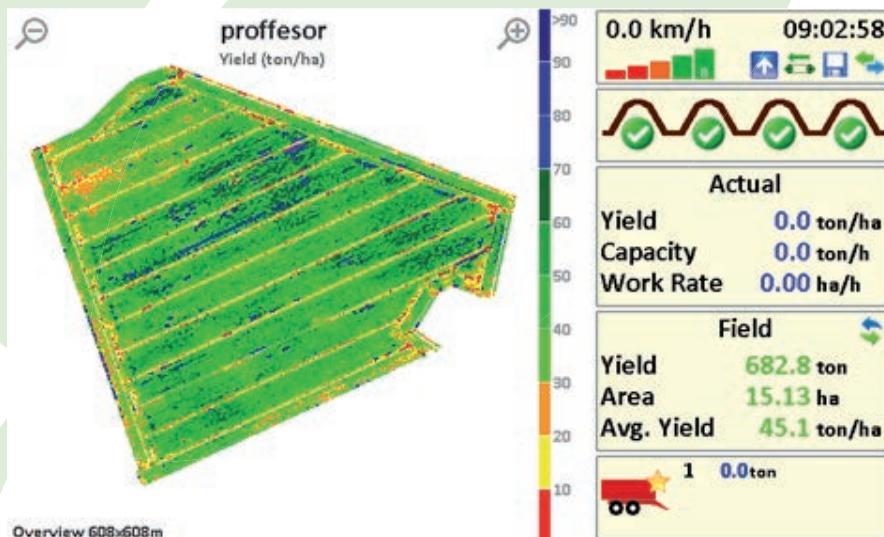# vantage

powered by **agrometius**

YieldMaster PRO
Universal Yield Monitoring System

Version 3.0
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⚠️ These instructions must be made available to all persons involved with the installation, commissioning, operation, maintenance and repair of this product.

Title:	YieldMasterPRO User Manual
Document version:	Versie 3.0, Augustus 2019
Part of:	YieldMasterPRO 2019

Haverster Details
Make and type:
Serial number:
Year of construction:

YieldMasterPRO Details
Serial number:
Software version:
Options

Dealer

Content

1.   General description

The YieldMasterPRO system is a yield measuring system for agricultural products such as potatoes. It determines the yield by weighing the product. The product yield is determined based on data from the load cells and the flow of the product. By coupling the yield to the GPS data, it is possible to create a map. The load cells are attached below the reading table and replace a running wheel of the existing harvester. The load cells are connected to a touch screen where all information is processed. The data are visually displayed on the touch screen. The data can be exported to the USB stick and the created .csv files can be loaded into Excel or a Farm Management Program. The data are also saved on the SD card at the rear of the terminal.

1.1   Intendend use

YieldMasterPRO is intended for measuring different crop yields, such as potatoes. The system uses GPS and EGNOS for creating a yield map. The manufacturer has no influence on the accuracy of GPS and EGNOS and cannot be held liable for this.

1.2   Warranty

The manufacturer (Vantage Agrometius B.V.) gives a warranty on materials and constructional errors for a period of 12 months after delivery of the YieldMasterPRO. The manufacturer accepts no liability for direct or indirect damage caused as a result of using the system, or as a result of temporary non-functioning of the system. In the latter case, the manufacturer will do his utmost to limit the period of standstill as much as possible. The manufacturer does not accept liability for damage to or malfunctions in devices or machines that occurred during or after using the YieldMasterPRO system.

2.   Safety

The YieldMasterPRO system was designed and constructed in accordance with the applicable technical rules and regulations.

⚠️ Always switch off the engine and activate the manual brake when the system is being maintained.

At all times, the user of the system is responsible for ensuring a safe usage of the system.

3.   Maintenance, safety, cleaning and storage

ℹ️ Correct use, maintenance and cleaning as well as a regular inspection of the system could prolong the life span of the system. Therefore, carefully read the instructions below to prevent problems and improve your enjoyment of the system.

3.1   Maintenance

⚠️ Maintenance and repairs should always be performed by competent persons. Never perform repairs to the system if you are not sure that you are able to perform them. In case of doubt, always consult your dealer.

⚠️ In case of welding work on the machine, always interrupt the power supply to the YieldMasterPRO system to prevent damage. Preferably remove the battery clamps from the battery. Place the earth clamp of the welding device always as close as possible to the component to be welded.

When maintaining the YieldMasterPRO system, always observe the following instructions:

- Always perform maintenance when the engine is switched off and the manual brake has been activated. Remove the key from the ignition.

- Make sure the machine is clean and dry.

- When working on the electrical installation, the power supply must always be shut down. Preferably, remove the connections to the machine's battery.

