DRAMIŃSKI
TECHNOLOGY

GRAIN MOISTURE AND DENSITY METER

(GMDM type WZW-2)

Grain moisture and density meter with an integrated scale

MANUAL EN

ISO 9001 | CE

CONTENT

EN

INTRODUCTION

Thank you for purchasing our new **Dramiński Grain Moisture and Density Meter** (DMDM2). This perfect product will be irreplaceable device in your activity. Due to its special design (and pressing the sample before the measurement), you will accurately determine your grain humidity.

Innovative solutions, state-of-the-art technology, vast versatility, USB connection and a possibility to connect an external temperature probe change the purchase of your TG pro into a priceless investment. We wish you fruitful harvests and pleasant work with the intelligent Draminski Twist Grain pro grain moisture meter.

The manufacturer DRAMINSKI S.A. is always ready to support their users with their knowledge and simultaneously reserves the right to introduce changes and improvements to the design and the software. DRAMINSKI S.A. also reserves the right to introduce changes to the present instruction manual.

Before using the device, please, read this instruction manual carefully. It will guarantee safety for the user and long, reliable functioning of the grain moisture meter.

Declaration of conformity is located at the head office of DRAMINSKI S.A., Wiktora Steffena 21, Sąbruk, 11-036 Gietrzwałd, Poland.

More information and current data you will find at

www.draminski.com

We would like to remind that electronic devices, batteries and accumulators cannot be thrown away into common domestic waste containers. The user is responsible to handover these types of waste to companies which deal with such utilization in accordance with the applicable legal provisions. By assuring proper utilization you help protect natural environment.

EQUIPMENT

CHAPTER 1

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EQUIPMENT:

1. Dramiński GMDM2 grain moisture and desity meter,
2. Instruction manual,
3. Transport case,
4. Dosage tube,
5. USB cable used to communicate with the computer.

The display and functional keyboard are located on the top of the device's housing. The measuring chamber, located above the display, is where grain is poured to determine the sample's moisture content. A sensor is built into the bottom of the measuring chamber – its function is to measure and compensate for temperature.

The device is housed in a carrying case made of a special material that is resistant to weather conditions and most chemicals, and is easy to clean.

CONSTRUCTION OF THE DEVICE

CHAPTER 2

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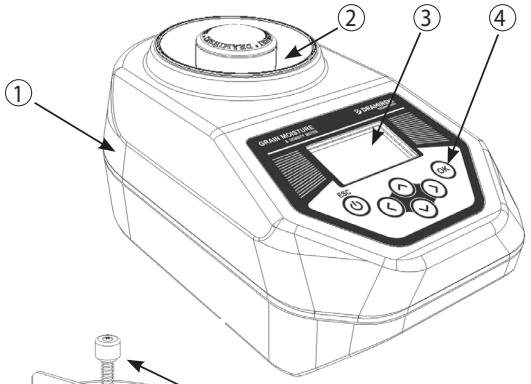
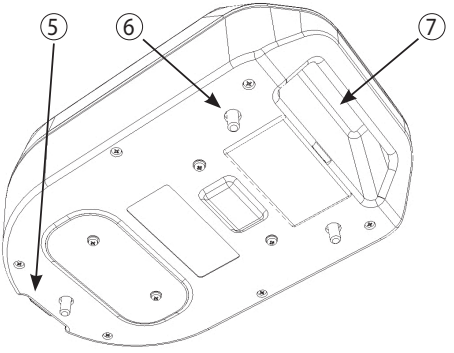
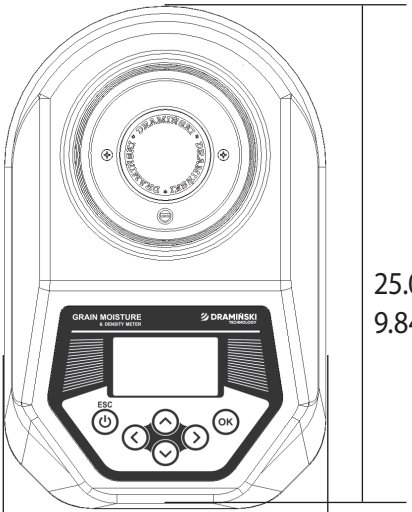
CONSTRUCTION OF THE DEVICE

