

User Manual

GrainSense®

COMBINE v1.4 Analyzer



GrainSense



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This manual is only intended for the GrainSense Flow Combine Analyzer v1.4.

Before using the GrainSense Flow Combine Analyzer, the operator must read carefully the detailed instructions for safe and correct use of the GrainSense Flow Combine Analyzer.



Table of Contents

1.	Introduction.....	5
2.	Safety and correct usage instructions	5
2.1	Safety	5
2.2	Correct use	6
2.3	Exclusion of warranty	6
3.	GrainSense Combine analyzer	7
3.1	Product description	7
3.2	GrainSense Flow Combine V1.4 Delivery Content.....	8
3.3	Sensor connectors	9
3.4	Gateway connectors and fuses	10
4.	GrainSense Combine Dashboard	12
5.	GrainSense Data collection	12
5.1	GDPR guidance	12
5.2	Data infrastructure and protection	12
5.3	Data handling	12
5.4	User data control	13
6.	Technical specifications	14
7.	Installation.....	15
7.1	Installation instructions	15
7.2	Package Contents (see 3.2).....	15
8.	Installation in Combine Harvester.....	16
8.1	Installing the sensor unit and dosing auger	16
8.2	Installation of Sensor Unit, Dosing Auger, and Input Components	17
8.3	Installation of the Input Collector, Bypass, and Hose Connections	18
8.4	Installing the gateway.....	19
9.	Operation Instructions.....	20
9.1.	How does it work?.....	20
9.2.	Powering up the GrainSense Combine Analyzer	20



9.3.	Network settings	22
9.4.	Login	23
9.5.	Check for updates.....	24
9.6.	Language selection	25
9.7.	Measurement settings	26
9.7.1.	Calibration selection	27
9.7.2.	Setting alarms/relays	28
9.8.	Starting measurement session.....	29
9.9.	Stopping measurement session	31
9.10.	Viewing results	31
10.	Registering to GrainSense cloud	32
11.	Maintenance and servicing.....	35
11.1.	Preventive maintenance	35
11.2.	Cleaning the glass tube.....	35
11.3.	Updating the calibrations on the GrainSense Combine analyzer	35



1. Introduction

Thank you for choosing GrainSense.

With GrainSense Combine analyzer, you analyse your grain. You can track your grain quality real-time from flowing grain. You receive reliable data, and you can store results in the cloud – so you can make the right decisions to control your outputs.

The GrainSense Combine analyzer is a revolutionary grain analyzer with advanced NIR (Near Infrared) technology. You get reliable protein, moisture, oil and carbohydrate contents instantly from flowing grain.

2. Safety and correct usage instructions

2.1 Safety

GS Combine analyzer is designed and manufactured in compliance with the latest applicable EU regulations, directives, and standards to ensure safety. It is essential to familiarize yourself with the information regarding product compliance and markings. GS Combine analyzer complies with all relevant EU regulations, directives, and standards applicable to its intended use. It has been designed and manufactured to meet the given requirements, ensuring its safe operation when used as directed.

Type Label: Please refer to the type label attached to the product for specific markings indicating compliance with relevant regulations, directives, and standards. The type label provides important information such as the CE marking and other possible and relevant certifications.

CE Marking: The CE marking on GS Combine analyzer indicates its compliance with the essential requirements of applicable EU directives and regulations. It demonstrates that the product has undergone assessment and meets the necessary safety, health, and environmental protection standards. Declaration of Conformity is available from request.

User Responsibilities: As a user of GS Combine analyzer, it is important to read and understand the user manual in its entirety. Follow all instructions, warnings, and precautions provided to ensure safe operation, prevent hazards, and maintain the product's performance.

If you have any questions regarding the safety, compliance, or operation of GS Combine analyzer, please contact our **customer support**: support@grainsense.com. Our team is available to provide guidance and address any concerns you may have.

Remember, it is crucial to adhere to safety guidelines, use the product as instructed, and exercise caution while operating GS Combine analyzer. Failure to follow these instructions may result in personal injury, property damage, or compromised product performance. By using GS Combine analyzer, you acknowledge that you have read and understood this safety chapter, and you agree to assume responsibility for using the product in a safe and responsible manner.



2.2 Correct use

The following points must be observed in order to use the GrainSense Combine analyzer in a correct manner:

Set up and operation

Adherence to the maintenance and servicing instructions

2.3 Exclusion of warranty

GrainSense is not liable for the following damages of the GrainSense Combine analyzer:

- All damage to the GS Combine analyzer misuse.
- Damage to the display resulting from applied pressure and scratches.
- Incorrect storage.
- Usage beyond the range of operational temperatures.

