

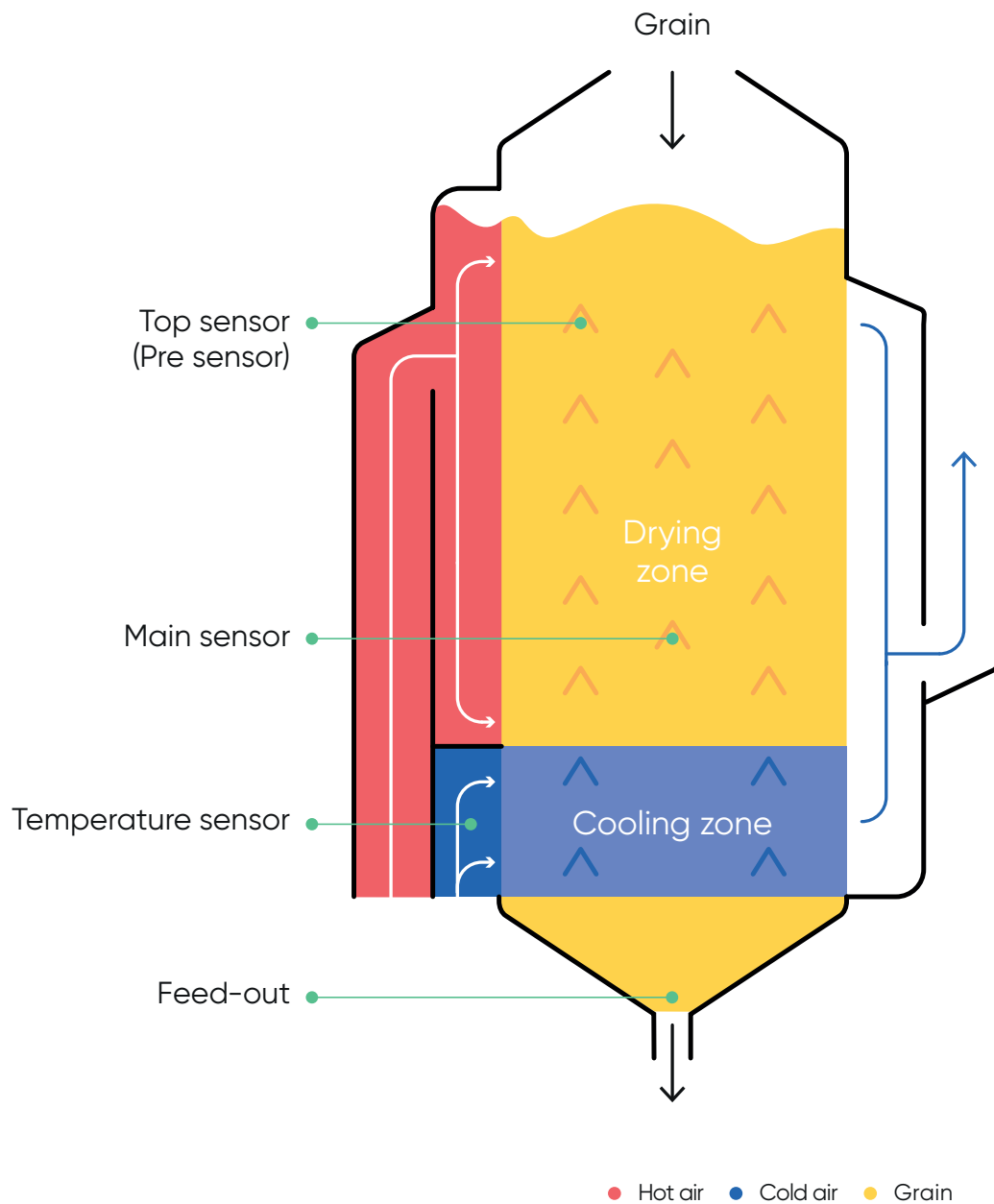


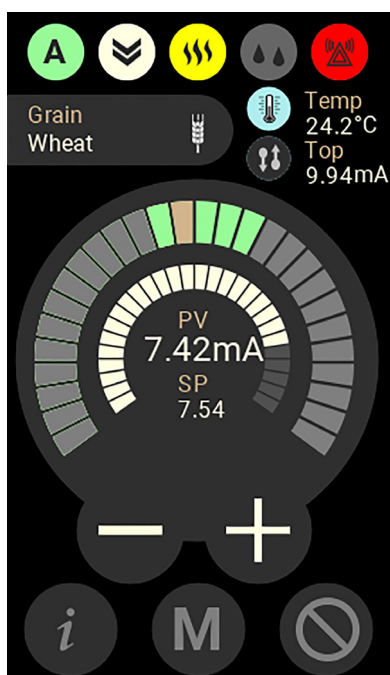
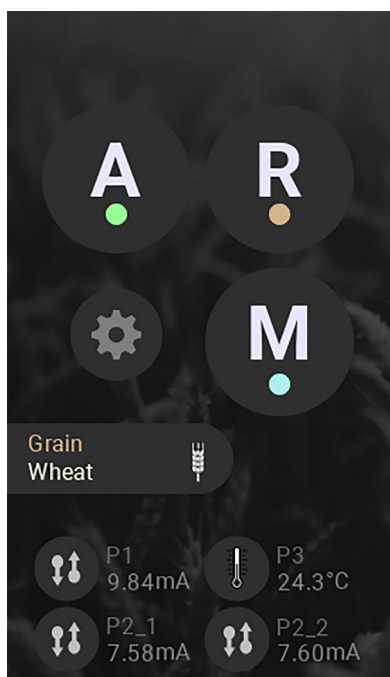
# Grain Control Drier AMY





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NB! Please read through all the features before start up.

Grain control Drier AMY controls feed-out speed for your grain drier depending on input from sensors and manual speed adjustments.

The user can operate the system from a screen in the control cabinet. It is turned on when it is connected and the system is powered up.

The grain control drier AMY has two main operating modes, manual (M) and automatic (A).

When in manual mode you make your own speed settings.

When in automatic mode, values from sensors and a derived SP value (set point) are used to determine feed-out speed. In case the water content in the commodity changes, the out-put speed will change as well.

