



Software e-drive II e-drive fert

Operating manual Original operating manual

Edition	11.2021
Printing	11.2021
Language	EN
e-drive II, e-drive fert, as of version	e-drive II 1.9.0.3 e-drive fert 1.07xx
For	Precision seeding machines
Reference number	AC758037


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Identification of the machine

Operating manual valid
from machine number

In order for your dealer to assist you as fast as possible, you will need to provide some information about your machine. Please enter the details here.

Designation

Software e-drive II e-drive fert

Working width

Weight

Machine number

Accessories

Supplier's address

Manufacturer's address

Kverneland Group Soest GmbH
Coesterweg 42
D-59494 Soest
Germany

Tel. +49 (0) 2921/974-0

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Preliminary information

Target group

This operating manual is intended for trained farmers and individuals who are otherwise qualified to perform agricultural activities and who have received instruction in the operation of this machine.

Safety

Study the contents of this operating manual carefully, which are relevant for your activity, before initial operation or assembly of the machine.

This operating manual describes software which is intended for the operation of a certain seeding machine model. This operating manual therefore only applies in conjunction with the operating manual of the associated machine.

Always read through the safety instructions in the “Safety” chapter of the machine's operating manual and observe the warning information in the individual chapters of this operating manual as well as the machine's operating manual. You will obtain optimal operating results and will also be working more safely.

For the employer

Provide instruction in these safety instructions for personnel working with the machine on a regular basis and provide information on statutory regulations. Untrained or unauthorised persons must not be allowed to use the machine.

The following are included in this training:

- Checking that staff possess the necessary requirements for safely handling the machine
- Handing out the operating manual and the other relevant and applicable documents or an intensive course of training which, in particular, includes the safe handling of the machine

Regular instruction sessions

Instruct your staff regularly, but at least once year, concerning the basic procedural measures for safely handling the machine.

Instruction

You will receive training from your dealer concerning using the controls, safe operation and care of the machine. Initial operation without first receiving training is not permitted.

Other applicable documents

In addition to the operating manual, other documents also form an integral part of the machine:

Operating manual of the seeding machine	Integral part of the delivery of the seeding machine
Operating manual for the terminal	For example, IsoMatch Tellus
“GEOCONTROL” operating manual	Integral part of the delivery of the software

Symbols

In order to make this manual clear and easy to read, we have used various symbols. They are explained below:

- A bullet point stands next to enumerations
- ▶ A triangle is located before activities which you should undertake
- An arrow indicates cross-references to other text passages

[+] A plus sign indicates an accessory that is not included in the standard version.

Pictograms

We also use pictograms which will help you in finding text passages:



The warning triangle indicates warning information. Failure to observe these safety instructions can result in:

- Moderate to serious injury
- Fatal injury

You will find the warning information associated with individual operations, where it is important to observe the warning information before these operations are carried out.



This sign indicates important instructions regarding the machine. Failure to observe these safety instructions can result in:

- Serious faults in the correct operation of the machine
- Damage to the machine



This symbol indicates information, tips and notes on operation.



This symbol indicates tips for assembling or setting up work.



This symbol indicates examples that assist a better understanding of the instructions.

Parts in the text which refer to individual machines or to conditions have a coloured background. After the coloured section, the text then again applies to all conditions and machines. For example:

Before folding out only

- ▶ Release the locking mechanism for transport+

- ▶ Actuate the control unit



When working on the machine, disconnect the terminal from the machine

During all work on the machine, disconnect the terminal from the machine in order to exclude the possibility of unintended commands being sent.

Unintended commands sent from the software to the machine may trigger unpredictable movements on the machine which could cause personal injury or death.

The system is ready to operate after being connected up and can be switched on.

- ▶ Switch on the terminal
- Operating manual for the terminal

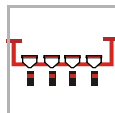
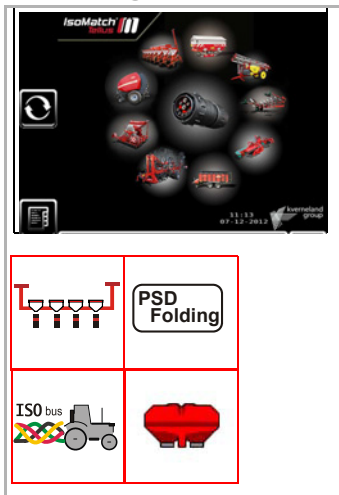
The system performs a short self-test. You will then see the information screen.



Apart from the opening screen and the information screen there is also an ECU screen available. The inputs are described in a separate operating manual.

