GrainSense LAB

User Manual – Draft

GrainSense

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Manufacturer:

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Contact details can be found on the back page of this manual.

Information

The information included in this manual corresponds to our current state of knowledge and is no claim for completeness.

This manual is only intended for the **GrainSense Lab analyzer 1.4**. Before using the GrainSense analyzer, the operator must carefully read the detailed instructions for the safe and correct usage of the GrainSense analyzer.

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1. Package contents

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2	Sensor
3	Legs
4	Screws, washers and wingnuts
5	Grain containers
6	Funnels
7	Power supply, cable and adapters
8	USB cable
9	Cleaning brush
10	The document

1. Shipping / Carry case

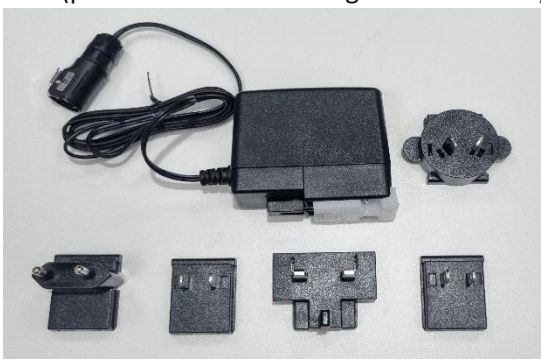
2. Sensor

3. Legs and 4. Screws, washers and wingnuts

5. Grain containers

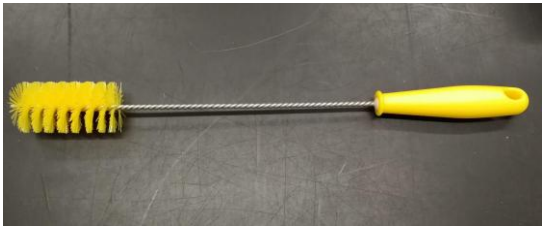
6. Funnels
   (yellow for rapeseed/canola and black for others)

7. Power supply, cable and adapters
   (packed into one of the grain containers)



8. USB cable (packed into the grain container)

9. Cleaning brush



10. Package list document

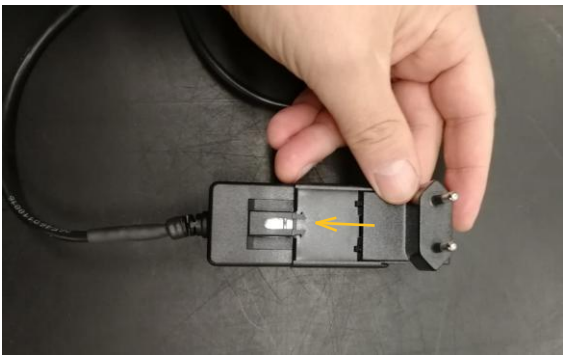
2. Hardware installation steps

1. GS Lab analyzer is packed in a protective carry case

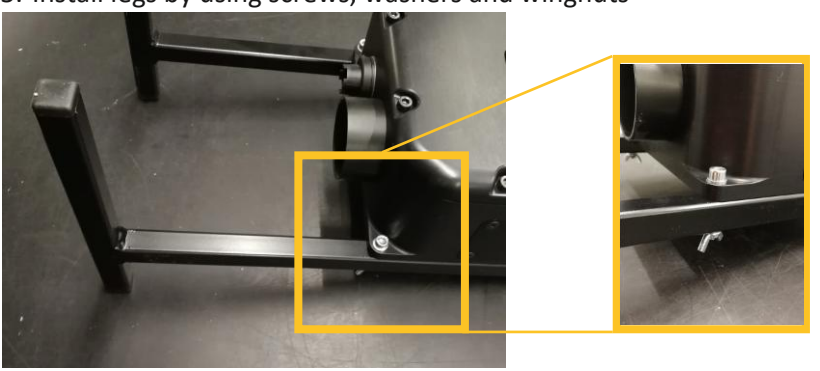
2. Open the case

3. Check that package contains all necessary items (see package contents)

4. Plug correct power supply adapter (EU adapter in picture)



5. Install legs by using screws, washers and wingnuts



6. Connect USB cable to the sensor.

7. Connect power connector

Ensure that you connect the power cable to the upper connector (in the picture the bottom left), which is designated for the power supply. The connector will make a clicking sound when it is properly attached.