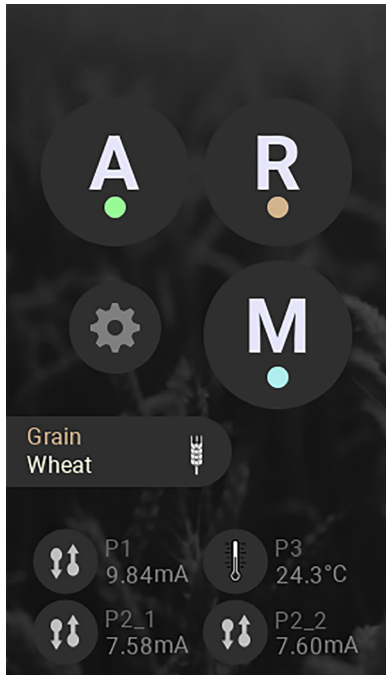
There is also a restart (R) mode for when a drying session has been stopped and need to be restarted. This mode restarts the drying session in manual mode but switches to automatic mode (A) when manual mode has been running for a set time.

Derived SP values for different grain types are stored in a grain selection list to be use as pre settings.

A data graphs page displays sensor values as function over time.

Settings for feed-out time and pulses (pulse-feed out) can be adjusted.

With one or two extra sensors, accessory features can be achieved to compensate for varying cooling air temperature and/or varying moisture content in the in-take commodity.