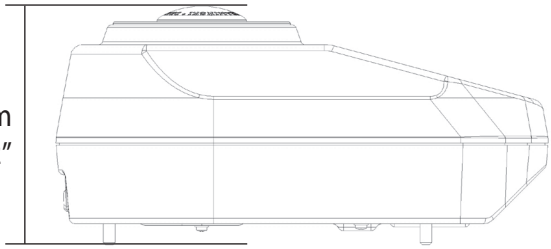


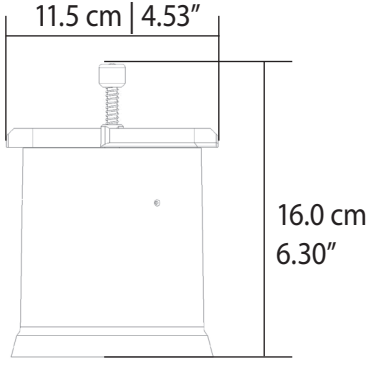


1. High-quality ABS housing,
2. measuring chamber with digital temperature sensor,
3. graphic LCD display with LED backlight,
4. membrane keyboard,
5. USB-C port with cover,
6. scale feet,
7. handle,
8. dispenser trigger,
9. scraper blade,
10. dispenser housing.

APPROXIMATE DIMENSIONS







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KEYBOARD FUNCTIONS

CHAPTER 3

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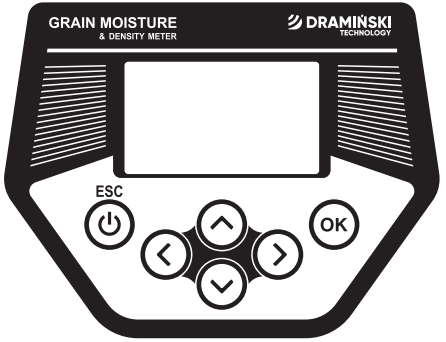


ESC	– Turning the device on and off after use. (***Note: The device will automatically turn off if no buttons are pressed for 3 minutes.***) – Cancelling a previously performed operation (e.g., switching from measuring one grain type to measuring another)
OK	– Starting the measurement – Confirming the selected grain name – Confirming the menu options
	– Save result / save average / reset average
	– Printout

	– Selecting the species / navigating the menu / during measurement – displays moisture, density, weight, average moisture and average density
	– Selecting a genre / navigating the menu / displaying a list of suppliers

HOW TO START THE DEVICE

CHAPTER 4

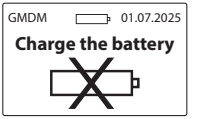
EN

Turn on the device with the ESC button.

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

b) The device will then enter measurement mode. The top of the display will show the device model (GMDM2), the current battery charge status, and a list of species with the most recently selected species highlighted.

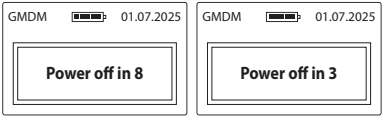
Note: If the battery is low, the device will automatically notify you with a message:



This means the charger must be connected.

c) To save energy, after a certain period of time, when the keys are not used, the device will enter standby mode, which means the backlight will turn off (this time can be adjusted in the menu). Pressing any key will restore the backlight and activate the selected option.

d) If the moisture meter remains in standby mode for several minutes, it will automatically shut off (this time can be adjusted in the menu). The display will count down from 10 to 0, which can be interrupted by pressing any key. If this is not done, the device will automatically turn off to conserve power.



e) To turn off the device yourself, hold down the ESC button for 5 seconds or confirm the **„Turn off!"** option from the main menu.