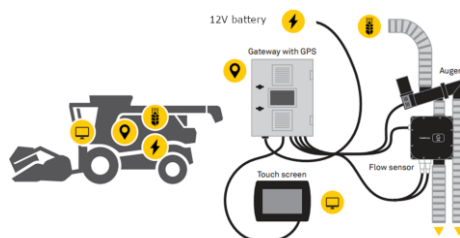
3. GrainSense Combine analyzer

3.1 Product description

The GrainSense Combine analyzer has been developed for analyzing real-time grain quality in environments where grains are flowing. The GrainSense Combine analyzer measures protein, moisture, oil and carbohydrates online during processing or storing.

From a grain entry and exit system, the GrainSense Combine analyzer will continuously extract a sample of the grain from the connected system and perform a real-time quality analysis. The key values can be seen on the display of the device and the measurement data is sent to GrainSense Cloud, enabling the user to monitor the results in real time and to make quality-based decisions.

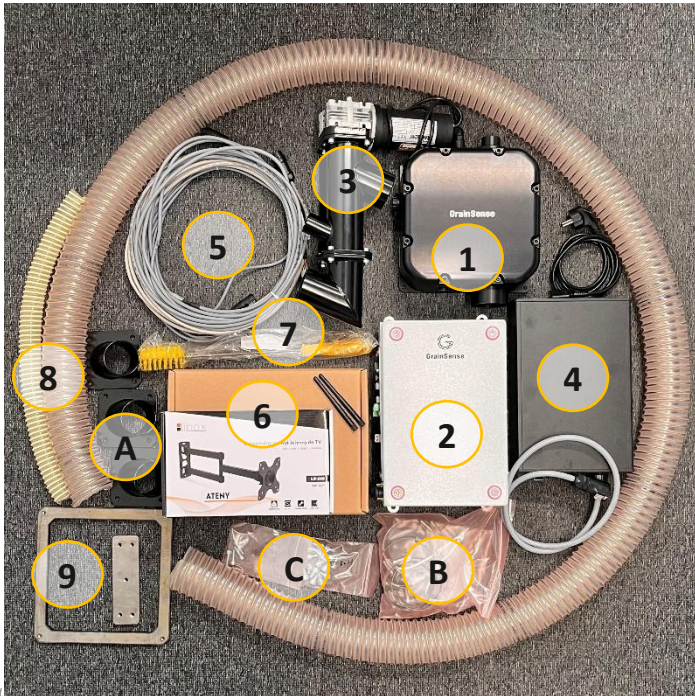
GS FLOW ON COMBINE HARVESTERS



Schematic view of operation principle



3.2 GrainSense Flow Combine V1.4 Delivery Content



(Note, Power L

1. GrainSense Combine analyzer Sensor unit
2. GrainSense Combine analyzer Gateway unit
3. GrainSense Combine analyzer Dosing Auger
- 4.
5. Cables (Auger Control, Sensor Power, Sensor Communication)
6. Touchscreen Display, cables and mounting kit, and Wi-Fi antennas for Gateway
7. Brush for cleaning the glass tube
8. Hoses (auger to sensor 32mm Ø, material for input/output and bypass 63mm Ø)
9. Mounting plates for Dosing Auger [and GrainSense Combine analyzer, not commonly used]
- A. Grain Inlet/Outlet adapters 3 pcs
- B. Hose clamps 8 pcs
- C. Bolts



Grain Inlet for elevator

3.2.1 Additional installation equipment and connectivity requirements

During installation and operation Wi-Fi connection is needed.

Needed installation equipment for installation:

- A drill and a screwdriver
- Welding machine (if applicable)
- Alloy wrenches
- Drill bit hole saw 60 mm

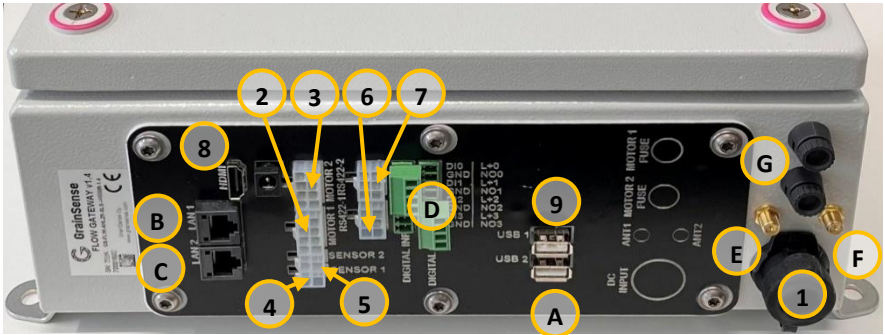
3.3 Sensor connectors



*Sensor power connector (2pin) on the bottom left
and communication connector (multi-pin) bottom right*