## Start page

The start page is shown when the screen is connected and the system is switched on. Press the buttons to go to the different features:

**A:** Automatic mode

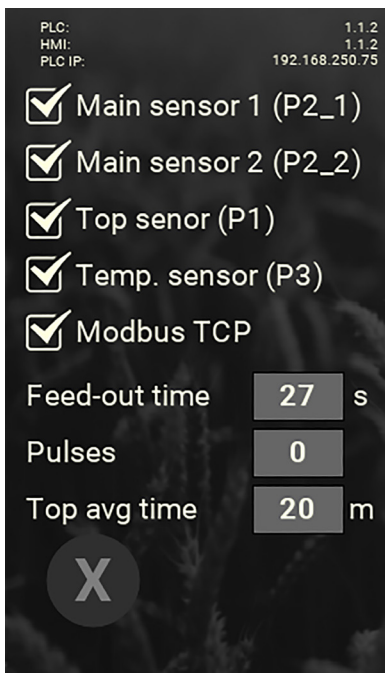
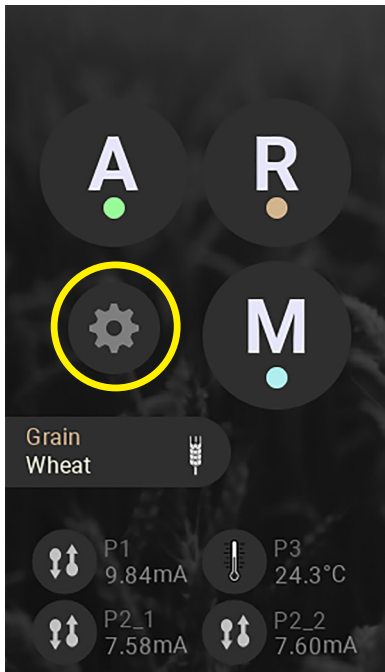
**R:** Restart mode

**Gearwheel:** System settings

**M:** Manual mode

**Grain:** Grain selection list

**Displayed data** from the different sensors installed.



## System settings

The system settings page contains a list of components and the ones installed in the system should be ticked for activation. Settings for feed-out time, pulses (pulse feed-out) and if applicable top sensor (pre sensor) can be adjusted here.

Adjustment to a setting can be made by typing a value in the box.

### Default settings are:

**Feed-out time** = 27 sec

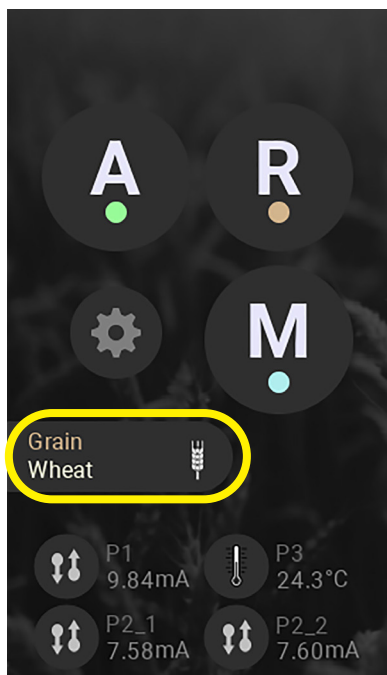
This value is the fixed time for each feed-out.

**Pulses** = 0

For discharges with puls feed-out, adjust how many pulses per Feed-out time.

**Top avg time** = 20 min

For accessory top sensor (pre sensor), please refer to section "Compensation for varying moisture content".



## Grain selection list

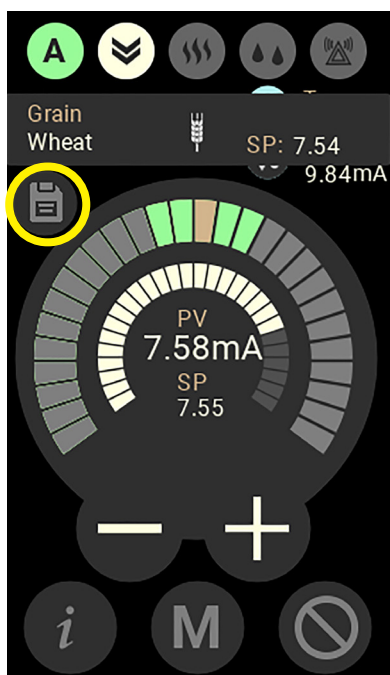
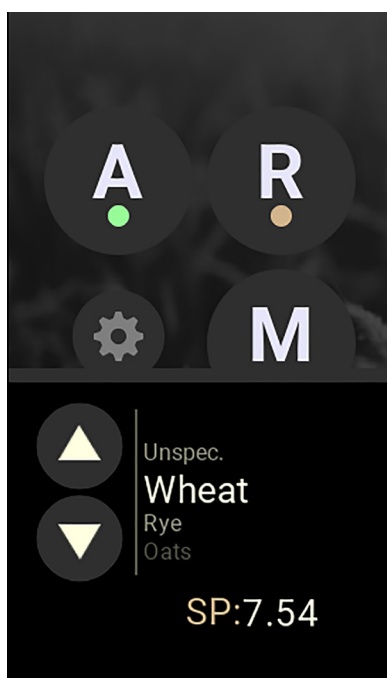
The Grain selection list stores the SP value (set point) for different grain (commodity) types.