NOTE! Those using advanced mode can download a special computer communication program from our website www.draminski.pl, which allows you to download data from the device to your computer's hard drive for convenient and accurate analysis of results, archiving data, recording valuable notes, creating special reports and printouts of results stored in the device's memory, etc.

SPECIES AND MEASUREMENT RANGES

CHAPTER 5

EN

List of species and measurement ranges:

Rapeseed	4.0% – 20.0%
Rye	9.0% – 24.0%
Common wheat	9.0% – 24.0%
High-quality wheat	9.0% – 24.0%
Trialite	9.0% – 24.0%
Spring barley	9.0% – 24.0%
Oats	9.0% – 24.0%
Corn	9.0% – 24.0%

Measurement ranges shift slightly depending on the temperature displayed by the device.

To add an additional species to your GMDMv2, please contact us:
e-mail: agri@draminski.com
tel: +48 89 675 26 00

The most up-to-date list of all available species is available on www.draminski.com under the tab „**product/moisture-meter-gmdm2/**."

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MEASUREMENTS

CHAPTER 6

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NOTE! Before starting the measurement, the meter should be placed on a level, hard, smooth, and stable surface (such as a desk or table).

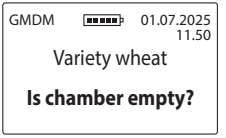
Before starting the measurement, check that the measurement chamber is empty. Then, place the empty dispenser over the empty chamber (this is necessary to check the input parameters, i.e., prepare for the actual measurement).

To measure grain moisture:

a) Turn the device on using the ESC button. After a short welcome message, a list of available species will appear. GMDMv2 will always highlight the name of the last tested species, e.g.:

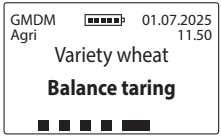
b) Use the ^ or v arrow buttons to select the species you currently want to test, and then confirm with the OK button.

c) After selecting the species, the device will ask if the measurement chamber is empty and will display the current date and time, e.g.:



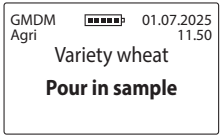
At this point, make sure the measuring chamber is actually empty and clean. Then, place an empty dispenser on the device and confirm by pressing the OK button.

Pressing the green OK ubutton will start the measurement process, starting with defining the input parameters (including taring the scale) – the following message will appear on the display:



During this time, do not touch the device to avoid interfering with the taring process.

After a few seconds of taring, indicated by a progress bar on the display, another message will appear:



The sample is poured into the chamber using a special dispenser.

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After taring, remove the dispenser from the device and fill it with the excess grain being tested. Then, scrape off the excess grain using a special propeller, slowly rotating it until the surface is flush with the top edge of the dispenser.

The sample being tested should be properly collected and cleaned. Carefully measuring the amount of grain in the dispenser will contribute to accurate results.

NOTE! If taring is incorrect (e.g. without an EMPTY dispenser placed or with a FILLED dispenser placed on the moisture meter) or an incorrect amount of grain is measured, the measurement attempt will end with the message: **„sample too light"** or **„sample too heavy".**

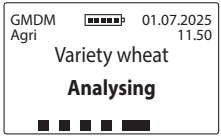
Once the grain dispenser is ready, place it carefully on the device – above the measuring chamber.

Once the dispenser is placed on the device, simply press the trigger firmly and hold it until the entire sample slides into the measuring chamber. Then release the trigger.

Remember, the dispenser must remain on the device until the result appears on the display.

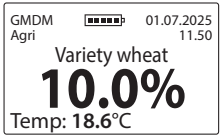
The device will recognize that the chamber has been filled with the sample and a message will appear, e.g.:

Then, after pressing this button, the sample measurement will start, which will be confirmed by the message on the display:

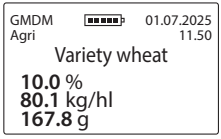


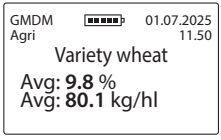
This message lasts a few seconds – during this time, the sample is being measured. Therefore, do not touch the device and ensure that the device and the surface on which it is placed are not exposed to any shocks.