8. Ready installation (**PC not included**)

3. Account registration

a) **Register an account on GrainSense website:**
(https://grainsense.com/pages/account-registration)
Make sure that you choose the right product
"**GRAINSENSE LAB USER ACCOUNT LICENSE**"

Unless you have a VAT -number within EU, you may skip said input on the registration form

Finish account registration by checking your chosen email address for a verification email, then click the verification link. If you get an error during registration or did not receive a verification email, please first check your junk or spam folder(s). If you can't find the verification email, or need help with anything – please contact GrainSense Support at: support@grainsense.com

b) **The welcome email contains a software installer link. Latest version is also available in https://grainsense.com/pages/applications**

c) **Please follow Software installation instructions (included to the package).**

4. Measurements, settings and cloud data

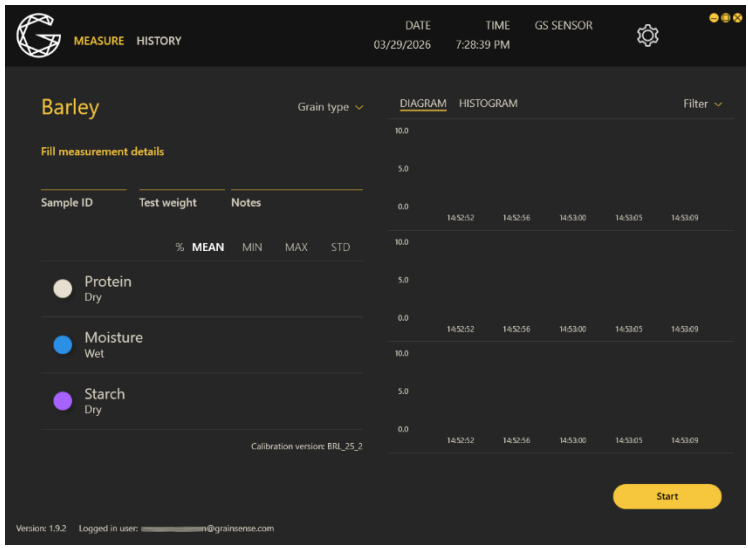
Start the Lab application on your PC and log in using your credentials.

Ensure that the sensor unit is powered on: the power switch on the cord should be in the "on" position, and the sensor cable must be properly connected.

When the sensor is powered and in standby mode, the LED light at the bottom of the sensor will glow yellow.

The LED turns green when the sensor is active—such as during measurements or when interacting with the Lab application.

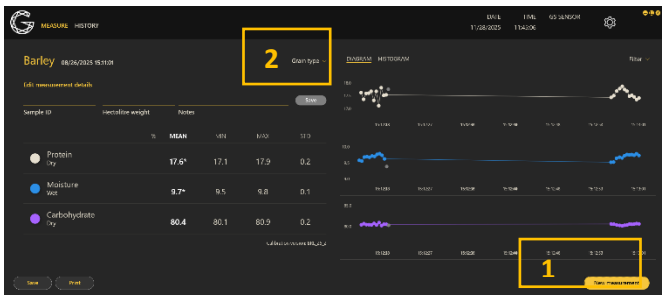
Application start screen is Measurement -view. On the bottom of the Measurement -view Application version number and login information can be found.



1) Once you have signed in on the application you can begin your measurements by clicking “**New measurement**” and choosing the species that you will be measuring this time (If you get an error stating “No sensor cable” or similar, check that the sensor cable is properly attached and then power sensor off and on, by removing it from the power outlet and putting it back in again)