3.1.1   Daily maintenance
- Check the system for contamination and clean it if necessary. Here, observe the cleaning instructions (section 3.2).
- Check sensors and actuators (cylinders, electric motors, etc.) for damages. If damages are established, these must first be remedied before you start working with the system.

3.1.2   Weekly maintenance

- Check the wiring and plug connections for damages. If damages are established, these must first be remedied before you start working with the system.

3.2   Cleaning

The components of the YieldMasterPRO system are dust- and splash-proof and are suitable for use under outdoor conditions. Take the following aspects into account when cleaning the system:

- Only clean the operating terminal with a clean, soft and dry cloth.

- The other components can be cleaned with a clean, soft and moist cloth.

- When using a high-pressure cleaner, make sure that the spray is never directly aimed at the operating terminal, sensors, actuators and plug connections.

- Never use aggressive detergents.

3.3   Storage

Make sure that the machine and the YieldMasterPRO system are stored in a clean and dry room. If the system is stored for a longer period, we recommend removing the operating terminal from the system.

4.   Components of the system

The YieldMasterPRO system is integrated into the harvester. The most important components are the load cells, display and GPS receiver.

Display – The display for the communication with the load cells is located in the cabin.

GPS receiver – On top of the cabin you can find the antenna that is used as a receiver for the GPS and EGNOS satellites. The system can determine its position on earth based on these data.

Load cells – The load cells are located under the reading table. These will weigh the product that passes the belt. By using a sensor, the flow can be determined. Based on these combined data, a yield map can be created.

5. Operating the system

The YieldMasterPRO system can be operated by means of the touch screen. The terminal can be mounted on a tube in the cabin. The position of the terminal can be varied.

On the left side of the terminal you can find the on/off switch. By pressing the press button, the screen will start up and the start page will appear (Figure 1).

Figure 1. Start-up screen after power on.

The start screen has four symbols: Export, Maps, Settings and Start. The three symbols on the left will be discussed in more detail further down in this document. In order to start the measurement, you press the Start button. Now you must choose whether you want to continue an existing field, or if you want to create a new field (Figure 2):

Figure 2. New or existing field selection

By using the green arrows, you will be able to switch between the fields. Once you have selected the correct field, you

can click on Load Field. If you want to create a new field, click on New Field. You can now enter a name for the new field Figure 3.

Enter field name

Figure 3. Entering a field name

It is possible to enter a field name. By means of the blue arrow you can select between capitals and lower-case letter and once you entered the name you can press the green V. The main screen will now appear.
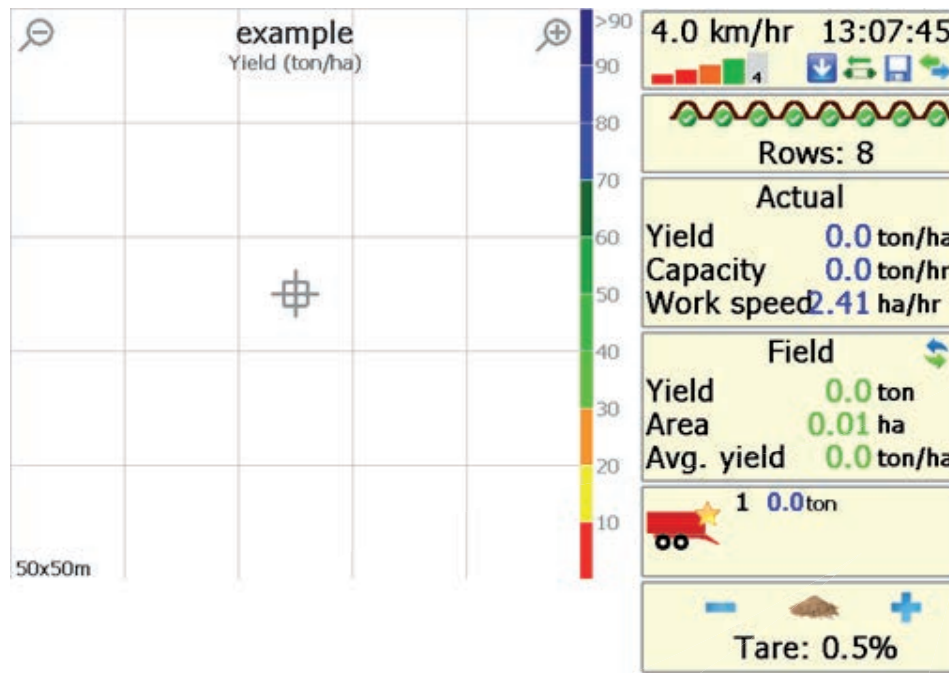
5.1   Main screen

Figure 4. The main screen (empty field named 'example').