- "IsoMatch Tellus" operating manual

Opening screen



To the software "e-drive II"

- Chapter »"e-drive II" software«, page 7



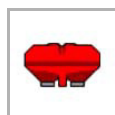
To the software "Folding"

- Chapter »Software "Folding"«, page 42



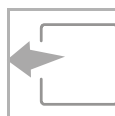
To the ECU screen

- Operating manual for "IsoMatch Tellus" or another ISOBUS-compatible screen



To the "e-drive fert" software

- Chapter »"e-drive fert" software«, page 62



Back to the last function

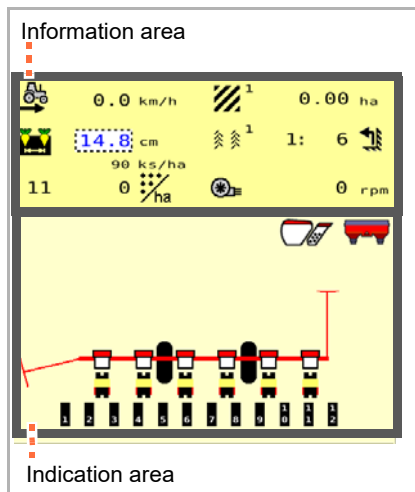
- ▶ Press the symbol



Back to the opening screen

- ▶ Press the symbol

Information screen



The information screen displays all of the most important values during seeding work.

Information area

You can read off all of the current values during seeding work in the information area.

Indication area

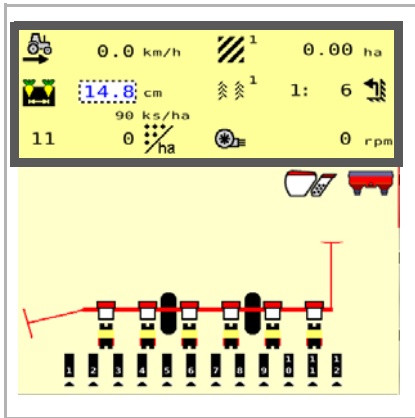
The indication area is used to display the current status of the machine and the sowing unit through the use of symbols.

The meaning of the symbols will be described on the next pages. You can also go directly into the menu “Basic settings” and check and alter entries there.

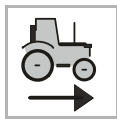
→ Chapter »“e-drive II” software«, section »Basic settings«, page 23

“e-drive II” software

Information area



Symbols



Speed in km/hour



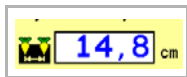
Cultivated area, in ha

The figure indicates the number of the active task from the “Task” menu.



Sowing distance in the row [cm]

You can change the sowing distance in the row in the information screen.



- ▶ Click on the input field.
A keyboard for inputting values appears.
- ▶ Input value as desired.
- ▶ Confirm value.



The number of seeds in 1000s per ha [ks/ha] is calculated automatically and shown on the information screen.



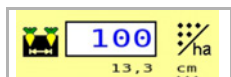
Display of the quantity of seed applied in the row

To change the input to “Sowing distance in the row [ha]”:

→ Chapter »“e-drive II” software«, section »Basic settings«, page 23



Example:



Desired quantity of seeds per hectare:	100.000
Display:	100



The sowing distance is calculated automatically. An input is not necessary.



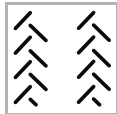
You can set the sowing distance for individual sowing units in a separate menu. When this setting type is used, the sowing distance cannot be changed on the information screen.

→ Chapter »“e-drive II” software«, section »Sowing distance in the row«, page 19



Display when setting the sowing distance for individual sowing units
The average spacing in the row is displayed. It is only possible to change the values for individual sowing units in the menu for the sowing distance.

→ Chapter »“e-drive II” software«, section »Sowing distance in the row«, page 19



Information about the tramlines

Only visible if tramlines are activated. Two different tramlines can also be displayed if two tramline rhythms were set.

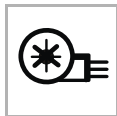


Example:

1 : 4

1 = Current pass

4 = Total number of passes

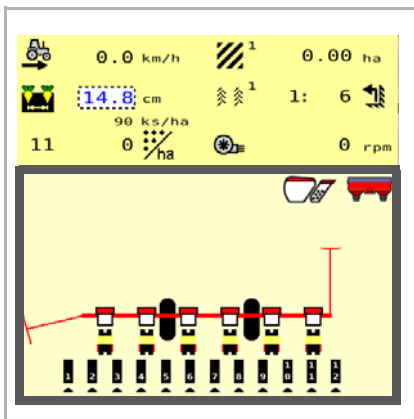


Display of fan speed

Only for machines with fan monitoring. If the entered fan speed differs by 10 % above or below, an alarm sounds.