3.4 Gateway connectors and fuses



1. **DC Input**, Power Inlet (4-pin)
2. **Motor 1** / Dosing Auger 1 Outlet (8-pin connector)
3. **Motor 2** / Dosing Auger 2 Outlet (8-pin connector),
for Dual-Sensor and Dual-Auger product version
4. **Sensor 1**, Sensor Power 1 Outlet (2-pin connector)
5. **Sensor 2**, Sensor Power 2 Outlet (2-pin connector),
for Dual-Sensor and Dual-Auger product version
6. **RS422-1**, Sensor 1 Communication Connector (6-pin connector)
7. **RS422-2**, Sensor 2 Communication Connector (6-pin connector),
for Dual-Sensor and Dual-Auger product version
8. **HDMI**, Touchscreen display
9. **USB 1**, Touchscreen display
- A. **USB 2**, Reserved
for GPS in GS Flow Combine product version
- B. **LAN1**, Ethernet port (RJ45) for industrial protocol support;
WebSocket, Modbus TCP/IP or OPC UA
- C. **LAN2**, Ethernet port (RJ45) Reserved
- D. **Digital Inputs / Outputs**, Trigger I/O's, for usage contact GrainSense support

**Cable Connectors Attachment to 1-7:**

Check that the orientation of the connector is correct.

Apply firm pressure while pushing the connector into place. One should feel or hear a distinct snap as the locking mechanism engages. This ensures a secure connection.

Cables Detachment:

Depress the connector's release button.

- E. **ANT1**, Wi-Fi 1 antenna connector (rp-sma)
- F. **ANT2**, Wi-Fi 2 antenna connector (rp-sma)

Optimal Wi-Fi Antenna Positioning:

Aim for a 90-degree angle between antennas, if feasible.

- G. User-accessible fuse holders (screw caps), glass cartridge fuses for auger motors



4. GrainSense Combine Dashboard

The GrainSense Dashboard is a great web tool to analyze and manage the measurements on computer or tablet. Visit it at <https://flowdashboard.grainsense.com/>. The GrainSense Flow Dashboard also allows the user to export the data via an .xls or .csv file.

5. GrainSense Data collection

5.1 GDPR guidance

GrainSense is fully compliant with the General Data Protection Regulation (GDPR)

The GDPR has been in place since 25.5.2018. and involves all companies handling data from EU citizens. Data controllers (i.e. company) and data processors (company or subcontractor) are required to comply and give more power to a person regarding his data, that includes to:

Ask explicit consent for all different data types (GPS, email marketing, etc), describe how to data is used and for what purpose

Allow users to control the data (delete and export)

Companies must also have an internal guidance (this chapter of the User Manual) on GDPR.

5.2 Data infrastructure and protection

GrainSense acts as a data controller and processor, but for processing, it uses an outsourced infrastructure (Amazon AWS). GrainSense has taken measures to protect user data by:

- Applying standard encrypted HTTPS (TLS) communication
- Using proper authorization and authentication methods
- Using enterprise level framework (Java Spring)
- Taking nightly backups of the data (last 30 days)
- Limiting admin rights to the databases (two key persons have access to user's personal data)

5.3 Data handling

GrainSense gathers data of all registered users to:

- Provide calibrations and other data to users and to their GrainSense Combine analyzers
- Provide statistical analyses of the user-specific data, and to showing it only to the user itself
- Verify account status and level
- Store all measured data to provide an access anytime anywhere to the user
- Provide high level customer support and guidance
- Provide higher level statistical data of a specific reason (anonymized) and providing it to all users



5.4 User data control

The user can stop their subscription at any time and ask for their data to be deleted by sending a request to support@grainsense.com from the account email address. Deletion is made completely anonymizing the user data: User details (email, address, etc) are anonymized and GPS locations changed. However, measured data itself is not deleted and will be used for statistical purposes.



6. Technical specifications

Sensor Size	225x225x110 mm
Gateway Size	300x200x120 mm
Weight of the sensor	5 kg
Weight of the Gateway	4 kg
Power supply:	12 VDC $\pm$ 10 %, max. 15 A
IP Class for sensor	IP69K
IP Class for gateway unit	IP54
Measurement principle	Near infrared transmittance spectroscopy
Sample size	100 grams per second flows through the sensor when measurement is ongoing
Species	Wheat, Durum wheat, Barley, Oats, Rye, Maize (Corn), Rapeseed (Canola), Soybean
Storage temperature	-20 to +85 °C (-4 F to 185 F)
Operation temperature	+5 to +45 °C (32 F to 113 F)



7. Installation

Continuous grain flow is extracted from e.g., combine harvester's elevator to dosing auger of the GrainSense Combine Analyzer. Dosing Auger feeds a steady grain flow through the GrainSense Combine Analyzer sensor unit.

7.1 Installation instructions

This document describes the installation procedure of the GrainSense Combine Analyzer. The Combine Analyzer can be installed in a combine harvester or in a grain handling facility.

Every location is somewhat unique and planning before starting the installation is recommended.