Figure 4 shows the main screen. The yield is displayed on the left side and the machine settings on the right.

The position of the harvester is shown in the middle of the field. On the right side you can see the legend with the different colours for the different yields. For zooming in and out, you can press the zoom in and zoom out buttons in the top of the map. The dimensions of the map are shown at the bottom. New data are continuously saved in the map. Once the maximum zoom level has been reached, the new data are still stored but are no longer displayed.

On the right side, the system information of the harvester is displayed. The information consists of, for instance, driving speed, GPS position, time and the communication with the harvester. The GPS position is OK if at least one green bar is visible. In the case of two green bars, the correct EGNOS signal is also included in the place determination. If the GPS quality is below the minimum required GPS quality, yield logging is disabled, and the GPS reception indicator starts blinking. The other symbols indicate the machine status.

Under the harvester information it is stated how many rows are being harvested. If, for example, you only harvest two of the four rows, you must press this button twice. You will see that the number of rows is reduced to 2. The system will automatically reset the number of rows if the harvesting mouth of the machine is lifted.

Under the heading Actual, you will find information about the yield. By clicking on the bended arrow, the day and season yield is shown.

The box containing the small tipper image presents the number of loaded tippers. If a tipper is full, you must press the Add Tipper button. Once the weight on the tipper has been weighed, you can later enter the weight of the tipper in the Calibration screen. The system will automatically correct the yield of the field. The system remembers the last 12 carts for the benefit of calibration. It is recommended to enter the weight of the tipper regularly.

At the bottom the tare percentage can be adapted by pressing the '+' and '-' buttons. The tare percentage is the difference in net yield of your daily and field yield and the raw yield of the tippers. The tipper yield still contains the tare and for calibration purposes this is not corrected with the tare percentage. The field/daily/season yield is tare corrected by the tare percentage.

5.2   Menu

In order to enter the menu, you can press System Information in the top right.

Figure 5. Menu

The menu has 6 symbols

Log: Press this symbol to start a new field or to continue an existing field. A screen similar to figure 3 will appear.

Info: Press this symbol to get system information or to reset the season's yield. The next screen will appear:

Figure 6. Information window

In order to reset the season's yield, you must press this button (only do this at the start or end of the season!). Press anywhere on the screen to return to the menu screen.

Shut down: Hold this button down for three seconds to return to the start screen (Figure 1).

⚠️ Always use the shutdown button when shutting down! Or else no data will be saved on the SD card! Communication: Press Communication to check that the data from all sensors are arriving correctly. This information is for service purposes.

Calibration: This button is used to calibrate the system. Read chapter 7 for the details.

Main Screen: Use this button to return to the main screen (Figure 1).

6.   Starting

The system is very easy to use. Switch on the system, press Start and Create a new field. The main screen appears (Figure 4).

⚠️ Before you start harvesting, check that all signals are arriving correctly and that the GPS is OK. At least one green bar should be visible. The communication symbol (symbol furthest to the right) must be blue/green.

⚠️ If you are using the system for the first time, make sure a calibration has been performed. For more information, read section 7.1

Once the calibration has been completed, you can start using the system.

ℹ️ Calibrate your system at least once per week.
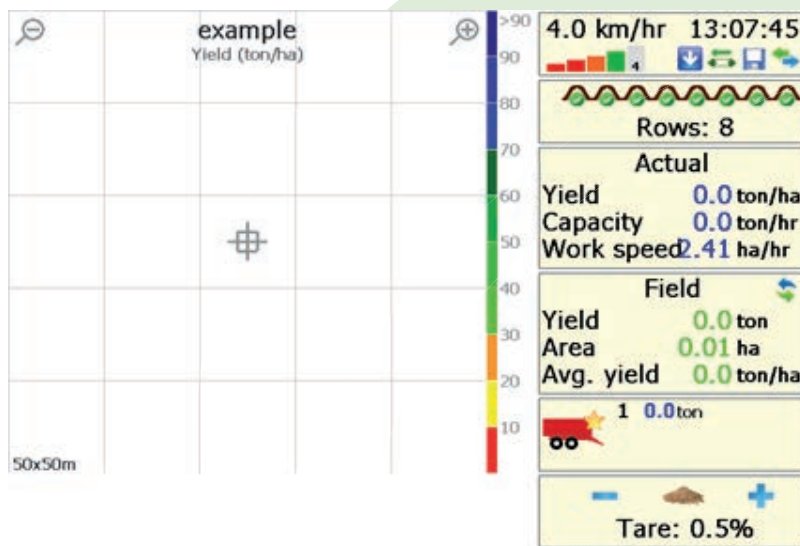
Figure 7. Main screen of the harvester. Caution: the dots are drawn behind the harvester, because it takes a few seconds before the potatoes are coming over the reading belt.