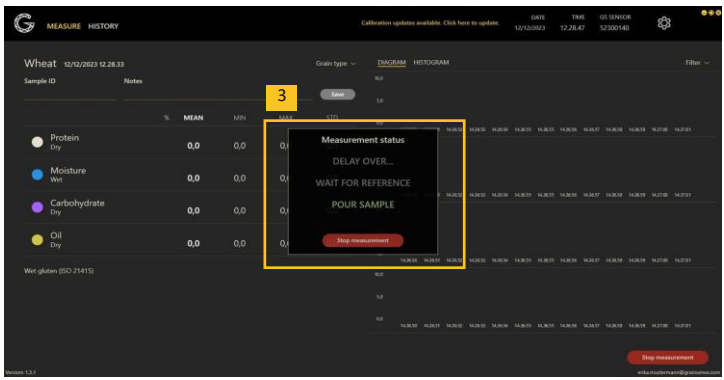
2) Select the species that you wish to measure from either of two places. Near the top left corner you can select “**Grain type**” for a dropdown menu to fast select a species, if you wish a selection to stay for when you restart the application, change the species via Settings (the cogwheel onto the right upper corner)

Make sure that you have two 1 litre vessels and a funnel, put an empty vessel below the output pipe of the sensor unit and then connect the correct funnel onto the intake slot on top of the sensor unit.



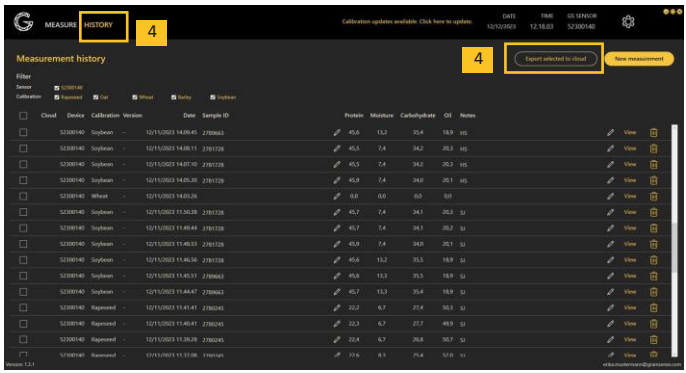
3) After you have started a measurement, a small **pop-up screen appears telling you that a reference measurement is being taken** and shortly after that the device is ready for a measurement and you can pour in the sample vessel (extra delay period can be adjusted, or nullified in the settings). Do not pour grain samples before Application advises **POUR SAMPLE**.

Note: To get a good flow and more reliable results, be sure to pour in the entire sample in at once, the funnel is able to take the entire content of the white jar in one session.



Note: Depending on your settings the measurement session will either automatically stop after the grain flow ends or you will manually have to stop the measurement, after which you can find the completed measurement in the history tab, to view or edit its note
(you may choose to use the auto-stop -feature from Settings by checking the tooltip box accordingly)

4) To export any measurement data to the cloud, simply select the "**History**" -tab and from there select all the measurements that you wish to export, then click "**Export selected to cloud**", you can select multiple measurements or just a single one. A symbol will be created for any measurements exported to cloud, and any cloud measurements will also be visible on the **user dashboard** (log in from GrainSense website)

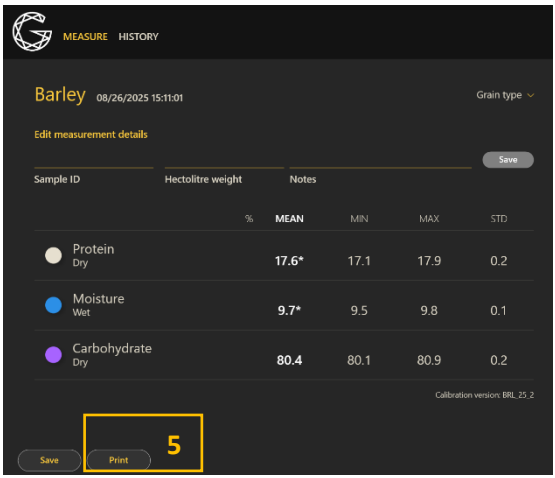


From the **user dashboard** you can export any measurement data into excel -format, by selecting the measurement that you wish to export from the left side – and then selecting "**Action**" near the top to either "**Delete**", "**Export**" or "**Join**" a measurement. When you choose to export a measurement, you can choose to deliver it via email by inputting a valid email address or just a direct download.

5) **Direct Print**

In the Measurement View by clicking **Print** button, user can print the displayed measurement result directly.