7.2 Package Contents (see 3.2)

Before starting the installation, check the installation location and carefully plan the exact place for the Sensor unit and the dosing auger. Included mounting plates can be used in combine harvester installation.

8. Installation in Combine Harvester

8.1 Installing the sensor unit and dosing auger

GrainSense Combine Analyzer is typically installed in the combine harvester's clean grain elevator. The dosing auger and the input hose are installed above the sensor unit. Before starting the installation, make sure there is enough space for the dosing auger and for the input hose above the planned location of the sensor unit. Also, the input hose acts as a grain buffer for the Combine Analyzer, so the longer the input hose is, the bigger the grain buffer is.



Examples of Dosing Auger and Sensor installation

Once the installation location has been determined, mark the exact position for the sensor unit's mounting plate. The plate will be welded (if applicable) to the elevator structure. It is essential to ensure the location is suitable for installation and perfectly horizontal. After marking the position, proceed to weld the mounting plate in place.

NOTE! The installation is performed in a dusty environment. Make sure that all local regulations for welding are followed and take needed precautions to minimize the possibility of catching fire while welding.

8.2 Installation of Sensor Unit, Dosing Auger, and Input Components

Install the Sensor Unit

- Once the sensor unit's mounting plate has been welded in place, install the sensor unit securely.

Determine the installation for the Dosing Auger and Install it

- With the sensor unit installed, identify the correct position for the dosing auger. It must be mounted directly above the sensor unit, ensuring that the auger's output aligns precisely with the sensor unit's input.
- Mark the correct location for the dosing auger's mounting plate.
- Weld the mounting plate using the same procedure as for the sensor unit.
- After welding, install the mounting bracket and attach the dosing auger.

Install Input Collector Box and Related Components

- Next, install the input collector box, the mounting plate for the dosing auger's bypass hose, and the output hose for the sensor unit.
- The input collector box, which connects to the dosing auger's input hose, should be installed above the dosing auger and aligned with its input.
- For optimal grain flow, it is recommended to install the lower parts of the system in a clean section of the elevator.
- A greater vertical distance between the mounting plate and the dosing auger increases the buffer capacity, allowing more grain to flow into the sensor.
- Once the location is finalized, mark the position.
- Then, mark and cut the opening for the collector box and drill the necessary holes for the installation bolts.



Another example of installation

8.3 Installation of the Input Collector, Bypass, and Hose Connections

Install the Input Collector Box

- Apply adhesive mass when installing the input collector box to the elevator. This helps prevent dust leakage from the collector.
- Ensure the collector is properly aligned with the dosing auger's input.
- Install the Bypass Hose Mounting Plate



The mounting plate for the dosing auger's bypass hose should be installed directly below the bypass and aligned with it.

- Weld the mounting plate in place using the same method as for the previous mounting plates.
- Once welded, install the bypass hose.

Install the Sensor Unit Output Mounting Plate

- Position the mounting plate directly below the sensor unit, ensuring alignment with the sensor unit's output.



- Weld the plate in place following the same procedure as above.

Connect the Hosing System

- After all mounting plates have been welded and the input collector box is installed, proceed with connecting the hoses:
 - Input hose
 - Output hose
 - Bypass hose
 - Connecting hose between the dosing auger and the sensor unit
 - Use the hose clamps provided to securely fasten all hose connections.
 - Avoid bending hoses to under 100mm radius



8.4 Installing the gateway

The gateway unit is installed in the combine harvester's cabin. Find a suitable location in the cabin and fix the gateway unit securely. When the gateway unit is installed. Install the wiring between the gateway unit and the sensor unit. Make sure that the wiring is done securely and that the wiring is not subject to any damage.

Find a suitable location in the cabin for the display and install it. Finally, install the GPS receiver on the roof of the combine harvester. Make sure that the cable is not subject to any damage.

Safety Notice

Safety should always be your first priority. Use appropriate tools and follow all applicable manufacturer instructions during installation.

9. Operation Instructions

9.1. How does it work?

A dosing auger is installed close to a place where grain is flowing.

The GrainSense Combine Analyzer controls the auger and electronics to perform measurements in configured intervals. Measurements are being made until the user ends the measurement session. The measurements are collected by the gateway unit and sent via Wi-Fi network to the GrainSense Flow database. If a Wi-Fi network is not available during the measurement session, the data is saved in the device's memory and it is sent to the cloud, when Wi-Fi becomes available.

The user can access the GrainSense Combine Analyzer measurement sessions anytime from the GrainSense Flow -dashboard with the provided credentials.