Regularly check during harvesting that the yield is within the scale. If the yield is too low or too high, perform a calibration, section 7.1.

Once a trailer is full, press the bottom right Tipper button.

Once you have finished harvesting, press down the shutdown button in the Menu screen for 3 seconds.

7.   Calibration

In order to measure the yield accurately, it is necessary to calibrate the system. There are two types of calibration:

1.   Offset calibration (empty belt)
2.   Scale calibration (load weight)

7.1   Offset calibration (empty belt)

This calibration takes place after the system has been installed, and in case of substantial changes in the weight of the belt (think of extra mud attached to the belt at the load cells).

The system uses load cells below the conveyor belt to record the weight. Because the conveyor belt rests on the load cells, the weight of the conveyor belt must be subtracted from the total weight. In order to calibrate the weight of the belt, an offset calibration is used.

In order to perform an offset calibration, you must go to Menu (Figure 4) and press Calibration. The calibration window appears (Figure 8). Then press Calibrate Offset (empty belt) (Figure 9).
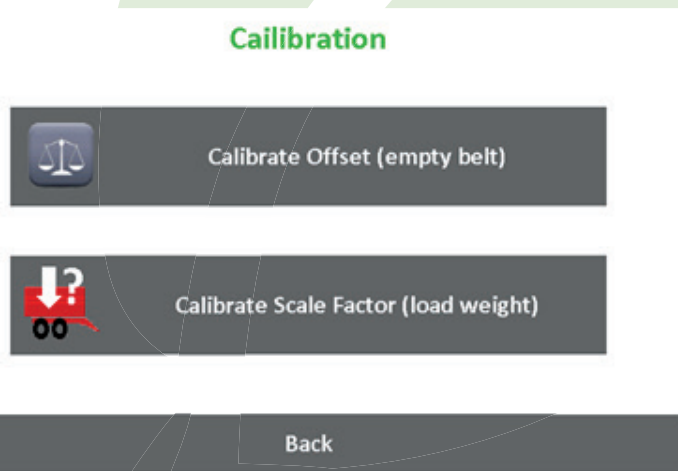

Figure 8. Calibration menu

Calibrate Offset

Current Offset   22.90
Calibrate Offset   N/A

▶ Start Calibration

Back
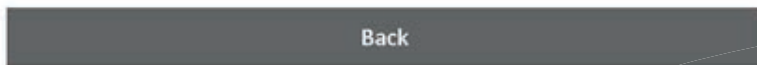
Figure 9. Offset Calibration

In order to start the calibration, start the harvester and let it run without any product on the belt. Press Start Calibration to start calibrating.

Calibrate Offset

Current Offset   0.00
Calibrate Offset   26.51

⬛ Stop Calibration

✖ Abort Calibration

Back

Figure 10. Offset Calibration is active.

The system will now calculate the average weight of the belt. Allow the belt to run for approximately one minute. The calibration number will become more stable in due time. Once the number is stable, press Abort Calibration and the offset calibration has been completed.

7.2   Scale calibration (load weight)

This calibration takes places directly after the system is installed. The scale calibration doesn't need to be performed on a regular base. Only when the field total is considerably higher or lower than the system, you should perform the Scale factor calibration. Please contact your dealer when in doubt.

The system uses the driving speed, working width, speed of the belt and the information provided by the load cells. First, the net weight of the product is determined based on the offset calibration. This value is then calculated with other information in order to record the actual product. A scale calibration factor is used to calculate the different units. In order to change this variable, go to Menu --> Calibration --> Calibrate Scale Factor (load weight):
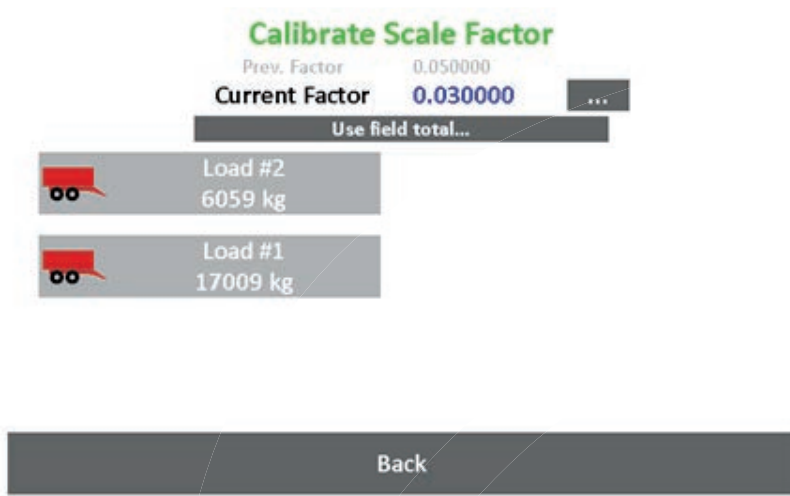

Figure 11 Scale calibration

The scale variable is shown in Figure 11. If this value is too low, the measured production will also be too low, and if it is too high, the measured production will be too high.