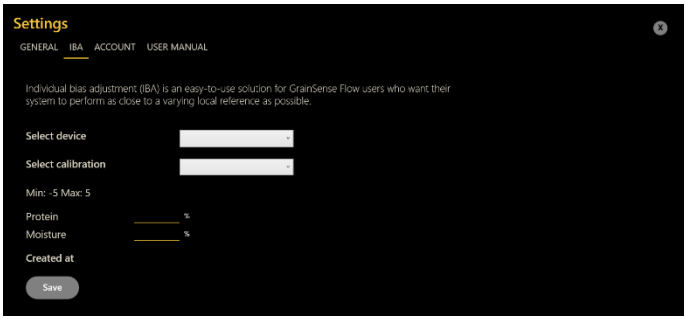
Important: Printing is sent to the default printer configured in the Windows operating system. Make sure the correct printer is set as the default in your Windows settings.



6) Individual Bias Adjustment (IBA)

If you need to align the measurement results with another master reference instrument, it is possible to apply Individual Bias Adjustment (IBA) corrections.

Go to **Settings** and select **IBA** sheet.



Your connected GrainSense LAB sensor serial number should appear to **Select device** -field.

Select species for which you want to make Individual Bias Adjustment on the to **Select calibration** -field and add wanted value or values of correction to Protein and/or Moisture fields.

More detailed information for setting IBA values is available from GrainSense Support support@grainsense.com, or visit the GrainSense website for detailed guidance. https://grainsense.com/pages/materials

7) Individual Slope Adjustment (ISA)

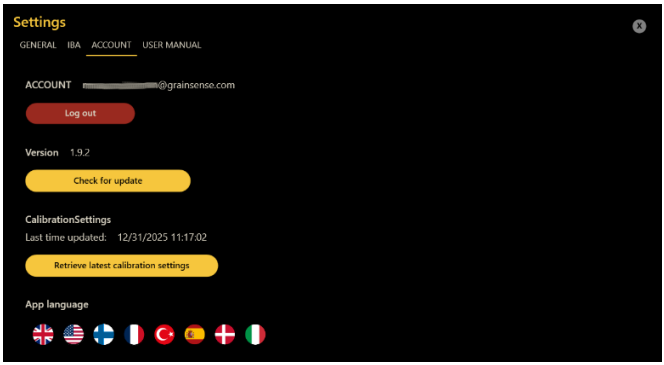
In normal use, the device does not require slope adjustments. However, if you need to align the measurement results with another master reference instrument, it is possible to apply Individual Slope Adjustment (ISA) corrections.

If you plan to use ISA, please request the relevant calibration instructions and reference material from GrainSense Support

support@grainsense.com, or visit the GrainSense website for detailed guidance.
https://grainsense.com/pages/materials

5. Application and Calibration versions and updates

Application version and Calibration version can be found by going to **Settings** and selecting **Account** sheet. Available update for Application can be checked and downloaded by clicking **Check for update**. Latest Calibration updates can be downloaded by clicking **Retrieve latest calibration settings**.



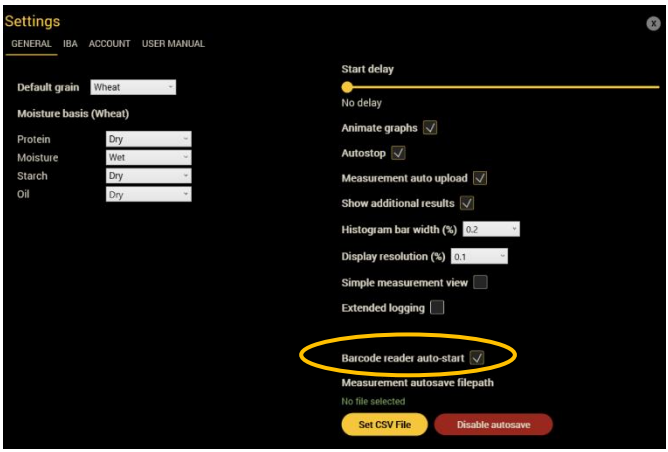
6. Barcode reader usage

The GrainSense LAB application supports most standard barcode readers. You can use a barcode reader to quickly input the **Sample ID**.