After the measurement, a message with the obtained results will be displayed.



In addition to the sample's moisture content, you can also read the temperature recorded by the sensor located in the measuring chamber. Pressing the ⌃ button displays the average moisture content from a pre-set number of measurements, as well as the sample's mass and calculated test weight (given in units as set in the menu – kg/hl, kg/m^3, kg/l, g/cm^3) as additional parameters.





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After the measurement is completed and the results are read, the dispenser can be removed from the device and the sample removed from the chamber (the device is quite heavy, so it is best to hold it with both hands when pouring the sample out of it).

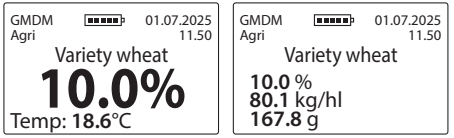
Note: To repeat the measurement for the same sample, empty the chamber, place the empty dispenser on the device and press the OK button.

PRINTING RESULTS

CHAPTER 7

EN

As previously described, in addition to the sample's moisture content, you can also read the temperature recorded by the sensor located in the measuring chamber. Pressing the ⌒ button displays the average moisture content from a set number of measurements, as well as the sample's weight and calculated test weight.



The measurement results displayed on the screen can also be printed on a dedicated printer that communicates wirelessly with the meter via Bluetooth.

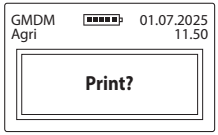
We recommend the OCPP-80G printer from OCOM because it is very easy to use, durable, and cost-effective.

Printing will be possible after pairing the devices, which requires a few simple steps.
Adding or removing a printer is described in the **MAIN MENU section, point 6 Printers**.

If a printer has been added and selected, it will be available for printing results from the meter until further notice.

PRINTING RESULTS

To do this, use the arrow keys to select the result you would like to print and press the (›) key to print it. When the **„Print?"** message appears, confirm with (OK) or cancel with (ESC on/off), e.g.



The final result of the printout is a receipt with the following data:

* The printer is an additional EQUIPMENT and is not included in the standard set.

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MAIN MENU

CHAPTER 8

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

To activate the Main Menu, press and hold the ON/OFF (ESC) button for approximately 2 seconds.

1. **Turn off!**

To turn off the device, enter the **Main menu** using the (ESC), key, then use the (⌄) or (⌃) keys to select the **Turn off!** option and confirm with the (OK) key.

Thanks to this function, the user can quickly and conveniently turn off the device without having to hold the (ESC) key for 5 seconds and without waiting for the automatic shutdown option to work.

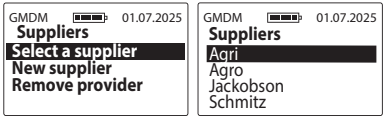
2. **Species list**

To return to the species list from the Main Menu, press the (ESC) key or use the arrow keys to select the Species List option and confirm with the (OK) key.

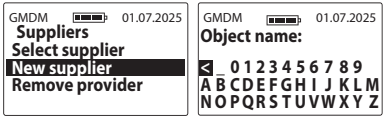
Then select the desired genre and confirm with the (OK) button.

3. **Suppliers**

a) **Select supplier** – to select the supplier for which the results will be catalogued, go to **Main Menu / Suppliers / Select supplier**, then use the ⌄ or ⌃ keys to select the appropriate supplier from the list and confirm your selection with the OK, key, e.g.



b) **New supplier** – to add a new supplier to the device's memory, go to **Main Menu / Suppliers / New supplier**, then enter any name by selecting characters using the arrows and confirming with the OK key (to delete a character, select the „<" symbol and confirm with the OK key). When the name is entered, press the ESC key and when the message **„Save name?"** appears, confirm with the OK key or cancel with the ESC key, e.g.



c) **Remove Supplier** – to delete a given supplier from the device's memory along with the measurements saved for him, go to **Main Menu / Suppliers / Remove Supplier**, then select the appropriate supplier from the list and confirm with the OK key or cancel with the ESC key (Attention! The supplier and his MEASUREMENTS will be irreversibly deleted from the device, so if the data is important, remember to first transfer it to a computer using special software), e.g.