“e-drive II” software

Indication area



Symbols



The machine works with micro-drill



The machine works with a fertiliser spreader

Each sowing unit is indicated by a symbol and a number.



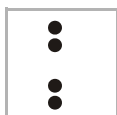
Sowing unit without a fault. The number indicates the sowing unit number.



Sowing unit is switched off



Tramline is set up



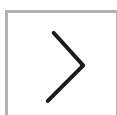
Seed hopper is almost empty



Seed hopper is empty or “0” was entered for the sowing distance for this sowing unit



Opto-sensor deactivated



Speed of drive motor too high



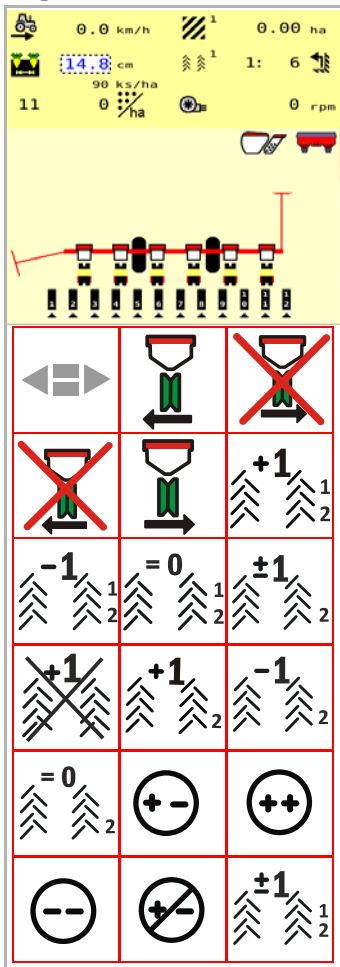
Speed of drive motor too low



Drive motor for the sowing unit blocked

Keys

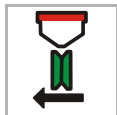
Page 1



- Increase application rate
- Decrease application rate
- Switch off individual sowing units
- Switch on individual sowing units
- Change tramline rhythms



Scroll to the next or previous page



Switch on individual sowing units from the right



Switch off individual sowing units from the left



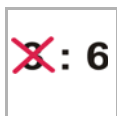
Switch off individual sowing units from the right



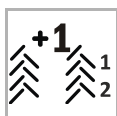
Switch on individual sowing units from the left



Activate or deactivate the tramline control system
If the tramline control system is deactivated, the current pass is continued.



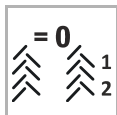
When the tramline control system is deactivated, the symbol for activating or deactivating the tramline control system flashes and a red cross appears in the information area.



Current pass +1 for both tramline rhythms



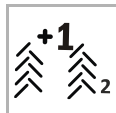
Current pass -1 for both tramline rhythms



Set current pass for both rhythms to first pass. Both rhythms begin afresh.



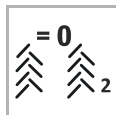
Change how the keys are assigned in order to configure the individual tramline rhythm settings.



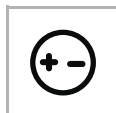
Current pass +1 for the second tramline rhythm



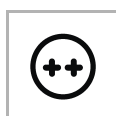
Current pass -1 for the second tramline rhythm



Set current pass for the second rhythm to first pass. The rhythm starts afresh.



Change how the keys are assigned in order to configure the application rate settings



Increase application rate by a defined percentage



Decrease application rate by a defined percentage

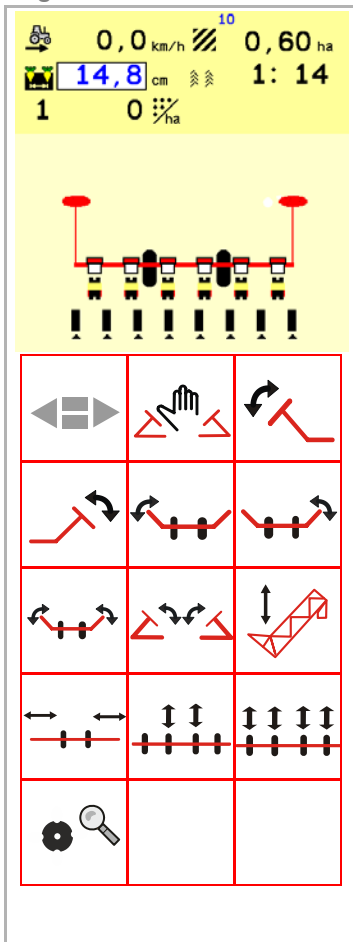


Reset the application rate to the normal value



Change how the keys are assigned in order to configure both tramline rhythms

Page 2

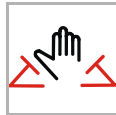


To fold the track marker the machine must be folded out and must be in work position.