To be able to store, or select a stored SP value to be used in automatic mode (A), you have to select a grain type before you start a drying session. On the Start page, press the "Grain button" to select the grain type.

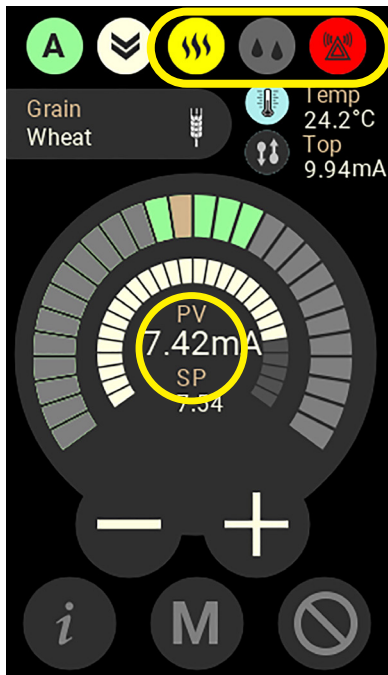
NB! There is one unspecified choice listed as "Crop/Unspec." in case your grain (commodity) type is not listed.

### Store the SP value to the "Grain selection list"

When in automatic mode (A) and the desired moisture content is reached, you should store the SP value to the "Grain selection list". Press the "Grain button" and a "Save symbol" will appear. Press the symbol and the SP value will be saved to the selected grain (commodity) type.







## Alarms

There are three different types of alarms:

**Commodity too dry:** The dry symbol lights up yellow and the triangle symbol lights up red. Only shows when in automatic mode (A).

**Commodity too wet:** The wet symbol lights up blue and the triangle symbol lights up red. Only shows when in automatic mode (A).

NB! If this alarm is present throughout 6 consequent feed-outs the drier will turn off. A restart where adjustment of the speed/ SP (Set point) value must be done. Please refer to the sections "Manual mode", "Automatic mode" and "Restart mode".