Tip: You can enable **Automatic Measurement Start** in **Settings** (accessible via the cogwheel icon in the upper-right corner).

When this option is enabled, scanning a barcode will automatically start the measurement process. This feature is especially useful when measuring multiple samples, as it speeds up the workflow.

Settings screen example:



7. Electrical Specification

Power Supply Unit (PSU) Electrical Specification

Input Voltage Range:	100–240V AC, 50/60Hz
Voltage Fluctuation Tolerance:	±10%
Output Voltage:	12V DC
Output Power:	24W
Output Current:	2A
Overvoltage Category:	II

8. Environmental requirements

Storage temperature:	-20 to +85 °C [~-4 to +185 °F]
Operation temp.:	+5 to +45 °C [~+41 to +113 °F]
Operating humidity:	5% to 95% RH, non-condensing
Operating altitude:	up to 2000 meters above sea level
Usage Environment:	Indoor Use Only
Pollution Degree:	2

9. Maintenance and Service

Basic Maintenance

To ensure continued performance and safety of the device:

- Keep the device clean and free from dust.
- Use a dry or slightly damp lint-free cloth for cleaning.
- Do not use solvents, sprays, or abrasive materials.
- For glass tube cleaning, use the provided brush included with the product.

Power Cord

The device includes a certified AC/DC power supply. Do not replace the mains supply cord with any other AC/DC power supply.

User-Replaceable Parts

The only user-replaceable component is the light bulb. Refer to the separate instructions provided for safe replacement.

Manufacturer-Specific Parts

All other components are manufacturer-specific and must be serviced or replaced only by GrainSense Oy or an authorized agent.

Fuses

This device does not contain user-replaceable fuses.

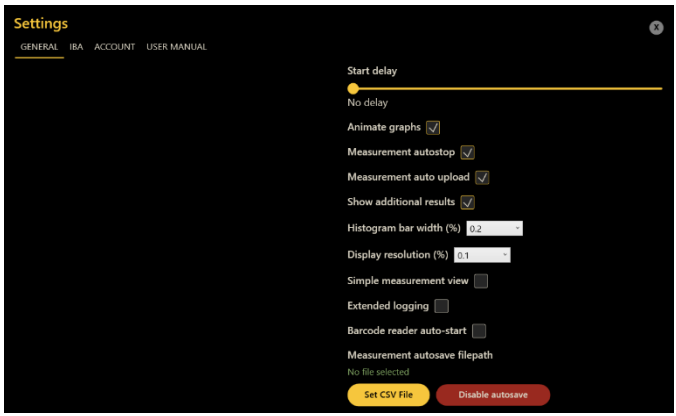
10. Service Personnel Instructions

Product-specific risks: No high-voltage areas are present.

Protective measures: Use ESD protection when opening the device. The enclosure is sealed with tamper-evident stickers; opening voids warranty.

Post-repair verification: Perform a functional test and visual inspection to ensure safe operation.

11. Application Settings



Start delay

Adjustable delay for the measurement start

Animate graphs

Setting to enables or disables measurement result animated graphs

Measurement autostop

Setting to enable automatic stop of the measurement when grain flow has ended.

Measurement auto upload

Setting to upload measurement results automatically to Cloud

Show additional results

Setting to show possible additional results like wet gluten calculation for wheat

Histogram bar width (%) [default 0.2]

Setting to control graphics for measurement histogram

Display resolution (%) [default 0.1]

Setting to control graphics for measurement results

Simple measurement view

Setting to show only the compound mean values for the measurement result

Extended logging

Setting to enable extended logging for troubleshooting purposes by GrainSense support personnel

Barcode reader auto-start

Setting to enable or disable measurement start automatically from barcode reading

Measurement autosave filepath

Setting to enable measurements autosave to .csv file

12. Faults codes, explanations and corrective actions

10110: Internal temperature low

Device is being used at too low temperature. Increase ambient temperature.

10120: Internal temperature high

Device is being used at too high temperature. Decrease ambient temperature.

10210: Internal temperature low

Device is being used at too low temperature. Increase ambient temperature.