9.2. Powering up the GrainSense Combine Analyzer

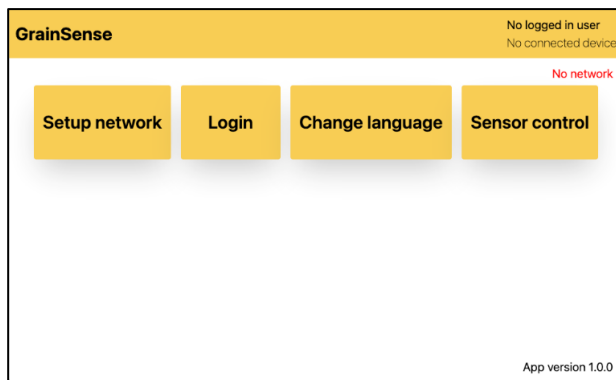
- 1) Turn the main switch ON from the GrainSense Combine Gateway unit.
- 2) Change display mode to HDMI in Touchscreen if HDMI is not already on.



Display mode selector marked with orange circle.



- 3) Wait until you see the landing page on the screen.





9.3. Network settings

GrainSense Combine Analyzer uses Wi-Fi network for Internet connection. To have the measurement results available real-time in the GrainSense cloud, Wi-Fi settings need to be configured.

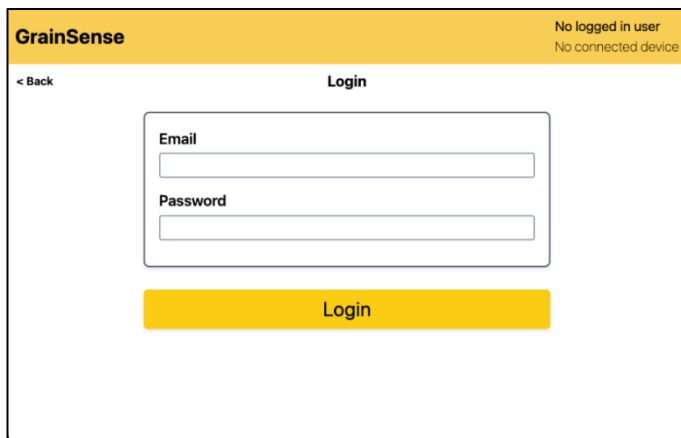
- 1) Go to **Setup Network**.
- 2) Press connect Connect to Wi-Fi -button
- 3) Select from available networks correct network.
 - a. Insert password for your network
 - b. If your SSID is hidden, insert also your SSID (name of your Wi-Fi network) and select the security type of your network.

Available networks		
NAME	SECURITY	SIGNAL
GrainSense	WPA2	📶
GrainSense	Open network	📶
GrainSense	WPA2	📶

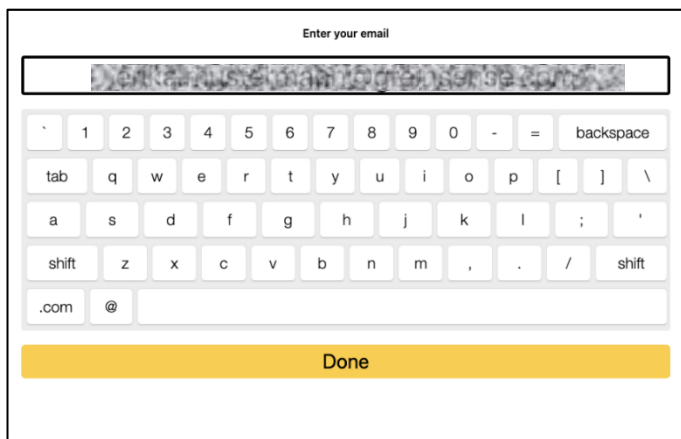
- 4) Tap **Connect**.
- 5) If screen shows established Wi-Fi network connection, press Back on upper left-hand corner.

9.4. Login

- 1) Press Login -button
- 2) Login with your registered user account and password



The screenshot shows the GrainSense login interface. At the top, a yellow header bar contains the "GrainSense" logo on the left and the text "No logged in user" and "No connected device" on the right. Below the header, there is a "< Back" button on the left and a "Login" title in the center. The main content area features a white box with two input fields: "Email" and "Password". Below these fields is a large yellow button labeled "Login".

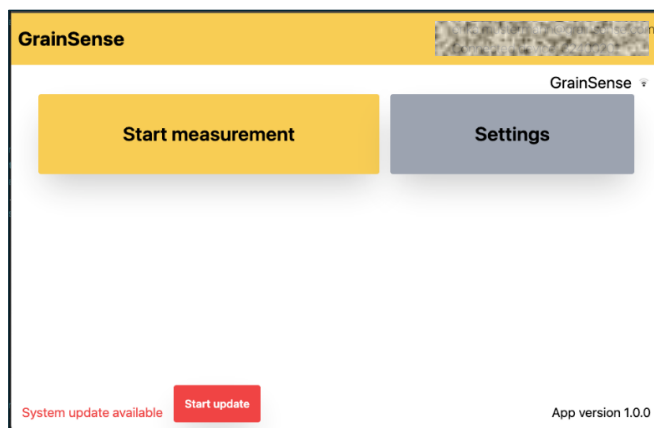


The screenshot shows the GrainSense email entry interface. At the top, a yellow header bar contains the text "Enter your email". Below the header, there is a white input field for the email address. Below the input field is a virtual keyboard with keys for numbers, letters, and symbols. At the bottom, there is a large yellow button labeled "Done".