There are three ways to calibrate the scale factor. 1) Manual, 2) On the basis of measured weight, 3) based on the total field.

Manual calibration (expert method):
The scale factor can be adapted by clicking on the button with the 3 dots. If the measured weight is too low, lightly increase the factor. If it is too high, do the opposite.

Calibration based on measured weight (recommended method):
The system can calibrate based on measured weight. In order to perform this action, you will need a weighbridge (or something similar). This weighbridge will determine the 'actual' weight of the trailer. As the system can keep track of the weight of six production carts, you can use the 'actual' production weight to set the calibration weight (calibration). If the actual weight of the trailer is known, select the weight of the same trailer in the list in figure 12. The system will ask for the total weight (in KG) and will settle this automatically with the weight of the cart and determine the scale factor based on this.

Calibration based on the total field (alternative method):
If the 'actual' weight of a field (combined with the weight of all trailers on the weighbridge) is known, you can use the 'Use field total...' button. Once you have finished harvesting, click on the button and enter the 'actual' weight of the field. The system will now automatically determine the scale factor.

8. View, clean up and export yield maps

The system keeps track of all yield information on the SD card in the terminal (display). These data can be viewed and exported to a USB stick.

8.1 View yield maps

In order to view yield maps recorded earlier, go to the main screen (figure 2), press Yield Maps and select the required field:
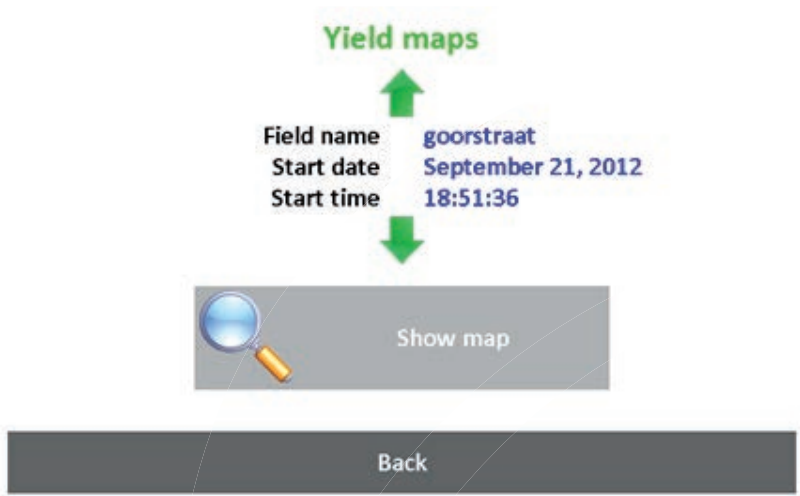
Figure 12. Map selection

After pressing Show Map, the yield map and other data are displayed.
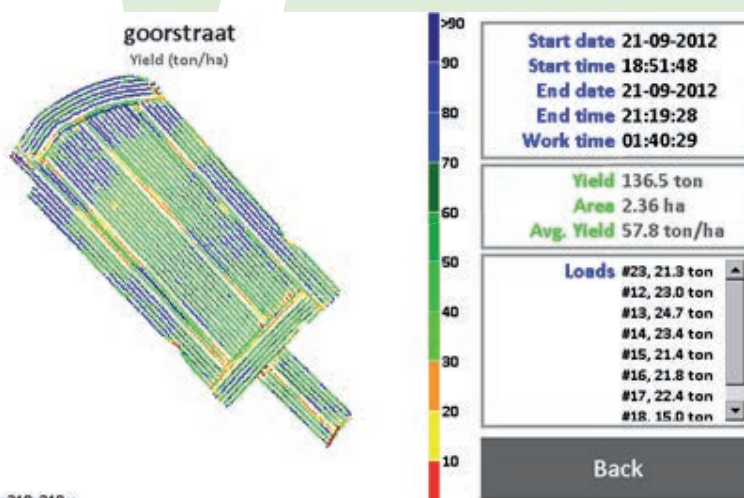
Figure 13. Yield Map showing

8.2 Clean up and export yield maps

During harvesting, the YieldMasterPRO keeps track of information about the harvest in a temporary file. When a field is closed (by clicking on 'shut down' or opening a new or existing field), the system will save the harvest information in a .csv file (comma separated values). These .csv files can be exported to a USB stick.