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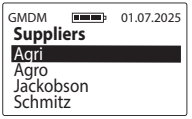
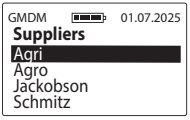
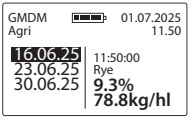
4. **Results**

To view the results saved in the device's memory, go to **Main Menu / Results** and then scroll through them using the ⌄ or ⌃ key (the results are arranged chronologically, starting with the newest), e.g.



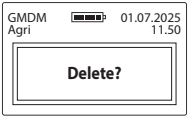




While viewing the results, you can also print or delete individual results.

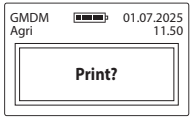
a) **Deleting results**

To do this, use the arrow keys to select the result you wish to delete and press the OK key to delete it. When the **„Delete?"** message appears, confirm with the OK key or cancel with the ESC key, e.g.



b) **Printing results**

To do this, use the arrow keys to select the result you'd like to print and press the › key to print it. When the **„Print?"** message appears, confirm with OK or cancel with ESC, e.g.



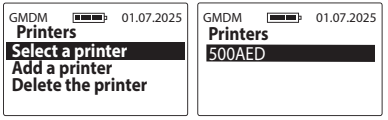
5. **Operating mode**

a) **Basic** – to facilitate the operation of the device and use only the basic menu functions, enter **Main Menu / Operation Mode**, then use ⌄ or ⌃ to select the **Basic** option and confirm with the OK button, e.g.

b) **Advanced** – to enable all the device features such as the real-time clock, saving measurements, etc., enter the **Main Menu / Operating Mode**, then use ⌄ or ⌃ to select the **Advanced** option and confirm with the OK button, e.g.

6. **Printers**

a) **Select printer** – to select a printer, go to **Main Menu / Printers / Select printer**, then use the ⌄ or ⌃ keys to select the appropriate printer from the list and confirm your selection with the OK key, e.g.



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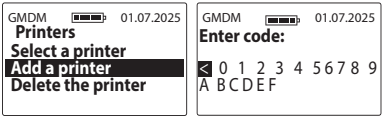
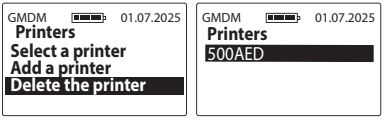
b) **Add printer** – to add a new printer to the device's memory, go to **Main Menu / Printers / Add printer**, then enter the printer code by selecting the characters using the arrows and confirming with the OK button (to delete a character, select the „<" symbol and confirm with the OK button). When the name is entered, press the ESC button and when the message „Confirm code?" appears, confirm with the OK button or cancel with the ESC button, e.g.



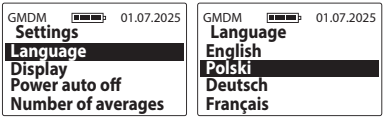
c) **Delete printer** – to delete a given printer from the device memory, go to **Main Menu / Printers / Delete printer**, then select the appropriate printer from the list and confirm with the OK key or cancel with the ESC key, e.g.



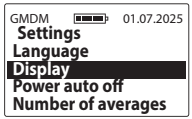
7. **Settings**

7.1 **Language**

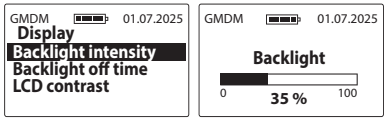
To change the device's language version, go to **Main Menu / Settings / Language**, then select the language version using the ⌄ or ⌃ keys and confirm with the OK key, e.g.