**Component failure:** Only the triangle symbol lights up red. Shows in all the operation modes (M, A & R).

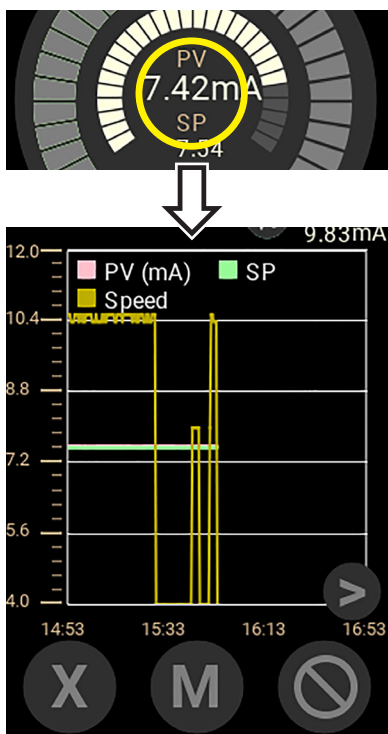
## Data graphs page

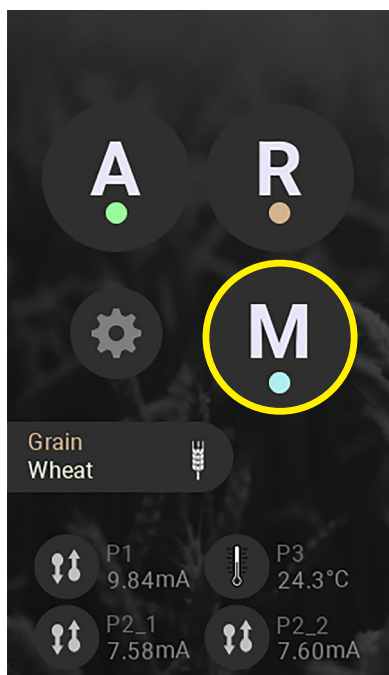
The data graphs page displays sensor values as function over time.

To view the page press on the PV value when i operation mode (M, A or R).

Scroll in the graphs by swiping with a finger.

Press "Arrow symbol" to return to present value.





## Manual mode

Start up a new drying session in manual mode (M).

Drying times are simply set with a percentage value that shows how much of the time the feed-out is running.

Example: If speed is set to 25%, the feed-out is active 25% of the time and inactive 75 % of the time. If the feed-out time is set to 27 seconds it means that it is active in 27 (25%) seconds and inactive in  $27 (25\%) \times 3 (75\%/25\%) = 81 (75\%)$  seconds.

Set a time with a percentage that is considered suitable for your drier, commodity and water content. Ask your drier supplier for the appropriate setting.

NB! It is recommended to move the dried commodity to a wet-bin so that damp commodity can continuously be fed into the drier.

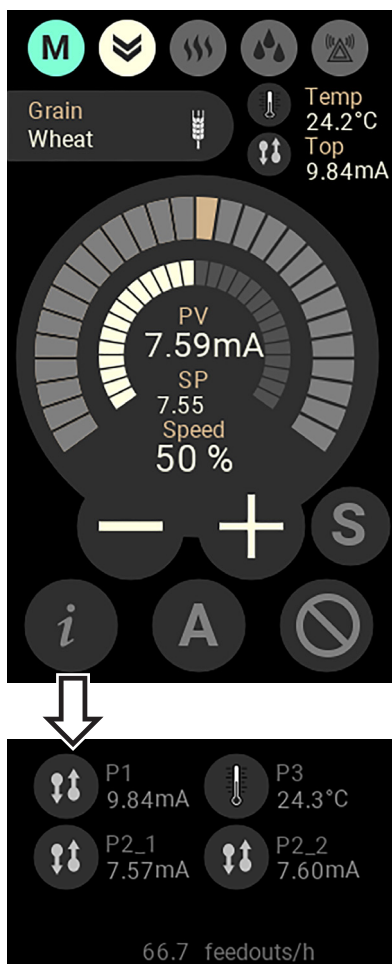
Check the moisture content regularly. If the outgoing commodity is too wet, lower the percentage. If the commodity is too dry, raise the percentage. Adjusted with the plus and minus buttons.

### Switch to automatic mode

When the desired moisture content is reached switch to automatic mode (A) by either:

pressing (S) and the system will go to automatic mode with a SP value (set point) corresponding to the speed setting in manual mode.

Or press (A) and the system will go to automatic mode with the stored SP value chosen from the "Grain selection list" before starting the drying session. For more information on how to store SP values please refer to the sections "Grain selection list" and "Automatic mode".