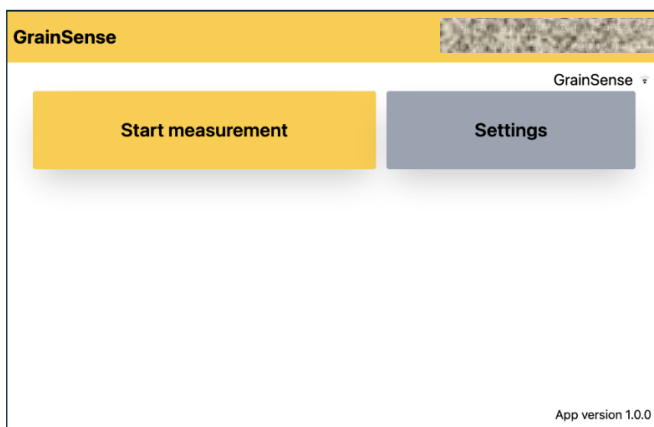


9.5. Check for updates

- 1) If there is on the bottom of the screen message on red that there is update available, download update by pressing Start update -button.



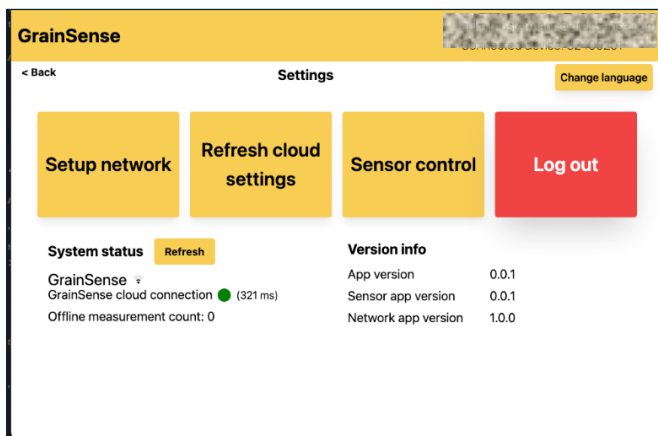
- 2) Confirm updating by pressing again Start update -button on following screen. "Update in progress" screen should appear. Wait for update and download completion and automatic restart of the GrainSense Flow Analyzer. During the update there are few different screens appearing and disappearing which are normal activity. After completion start-up screen should appear and GS Flow Analyzer is ready to use.



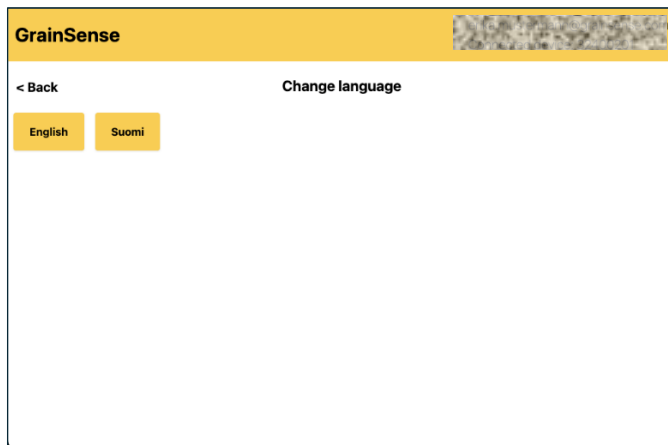


9.6. Language selection

- 1) Go to **Settings** → **Language**
- 2) **Select** the language you want to use with GrainSense Combine Analyzer. Click **Change language -button**.



- 3) Change language -screen:





9.7. Measurement settings

From the Start measurement main view, you can define measurement interval (how often the measurements are taken during measurement session)

< Back **Start measurement**

Measurement session name

Select calibration

Measurement interval (seconds)

Relay 1 control Not set

Relay 2 control Not set

- 1) Tap on the **Measurement interval** value box to change the interval. Use the DEL -button to delete the old value and type in the new value with the keypad. Then tap OK to confirm the new value.



9.7.1. Calibration selection

- 2) Go to **Select Calibration**
- 3) Select the calibration that you want to use for the measurement session.