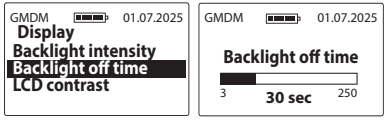
7.2 **Display**



7.2 a) **Backlight intensity** – we have used energy-saving LED backlighting, however, please note that a stronger backlight increases power consumption, which leads to faster battery discharge. To change the backlight intensity, go to **Main Menu / Settings / Display / Backlight Intensity**, then select the appropriate value using the ⌄ or ⌃ keys and confirm with the OK key, e.g.p.



7.2 b) **Backlight Time** – adjusts the time after which the display backlight turns off and the device goes into idle mode, waiting for the keyboard to be used again (the time is counted from the last click/use of a key on the device's keyboard). To change the backlight time, go to **Main Menu / Settings / Display / Backlight Time**, then select the appropriate value using the ⌄ or ⌃ keys and confirm with the OK key, e.g.



7.2 c) **Contrast** – to change the display contrast, go to **Main Menu / Settings / Display / Contrast**, then select the appropriate value using the ⌄ or ⌃ keys and confirm with the OK key, e.g.

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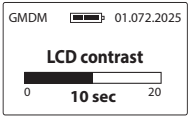
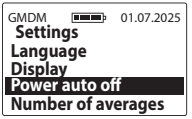
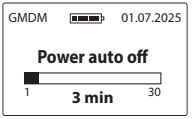


7.3 **Auto-off Time**

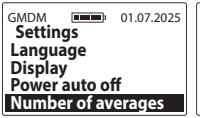
Adjusts the time after which the device automatically turns off, counting from the last click/keyboard activity. To change the auto-off time, go to **Main Menu / Settings / Auto-off Time**, then select the appropriate value using the ⌄ or ⌃ keys and confirm with the OK key, e.g.

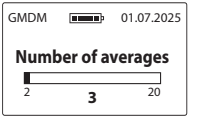




7.4 **Number of Averages**

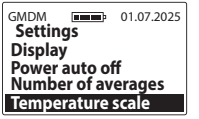
The device automatically calculates the average from the last measurements. To set the number of measurements to be averaged, go to **Main Menu / Settings / Number of Averages**, then use the ⌄ or ⌃ key to select the appropriate number and confirm with the OK key, e.g.

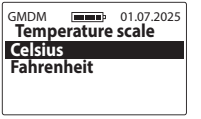




7.5 **Temperature Scale**

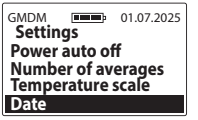
To change the temperature scale from Celsius to Fahrenheit or vice versa, go to **Main Menu / Settings / Temperature Scale**, then select the appropriate scale using the ⌄ or ⌃ keys and confirm with the OK key, e.g.:



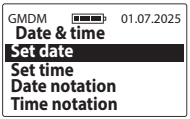


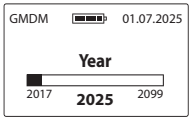
7.6 **Date and time**

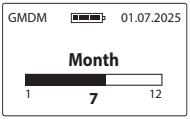
GMDMv2 has a **real-time clock**, so measurement results are saved in memory along with the current date and time of measurement.

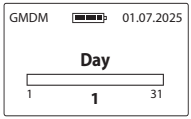


7.6 a) **Set date** – to set the current date, go to **Main Menu / Settings / Date and time / Set date**, then use the ⌄ or ⌃ keys to select the appropriate value and confirm with the OK key year/month/day, e.g.

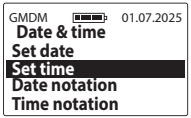


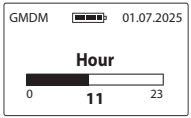


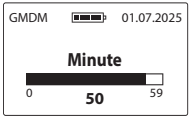




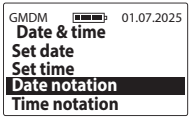
77.6 b) **Set time** – to set the current time, go to **Main Menu / Settings / Date and time / Set time**, then use the ⌄ or ⌃ keys to select the appropriate value and confirm with the OK key in the hour / minutes sequence, e.g.