**Feed-out symbol:** White when feed-out is active.

**Dry/Wet/Triangle symbol:** Alarm! Please refer to page 9.

**PV (present value):** Value from the main sensor (inductive).

**SP (set point):** Value from the selected grain.

**Speed:** Displays feed-out time in percentage of 100%

**-** : Decrease time spent in feed-out = drier commodity.

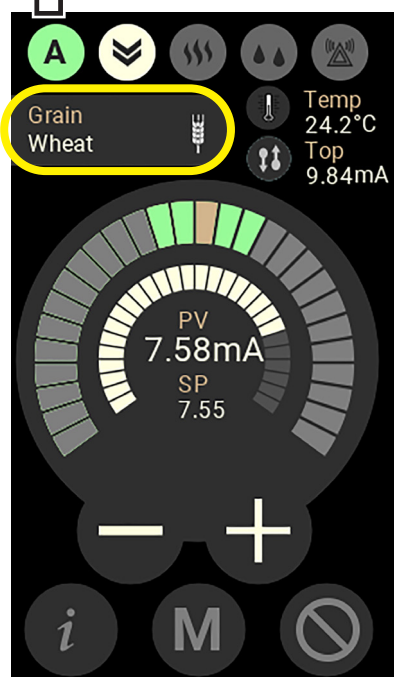
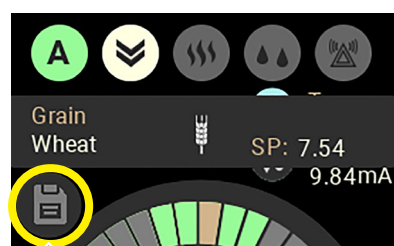
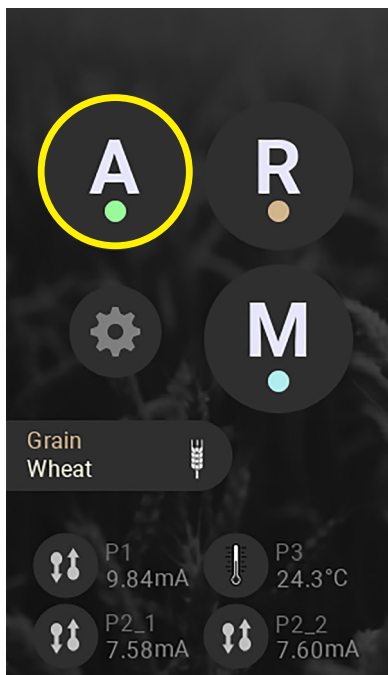
**+** : Increase time spent in feed-out = wetter commodity.

**S** : Go to Automatic mode with a SP value corresponding to the speed setting from the manual mode.

**A** : Go to Automatic mode with the SP value for the selected grain (selected before the drying session was started).

**i** : Displays values for sensors installed and feed-outs per hour.

**Cancel button:** Back to start page.



## Automatic mode

In automatic mode (A) the system internally manages drying times with the help of the PV value (present value) from the main sensor/s and the SP value (set point).

Different types of commodities with the same moisture content will have their own SP value for optimal drying.

Normally, the SP value should be between 5.00- 8.00, but deviations can occur.

A lower value = drier commodities like oil seeds or commodities with a lot of shells, like oats.

A higher value = wetter commodities with less shells, like wheat.

If, when checked, the water content is not the desired, the SP value can be adjusted with the plus and minus buttons.

**Important!** Never adjust the SP value more than 0.20 units at a time.

After adjusting the SP value, let the drier run for at least one hour before checking the moisture content again and if needed make further adjustments.

### Store the SP value to the "Grain selection list"

When the desired moisture content is reached, you should store the SP value to the "Grain selection list". Press the "Grain button" and a "Save symbol" will appear. Press the symbol and the SP value will be saved to the selected grain (commodity) type.

NB! It is only possible to store one value per grain (commodity) type.

**Feed-out symbol:** White when feed-out is active.

**Dry/Wet/Triangle symbol:** Alarm! Please refer to page 9.

**PV (present value):** Value from the main sensor (inductive).

**SP (set point):** Corresponding value to the speed setting used in manual mode if entering automatic mode via (S).

The value for the selected "Grain" (selected before the drying session was started) if entering automatic mode via (A).

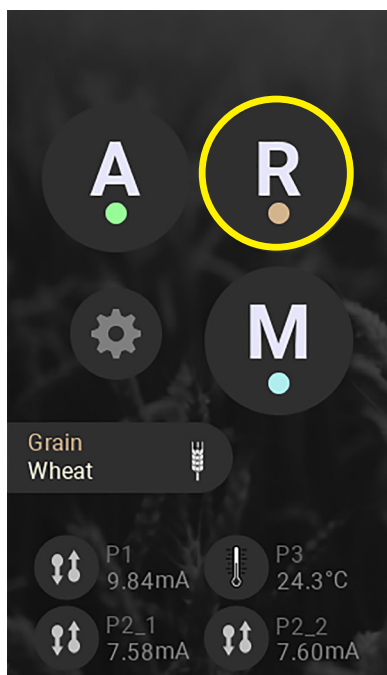
**-** : Decrease SP value = drier commodity.