The screenshot displays the 'Start measurement' interface. At the top left is a '< Back' button. The title 'Start measurement' is centered at the top. Below the title, there is a text input field for 'Measurement session name'. Underneath, the 'Select calibration' dropdown menu is open, showing a list of crop types: WHEAT (selected with a checkmark), BARLEY, RAPESEED, MAIZE, SOYBEAN, RYE, and OAT. To the right of the dropdown, there are two 'Change relay control' buttons. At the bottom of the screen is a large yellow button labeled 'Start measurement'.



9.7.2. Setting alarms/relays

- 4) Go to **Change relay control**
- 5) Define the desired alarm parameters by using the radio -buttons and define the alarm threshold value in the field. Then tap **Save**.

The alarm can be removed from the same dialog by using the **Remove relay control** button.

Relay control 1

Control relay with: ☒ Protein ☐ Moisture ☐ Oil

Change state if results: ☒ Higher ☐ Lower

than %

Hysteresis limit times to state change (min 5)

Control type ☒ One time trigger - keep the relay ON after first reach
☐ Alternate relay state change

Remove relay controlSave



9.8. Starting measurement session

After all the settings have been defined, the measurement session can be started.

- 1) Tap **Start measurement** button (if you are in Main view) and then from Start measurement view select **Start measurement**. One can also continue existing previous measurement session by tapping **Continue measurement** button.

The screenshot shows the 'Main view' of the GrainSense app. At the top, there is a yellow header bar with the 'GrainSense' logo on the left and a 'Connected device' field on the right. Below the header, there are three main buttons: 'Start measurement' (yellow), 'Continue measurement' (yellow), and 'Settings' (grey). The 'Continue measurement' button displays 'Wheat' and '5/31/2024 12:20:58 PM'. In the top right corner, there is a 'GrainSense' label with a dropdown arrow. In the bottom right corner, it says 'App version 1.0.0'.

Main view

The screenshot shows the 'Start measurement' view. It has a '< Back' button in the top left. The title 'Start measurement' is centered at the top. Below the title, there are three input fields: 'Measurement session name' (empty), 'Select calibration' (set to 'WHEAT' with a dropdown arrow), and 'Measurement interval (seconds)' (set to '1'). Below these fields, there are two rows for relay controls: 'Relay 1 control' and 'Relay 2 control', both currently set to 'Not set'. To the right of each 'Not set' label is a 'Change relay control' button. At the bottom of the form is a large yellow button labeled 'Start measurement'.

Start measurement view



- 2) In the measurement session -view, the user will see the following information:
- Selected calibration (e.g. wheat)
 - Latest protein and moisture percentage values
 - Average protein and moisture percentage values from the whole duration of the measurement session
 - If an alarm was defined in the settings, it will be displayed here
 - Duration of the measurement session
 - GPS signal availability (● GPS Ok, ● GPS not Ok)





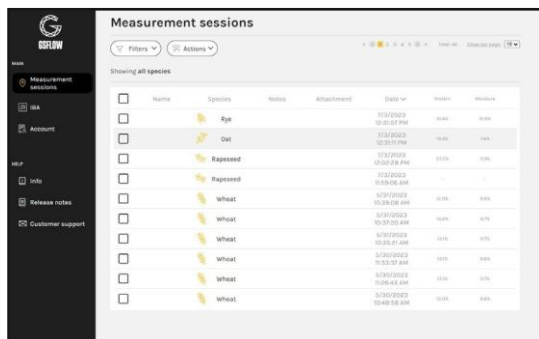
9.9. Stopping measurement session

When the batch of grain has been measured, the user can stop the measurement session by tapping the **Stop** button. After measurement has stopped user can exit from measurement by pressing **Exit** button.

9.10. Viewing results

The results are automatically uploaded to the GrainSense cloud. The user can log in and view the results in GrainSense Flow dashboard: <https://flowdashboard.grainsense.com/login>.

In GrainSense Combine dashboard, it is possible to add notes and attachments to measurement session export data and share the results via email.



The screenshot shows the 'Measurement sessions' page in the GrainSense Flow dashboard. The page has a dark sidebar on the left with navigation options: Home, Measurement sessions (selected), Risk, Account, Help, Info, Release notes, and Customer support. The main content area is titled 'Measurement sessions' and includes a 'Filters' dropdown and an 'Actions' button. Below this, it says 'Showing all species'. A table lists measurement sessions with columns: Name, Species, Notes, Attachment, Date, Time, and Moisture. The table contains 10 rows of data for various grain species like Rye, Oat, Rapeseed, and Wheat.