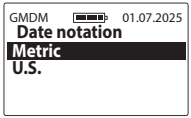






7.6 c) **Date saving** – to change the date display format, go to **Main Menu / Settings / Date and time / Date saving**, then use the ⌄ or ⌃ keys to select the appropriate option and confirm with the OK key, e.g.

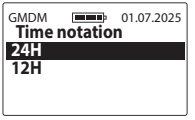




7.6 d) **Time recording** – to change the time display format, go to **Main Menu / Settings / Date and time / Time**

EN

recording, then use the ⌄ or ⌃ keys to select the appropriate option and confirm with the OK key, e.g.



8. **Information**

To check device information and the manufacturer's contact details, enter the **Main Menu** using the ESC key, then use the ⌄ or ⌃ keys to select the **Information** option and confirm with the OK key.

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

CHARGING THE BATTERY

CHAPTER 9

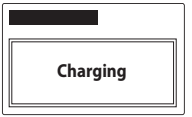
EN

The device automatically signals when the power source is low. In this case, it displays the message **„Charge battery."**

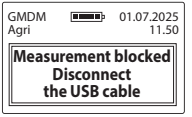
It uses one 3.6V, 3200mAh Li-ion battery cell, charged via the USB-C port, and is electronically protected against overcharging and overheating.

To charge the battery, proceed as follows:
1. Remove the USB-C port cap,
2. Connect the power cable to a standard phone charger,
3. The charging process will begin and take up to 4 hours.

When the device is turned off, the charging screen will be displayed.



Note: During charging, the measurement is blocked and the device displays a message.



TECHNICAL DATA

CHAPTER 10

EN

Device weight	1530 g
Dimensions	25.0 x 16.0 x 12.0 cm
Chamber filling	Semi-automatic, from a special dispenser
Sample volume	210 ml
Moisture measurement method	Capacitive-gravimetric
Sample structure	Whole grains
Intended use	Cereals, oilseeds, legumes, legumes, industrial grains, coffee
Periodic device calibration required	–
Display	LCD with LED backlight, 2.4" diagonal
Operation	Membrane keyboard (durability 5 million clicks)
Power supply	Li-ion battery, 3400 mAh, 3.7 V
Battery low indicator	Automatically signaled
Current consumption	20 to 60 mA depending on the backlight intensity setting
Operating time at 0% backlight	approximately 150 hours of continuous operation
Operating time at 30% backlight	approximately 100 hours hours of continuous operation
Charging current	1 A
Full charge time	4 h
Measurement control	single-chip microcomputer
Measured parameters	humidity / temperature / bulk density

Temperature measurement accuracy	±1°C
Humidity measurement accuracy	±0.8% in the range up to 10.0% moisture Above 10.0% ±0.04 of the measured value +0.4% For corn ±0.9% in the range up to 10.0% moisture Above 10.0% ±0.05 of the measured value +0.4%
Resolution of readings	humidity – 0.1%, temperature – 0.1°C, density – 0.1 kg/hl
Temperature compensation	automatically taken into account
Communication	USB-C, BT (Bluetooth)
Possibility of independent software and data updates	+
Printing option	+ (on a dedicated printer)
Built-in weighing system	+
Tilt control	+
Calibration capability	+ (in an accredited laboratory)
Available density units	kg/hl, kg/m3, kg/l, g/cm3, kg/bu (US), oz/bu (US), oz/US gal, lb/US gal
Device settings menu	+
Results can be saved to the device's memory	+
Data management software	+
Additional product features	tilt control system, Bluetooth LE module, real-time clock, result saving, customer list creation, wireless printer, data editing for printouts, bulk density measurement, result averaging, battery status indicator, multilingual menu
Additional accessories	dedicated wireless printer

Recommended operating temperature	10°C to 35°C
Recommended storage temperature	5°C to 45°C
Warranty	3-year
Place of production	Poland
Manufacturer	Dramiński S.A.
EAN Code	

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TECHNOLOGY

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