**+** : Increase SP value = wetter commodity.

**M** : Go to Manual mode.

**i** : Displays values for sensors installed and feed-outs per hour.

**Cancel button:** Back to start page.



## Restart mode

Restart mode (R) is applied when the drying session has been stopped and need to be restarted.

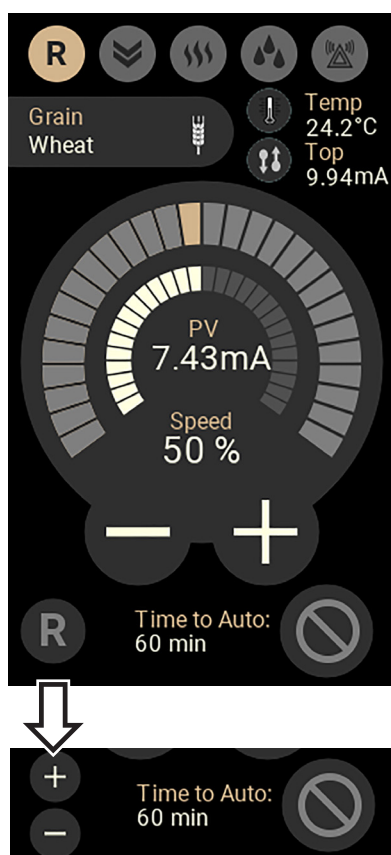
The restart mode runs for a set time (default setting is 60 min) with the setting from the previous manual mode session, and then switches to automatic mode(A) with the setting for the previous automatic mode session.

When restart mode is applied the speed setting cannot be changed. If needed, cancel restart mode and go to manual mode to make the adjustment.

Return to restart mode and a new restart-sequence will run with the adjusted manual mode speed setting.

### Set the operating time for the restart mode

Set how long restart mode (R) should run before operation switches to automatic mode (A). Press the "R button" and then adjust with the plus and minus buttons. The time is displayed under the heading "Time to Auto".



**Feed-out symbol:** White when feed-out is active.

**Warning symbols:** Please refer to page 9.

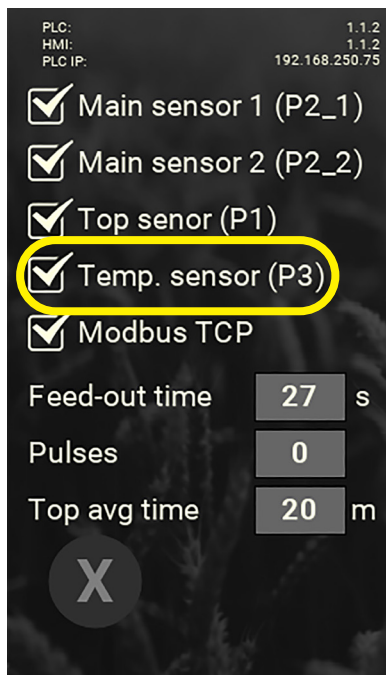
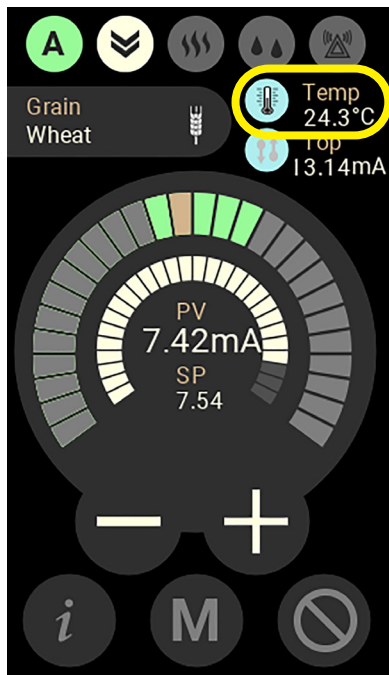
**PV (Present value):** Value from the main sensor (inductive). There are one or two installed.