Name	Species	Notes	Attachment	Date	Time	Moisture
☐	Rye			17/12/2023	10:01:07 PM	92.9%
☐	Oat			17/12/2023	10:01:07 PM	74.4%
☐	Rapeseed			17/12/2023	10:01:07 PM	70.8%
☐	Rapeseed			17/12/2023	10:01:07 PM	70.8%
☐	Wheat			17/12/2023	10:01:07 PM	92.9%
☐	Wheat			17/12/2023	10:01:07 PM	92.9%
☐	Wheat			17/12/2023	10:01:07 PM	92.9%
☐	Wheat			17/12/2023	10:01:07 PM	92.9%
☐	Wheat			17/12/2023	10:01:07 PM	92.9%
☐	Wheat			17/12/2023	10:01:07 PM	92.9%

Please note that Individual Bias Adjustment (IBA) can be set from the Dashboard. For IBA update the touchscreen must be connected to the internet next time starting the session.



10. Registering to GrainSense cloud

1. Go to www.grainsense.com/pages/account-registration
2. Select the current product from the list

REGISTER TO GRAINSENSE

An account is required for using GrainSense Device and App. Please select the correct product from list below.

Select the correct product ▼

- Select the correct product
- Go
- Lab
- Silo**
- Combine

3. Select the “Combine”
4. Scroll down and click **Purchase now** - button on the GrainSense Flow user account license or **Activate now** depending on your license type.

GRAINSENSE SILO USER ACCOUNT LICENSE Included in the licence: - GrainSense Dashboard - Latest calibrations and updates to your GrainSense device and software - Updates to your Grainsense Silo device - Grainsense cloud service with unlimited storage for your measurements - Access to camera images when applicable Subscription is valid for 1 year	500€ (+VAT) per year PURCHASE NOW Product code GS-FLW-ACC-LIC-P1
GRAINSENSE SILO LICENSE PRE-PAID ONE-TIME PURCHASE LICENSE This One-Time Purchase License provides non-expiring access to the included GrainSense services and features. - GrainSense Dashboard - Latest calibrations and updates to your GrainSense device and software - Grainsense cloud service with unlimited storage for your measurements The subscription is valid for one Grainsense SILO Analyzer. Subscription will be linked to Analyzer serial number.	PRE-PAID One analyzer connected ACTIVATE NOW



5. Follow the instruction at the GrainSense webpages if license is **Pre-Paid One-Time Purchase License**.
6. In case of an annual license type, on the payment -page of the **Purchase now**, select the payment method. Check the I'm not a robot -box
7. (or alternatively, solve the reCAPTCHA challenge) and then click on the 'Register' - button.

REGISTER TO GRAINSENSE

PRODUCT :GRAINSENSE FLOW USER ACCOUNT LICENSE

PAYMENT

We partner with Paddle to handle software payments and billing. Paddle serves the checkout on our websites through which you place an order. Amongst other payment methods, Paddle handles wire transfers on our behalf. GrainSense cloud services are billed annually. Please check your spam box!

Paddle buyer [terms and conditions](#)

☐ Cards, Paypal

☒ Invoice(Bank Wire Transfer)*

*An invoice will be sent to your email.
Note! For US business clients, only the bank wire transfer is available on the invoice. For paying with card, please select cards as your payment method.

Price:

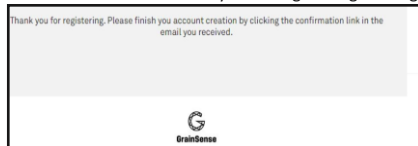
500 €

(+VAT) Per year. No additional costs.

☒ I'm not a robot 

Register

8. You should see the thank you for registering message.



9. Go to your email inbox and open the "Confirm your email with GrainsenSense" - message.



10. Click the 'Verify email' - button on the message.



Verify email address

Click the button below to verify email address and finalize the registration.

Verify email

11. You have now registered your account. You should see the confirmation message on your browser.

Account successfully verified.

Thank you for registering your GrainSense account!

You're almost ready to start using your new GrainSense Device. You will receive a welcome email shortly. If you have not purchased your device yet, you can [find your local distributor here](#).



Download GrainSense mobile app and log in



Start using your GrainSense device



Check your email for the invoice

(Note: Invoice will be sent by GrainSense or by an authorized GrainSense Distributor approximately within 30 days)

[Go to Login](#)

11. Maintenance and servicing

11.1. Preventive maintenance

We recommend cleaning the glass tube after every 20 h of operations.

Check the cables, connections, glass tube and lamp bulb annually.

If the lamp bulb or glass tube is broken, please contact your local distributor.

11.2. Cleaning the glass tube

The glass tube inside the sensor unit should be kept clean. Depending on the measured species and operating environment, the need for cleaning varies. We recommend cleaning the glass tube at least every fortnight, but a shorter interval might be needed.

To clean the glass tube, release the hose clamp on the output of the sensor unit. Remove the output tube and use the supplied brush. After the glass tube is clean, connect the output tube and tighten the hose clamp.

11.3. Updating the calibrations on the GrainSense Combine analyzer

When the GrainSense Combine analyzer is connected to the internet, it automatically checks and downloads new calibrations.

CONTACT

For any support, please contact your
local sales representative or
support@grainsense.com

www.grainsense.com