Files

Insert USB drive and press Export to transfer files

Export

Clean up files

Back

Figure 14. Files window.

In order to clean up a file you press Clean up files and wait for it to finish. All unnecessary files are deleted and 'lost' yield maps are retrieved.

In order to export a yield map to a USB stick, insert a USB stick in the terminal (display) and press Export. All .csv yield maps are now exported to the main folder of the USB stick. Once this is completed, the system will ask whether the .csv files may be removed from the SD card.

The log files can also be directly accessed on the SD card. Remove the SD card from the terminal (display) and insert it in a card reader of the computer. The .csv files are in the 'Log' folder.

# 9.	Adjusting settings

System variables are saved on both the terminal (display) and the YieldMasterPRO controller. These settings are accessible via the start-up screen Figure 1. Press Settings and the following window will appear:
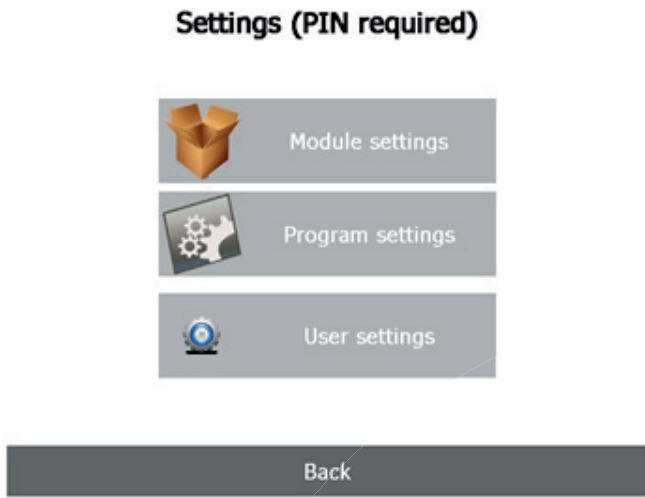
Figure 15. Module (Controller) settings, Program (terminal) settings and User settings.

## 9.1	User settings

Select the button User settings to access the two settings adjustable for the convenience of the user. Figure 16 presents the two adjustable parameters: Brightness of the screen and Sound volume of the application beep. The percentages can be adjusted, by pressing on the symbols on the left or right of the parameter.
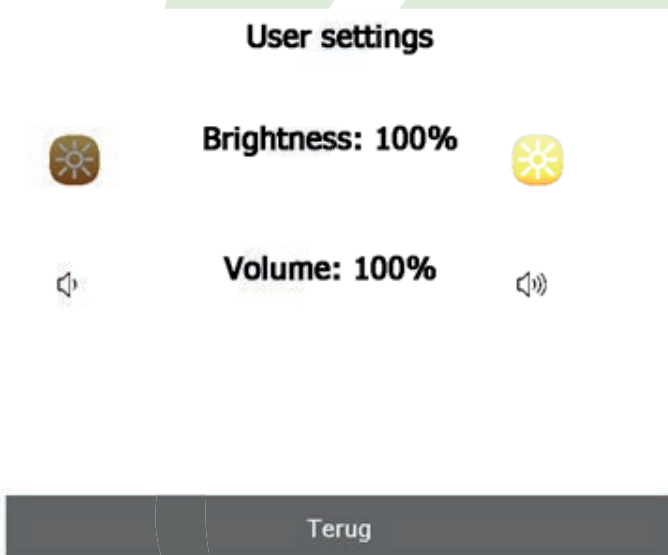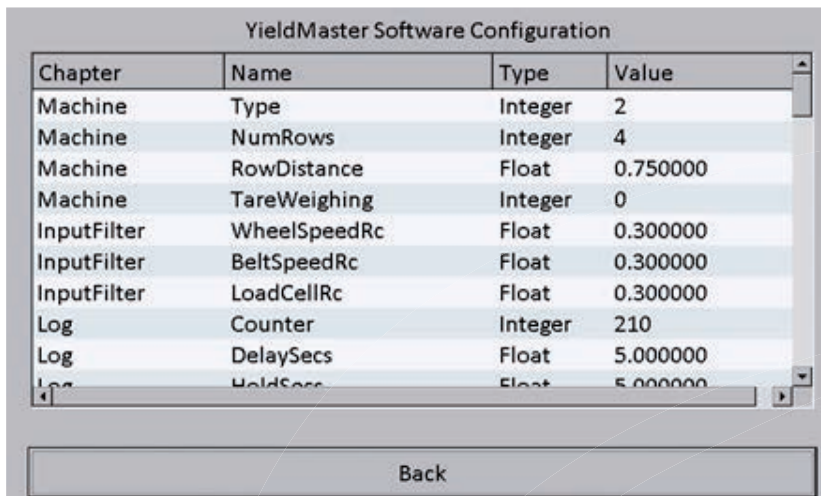
Figure 16. User settings.