**Speed:** The speed setting from the last manual session, cannot be adjusted in this mode. If needed, cancel this mode and go to manual mode (M) to make the adjustment.

**-/+ :** Adjustments cannot be made in this mode.

**R :** Press to change how long restart mode runs before operation switches to automatic mode (A). Default setting is 60 minutes.

**Cancel button:** Back to start page.



## Compensation for varying cooling air temperature

This feature compensates for varying cooling air temperatures and the feed-out will continuously keep an even moisture content regardless of the cooling air temperature.

When the cooling air temperature drops below +25° the system will internally lower the SP (Set point) value, and the commodity moves slower through the drier and vice versa if the temperature rises from lower temperatures (up to +25°).

To get this feature:

- a temperature sensor must be installed in the in-take for cooling air.
- the feature must be activated, go to "System settings" and tick the box for the "Temperature sensor".

When everything is installed, the temperature is displayed on the start page, on the information page (i) and in the different operation modes (M, A & R).

NB! This compensation feature is only active while in automatic mode and only between +25° to +5° and while it is active the temperature symbol lights up blue.

NB! The SP value displayed will not change according to the internal compensation.



## Compensation for varying moisture content in the in-take commodity

This feature compensates for varying moisture content in the in-take commodity and the feed-out will continuously keep an even moisture content regardless of the in-take moisture content.

When the moisture content varies considerably from the expected the system will internally change the SP (Set point) value, and the commodity moves either slower or faster through the drier.

To get this feature:

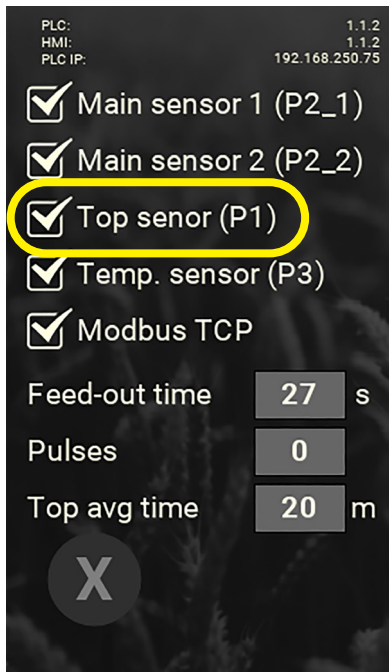
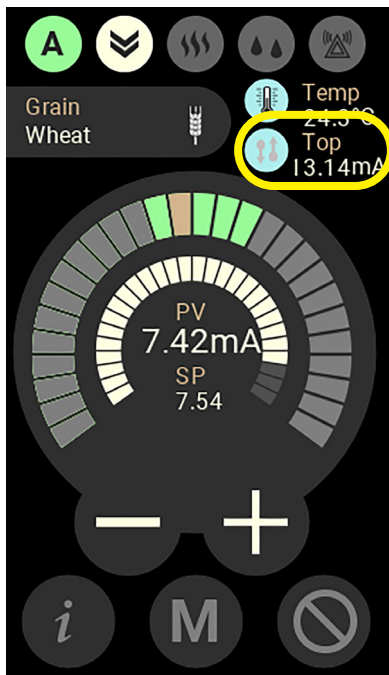
- a top sensor (inductive sensor same as main sensor) must be installed.
- the feature must be activated, go to "System settings" and tick the box for the "Top sensor".

When everything is installed, the value is displayed on the start page, on the information page (i) and in the different operation modes (M, A & R).

NB! This feature is only applied in automatic mode. The sensor symbol lights up blue while the compensation is activated.

The sensitivity for when the compensation should be activated can be adjusted if needed, go to "System settings" and change the "Top avg (average) time". The value 20 (minutes) is a default setting, less time will increase the sensitivity and more time will decrease the sensitivity .

NB! The SP value displayed will not change according to the internal compensation.





# Grain Control

Part of GrainCloud

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