10220: Internal temperature high

Device is being used at too high temperature. Decrease ambient temperature.

10310: Detector temperature low

Device is being used at too low temperature. Increase ambient temperature.

10320: Detector temperature high

Device is being used at too high temperature. Decrease ambient temperature.

10410: Lamp voltage low

Restart device and if the problem persists contact support.

10420: Lamp voltage high

Restart device and if the problem persists contact support.

10510: Internal temperature unstable

Device internal temperature has varied considerably during measurement. If the measured results are stable, the error can be safely ignored.

10610: Internal temperature unstable

Device internal temperature has varied considerably during measurement. If the measured results are stable, the error can be safely ignored.

10710: Detector temperature unstable

Detector temperature has varied considerably during measurement. If the measured results are stable, the error can be safely ignored.

10810: Lamp voltage unstable

NIR lamp may need to be replaced. If the error persists, contact support.

20110: Dark reference spectrum level low

Detector malfunction. Restart device and if the error persists contact support.

20120: Dark reference spectrum level high

Light baseline is too high. Make sure that the device is not used under an incandescent bulb or in direct sunlight. In case the error persists contact support.

20310: Reference spectrum level low

NIR lamp needs to be replaced. Contact support.

20320: Reference spectrum level high

NIR lamp needs to be replaced. Contact support.

30100: Reference spectrum unstable

Detector malfunction. Restart device and if the error persists contact support.

30200: Sample spectrum unstable

Detector malfunction. Restart device and if the error persists contact support.

30300: Outlier scans only

All measured spectra marked as outliers. This may come from several different reasons. The most common reasons are too high or too low grain flow, blockage, incorrectly selected calibration, too high foreign matter content in the sample or unusual cultivar. Check other errors for further information.

30310: Too many outlier scans

Unusually high percentage of outlier spectra. This may come from several different reasons. The most common reasons are too high or too low grain flow, blockage, incorrectly selected calibration, too high foreign matter content in the sample or unusual cultivar. Check other errors for further information.

40110: Spectrum level low

Grain flow through the sensor is too low, increase flow.

40120: Spectrum level high

Grain flow through the sensor is too high, decrease flow.

50100: Spectrum unstable

Most likely grain flow through the sensor is too low, increase flow. If the error persists contact GrainSense support.

60110: Total milligrams below calibration limit

Grain flow through the sensor is too low, increase flow. Check also selected calibration.

60120: Total milligrams above calibration limit

Grain flow through the sensor is too high, decrease flow. Check also that the calibration is selected correctly.

70110: Compound percentage below calibration limit

Predicted percentages are below the calibration limit. Check also that the calibration is selected correctly.

70120: Compound percentage above calibration limit

Predicted percentages are above the calibration limit. Check selected calibration.

90001: Temperature sensor value missing

Sensor communication error. In case of isolated measurements the error can be safely ignored. If the error persists contact GrainSense support.

90002: Temperature sensor value missing

Sensor communication error. In case of isolated measurements the error can be safely ignored. If the error persists contact GrainSense support.

90003: Temperature sensor value missing

Sensor communication error. In case of isolated measurements the error can be safely ignored. If the error persists contact GrainSense support.

90004: Voltage sensor value missing

Sensor communication error. In case of isolated measurements the error can be safely ignored. If the error persists contact GrainSense support.

Customer Return Instruction Sheet

Dear Customer,

Thank you for using GrainSense LAB. When your device reaches end-of-life, please follow these steps:

1. **Do not dispose of the device in household waste.**
   This product is subject to WEEE regulations.
2. **Return the device to GrainSense Oy for recycling at no cost to you.**
   Pack the device securely.
   Include any accessories originally supplied.
3. **Ship to:**

   Grainsense Oy
   Tutkijantie 9
   FIN-90590 Oulu
   FINLAND

4. **Shipping Costs:**
   We cover all shipping costs.
   Please contact us at **sales@grainsense.com** / **+358 44 970 6079** for a prepaid shipping label.
5. **Why return?**
   Recycling helps recover valuable materials and prevents environmental harm.

Thank you for supporting sustainable practices.

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For technical support, please contact: support@grainsense.com

www.grainsense.com