9.2 Advanced settings

⚠️ Only adapt advanced settings in consultation with your dealer!

Make a selection between the two advanced settings and enter the PIN ('0000'). Figure 17 shows a section of the program settings that can be adjusted.

Chapter	Name	Type	Value
Machine	Type	Integer	2
Machine	NumRows	Integer	4
Machine	RowDistance	Float	0.750000
Machine	TareWeighing	Integer	0
InputFilter	WheelSpeedRc	Float	0.300000
InputFilter	BeltSpeedRc	Float	0.300000
InputFilter	LoadCellRc	Float	0.300000
Log	Counter	Integer	210
Log	DelaySecs	Float	5.000000
Log	HoldSecs	Float	5.000000

Figure 17. Program settings

Double-click on a setting line to adjust its value.

10. Log file contents (advanced)

The system saves yield information in .csv files. These can be exported to a USB stick (section 8.2) and viewed via PC software such as Excel, ArcGIS, AgLeader SMS or FarmWorks. All data are saved in columns as comma separated values. A title row indicates which info is in which column. Depending on the type of harvester, fuel data of the machine are logged as well.

year	month	day	hr	min	sec	lon(degr)	lat(degr)	alt(m)	qual	sats	x(m)	y(m)	speed(km/h)	load(kg)	tare(kg)	conv.factor	belt
2012	10	2	9	1	47	5.01819	51.2251	19.24	4	13	-177.61	202.88	1.33	14.2	14.2	3.1575	
2012	10	2	9	1	50	5.01821	51.2251	19.247	4	13	-176.57	203.53	1.66	14.4	14.2	3.1575	
2012	10	2	9	1	52	5.01822	51.2251	19.253	4	13	-175.5	204.39	2.63	15.1	14.2	3.1575	
2012	10	2	9	1	54	5.01824	51.2251	19.247	4	14	-174.31	205.3	2.6	15.5	14.2	3.1575	
2012	10	2	9	1	56	5.01826	51.2251	19.229	4	14	-173.08	206.17	2.72	16	14.2	3.1575	
2012	10	2	9	1	58	5.01828	51.2251	19.245	4	15	-171.95	207.23	2.85	16.3	14.2	3.1575	
2012	10	2	9	2	0	5.0183	51.2251	19.258	4	14	-170.64	208.2	2.9	15.9	14.2	3.1575	
2012	10	2	9	2	2	5.01831	51.2251	19.253	4	14	-169.46	209.17	2.69	16.6	14.2	3.1575	
2012	10	2	9	2	4	5.01833	51.2251	19.235	4	14	-168.24	210.19	2.84	17	14.2	3.1575	
2012	10	2	9	2	6	5.01835	51.2251	19.233	4	14	-166.66	211.42	4.04	17.9	14.2	3.1575	
2012	10	2	9	2	7	5.01837	51.2251	19.232	4	15	-165.76	212.22	4.26	18.3	14.2	3.1575	
2012	10	2	9	2	8	5.01838	51.2251	19.237	4	15	-164.82	212.94	4.26	18.5	14.2	3.1575	
2012	10	2	9	2	9	5.01839	51.2252	19.246	4	15	-163.93	213.7	4.19	18.3	14.2	3.1575	
2012	10	2	9	2	10	5.01841	51.2252	19.248	4	15	-162.95	214.38	4.32	18.6	14.2	3.1575	
2012	10	2	9	2	11	5.01842	51.2252	19.261	4	15	-162.02	215.12	4.21	17.6	14.2	3.1575	
2012	10	2	9	2	12	5.01843	51.2252	19.26	4	15	-161.11	215.88	4.28	17.3	14.2	3.1575	
2012	10	2	9	2	13	5.01845	51.2252	19.264	4	15	-160.17	216.61	4.21	18.4	14.2	3.1575	
2012	10	2	9	2	14	5.01846	51.2252	19.269	4	16	-159.29	217.42	4.27	18.9	14.2	3.1575	
2012	10	2	9	2	15	5.01847	51.2252	19.268	4	16	-158.33	218.13	4.26	17.9	14.2	3.1575	
2012	10	2	9	2	16	5.01849	51.2252	19.263	4	16	-157.35	218.81	4.23	17.7	14.2	3.1575	
2012	10	2	9	2	17	5.0185	51.2252	19.254	4	17	-156.44	219.59	4.19	17.5	14.2	3.1575	
2012	10	2	9	2	18	5.01851	51.2252	19.256	4	17	-155.52	220.34	4.23	18.5	14.2	3.1575	
2012	10	2	9	2	19	5.01853	51.2252	19.233	4	17	-154.56	221.05	4.28	18.2	14.2	3.1575	
2012	10	2	9	2	20	5.01854	51.2252	19.218	4	16	-153.62	221.8	4.28	18.1	14.2	3.1575	
2012	10	2	9	2	21	5.01855	51.2252	19.21	4	16	-152.67	222.54	4.3	17.5	14.2	3.1575	
2012	10	2	9	2	22	5.01857	51.2252	19.217	4	17	-151.74	223.3	4.28	17.3	14.2	3.1575	
2012	10	2	9	2	23	5.01858	51.2252	19.211	4	17	-150.87	224.07	4.22	16.8	14.2	3.1575	
2012	10	2	9	2	24	5.01859	51.2253	19.207	4	17	-149.95	224.79	4.22	17.3	14.2	3.1575	
2012	10	2	9	2	25	5.0186	51.2253	19.193	4	16	-149.07	225.54	4.18	17	14.2	3.1575	
2012	10	2	9	2	26	5.01862	51.2253	19.196	4	16	-148.16	226.24	4.12	17	14.2	3.1575	
2012	10	2	9	2	27	5.01863	51.2253	19.191	4	16	-147.23	226.92	4.14	17.5	14.2	3.1575	
2012	10	2	9	2	28	5.01864	51.2253	19.196	4	16	-146.38	227.68	4.04	17.4	14.2	3.1575	
2012	10	2	9	2	29	5.01866	51.2253	19.181	4	15	-145.47	228.38	4.13	17.4	14.2	3.1575	
2012	10	2	9	2	30	5.01867	51.2253	19.18	4	15	-144.58	229.06	4.08	17.4	14.2	3.1575	
2012	10	2	9	2	31	5.01868	51.2253	19.171	4	15	-143.72	229.76	3.92	17.4	14.2	3.1575	
2012	10	2	9	2	32	5.01869	51.2253	19.171	4	15	-142.79	230.39	3.98	17.6	14.2	3.1575	
2012	10	2	9	2	33	5.01871	51.2253	19.174	4	15	-141.89	231.09	4.04	17.4	14.2	3.1575	
2012	10	2	9	2	34	5.01872	51.2253	19.188	4	15	-141.05	231.85	4.04	17.8	14.2	3.1575	
2012	10	2	9	2	35	5.01873	51.2253	19.202	4	16	-140.13	232.52	4.12	17.3	14.2	3.1575	
2012	10	2	9	2	36	5.01874	51.2253	19.207	4	16	-139.26	233.25	4.12	16.6	14.2	3.1575	
2012	10	2	9	2	37	5.01876	51.2253	19.214	4	16	-138.46	234.07	4.09	16.3	14.2	3.1575	
2012	10	2	9	2	38	5.01877	51.2253	19.194	4	17	-137.55	234.73	4.06	16.3	14.2	3.1575	

