
| **Sampling** | every 2 seconds |
| **Measurement accuracy** | ± 0.5°C within the range from 0°C to 85°C/± 0.9°F within the range from 32°F to 185°F |
| **Works with multiple probes without any calibration necessary** | yes |
| **Limitations on the number of probes working with the reader** | none |
| **Possibility of disconnecting/replacing the measuring probe** | yes |
| **Need for periodic calibration** | no |
| **Temperature sensor** | digital |
| **Measurement method** | contact (touch) |
| **Connector type** | screwed-in, metal |

| | |
|---|---|
| **Additional functions** | real time clock, LED backlighting, pop-up menu, saving the results, automatic identification of the connected probe, software for data transmission and analysis (reports, graphs, printouts, archiving), independent software update, change of the temperature scale |
| **Recommended operating temperature** | from 10°C to 40°C |
| **Recommended storage temperature** | from 5°C to 45°C |
| **Place of manufacture** | Poland |
| **Manufacturer** | Dramiński S.A. |
| **EAN codes** | Electronic Agricultural Thermometer **TROL2** – 5906874410516<br>1.0 m probe, non-folding – 5906874410554<br>1.5 m probe, folding – 5906874410530<br>1.5 m probe, non-folding – 5906874410523<br>3.0 m probe, folding – 5906874410547 |

# WARRANTY

SECTION 11

EN

The manufacturer gives a 24-month warranty counting from the date of purchase and guarantees trouble-free operation of the device used in accordance with this manual. The warranty period and the terms and conditions for its coverage may vary depending on the offer or promotion specified by the manufacturer as of the date of purchase of the equipment.

In case of a technical defect, which was not caused by the user, the manufacturer is obliged to repair the delivered device within no more than 14 business days from the date of delivery of the device to the service centre (Wiktora Steffena 21, 11-036 Ząbruk, Poland) and send back the operational device to the user at the manufacturer's cost.

The warranty does not cover mechanical damage, damage caused by improper use, storage and self-made repairs. Sending a technically efficient device to the guarantee service may involve the calculation of inspection fee, so please contact us before sending the package because most problems can be resolved remotely.

The warranty is honoured on the basis of a proof of purchase.

**In order to submit a warranty claim, please:**

1. Notify DRAMIŃSKI S.A. about the equipment failure immediately after its occurrence.
2. Send the device or deliver it personally to the Service address (not later than before the warranty expiry date), together with the proof of purchase, which should specify the details of the seller and buyer, date and place of purchase, the name of the device and its serial number.
3. The device handed over to the Service shall be accompanied by a defect description in order to effectively diagnose the failure and repair it.

* Please pay particular attention during packaging to secure the equipment thoroughly as the manufacturer is not liable for damage caused during transport

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**The warranty is provided by**
**DRAMIŃSKI S.A.**
Wiktora Steffena 21, 11-036 Ząbruk, Poland
phone +48 89 675 26 00
e-mail: serwis@draminski.com
**www.draminski.com**

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