Figure 18. Yield data in Excel

The columns are explained below.

year, month, day, hr, min and sec : day and time
lon(degr) : geographical longitude in decimal degrees
lat(degr) : geographical latitude in decimal degrees
alt(m) : geographical height in metres
qual : GPS quality (0=no gps, 1= gps, 2= dgps, 4= rtk-fix, 5= rtk-float)
sats : the number of GPS satellites used
x(m) : x coordinates relative to the starting point in metres
y(m) : y coordinates relative to the starting point in metres
speed(km/h) : speed in kilometres per hour
load(kg) : weight measured by the load cells, including the weight of the belt
tare(kg) : the total weight of the belt, minus the weight of the belt itself

conv.factor : the current scale factor
beltspd(m/s) : the speed of the belt in metres per second
workwidth(m) : the work width in metres
yield(ton/ha) : the yield in tonnes per hectare
totalyield(ton) : the total yield of the field in tonnes
totalarea(ha) : the total area of the field in hectare
worktime(s) : the total work time of the field in seconds
loadnr : load number
loadweight(ton) : the total weight of the load in tonnes
loadbelt(m) : internal data used for calibration – do not use this
enginespd(rpm) : the motor speed in revolutions per minute
demandtorque(%) : the demanded torque percentage
actualtorque(%) : the actual torque percentage
fuelrate(l/h) : the fuel consumption in litres per hour
totfuel(l) : the total fuel consumption since the start of the operation in litres
tractrear(bar) : the pressure on the hydraulics on the rear traction

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