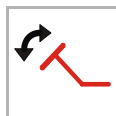
- Folding the track markers
- Lift or lower the side of the machine
- Move the machine into the transport position or the work position



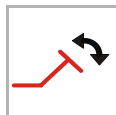
Scroll to the next or previous page



Switch off the automatic changing of the track marker. Only the current track marker is active. The second track marker remains folded in. For information purposes, the flashing symbol appears in the information area.



Fold out the track marker on the left side



Fold out the track marker on the right side

- ▶ To perform seeding work, preselect the track marker which has to be opened out first. The symbol flashes.
- ▶ Actuate the control unit on the tractor. The track marker is folded out.

The flashing symbol indicates that the control valve is active. Lift out the machine at the end of the field and actuate the control unit for the track markers. Lifting out the machine will cause the second track marker to be pre-selected automatically.

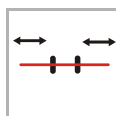


For machines with a 9.00 m PH frame, a separate menu controls the folding process.

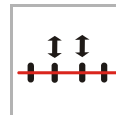
→ Chapter »Information menu«, section »Machines with a 9.00 m PH frame«, page 42

Machines with a moveable frame

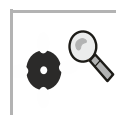
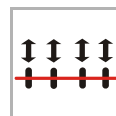
Retract or extend the frame



For TF Profi only: Retract or extend the middle chassis



For TF Profi only: Retract or extend all the chassis



For SX sowing units only: Set the scraper

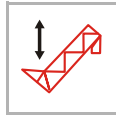
→ Chapter »“e-drive II” software«, section »Scraper settings«, page 20



Only lower the filling auger when the machine is extended

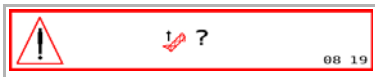
Before lowering the filling auger, check that the machine is extended.

If the filling auger is lowered when the machine is retracted, the sowing units may be damaged.



Lifting or lowering the filling auger

Only use this function when the machine is extended



For TF Profi only: Prompt before extending the chassis.



Only extend the chassis when the filling auger is lifted

Before extending the chassis, check whether the filling auger is lifted.

Failure to observe this instruction can result in damage to the machine.



The filling auger is lifted:

- ▶ Confirm extension



The filling auger is not yet lifted:

- ▶ Reject extension
- ▶ Lifting the filling auger

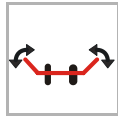
Machines with a foldable frame



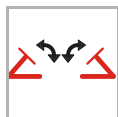
Lift or lower the left side of the machine



Lift or lower the right side of the machine

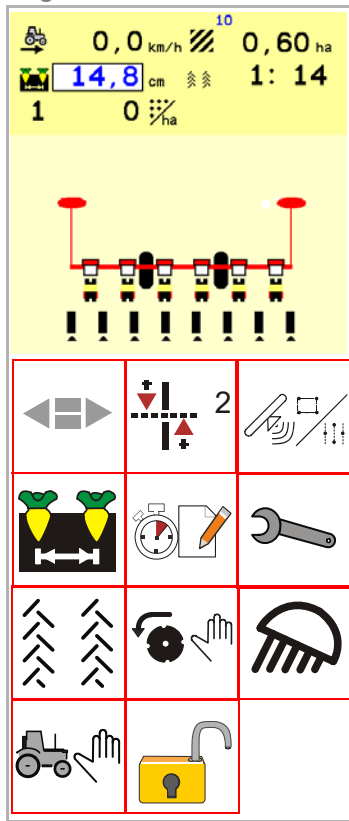


Move the machine into the transport position or the work position
→ Chapter »“e-drive II” software«, section »Transport or work position«, page 18

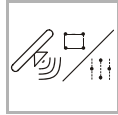


Move the machine into the transport position or the work position

Page 3



- Set the sowing distance in the row. This value applies for all seed rows. Should the individual seed rows have different values, enter the sowing distance in the row for each individual seed row.
- Input the GEOSEED data
- Select task processing
- Make basic settings
- Set tramline
- Start manual filling of the cells

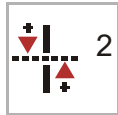


GEOSEED

A display is shown if GEOSEED Level or GEOSEED Level II has been activated.

→ Chapter »GEOSEED«, page 49

- The symbol is green if GEOSEED Level II is working in conjunction with RTK.
- The symbol is red if the basic conditions for GEOSEED Level II are not satisfied.



GEOSEED correction

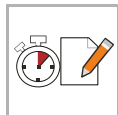
→ Chapter »GEOSEED«, page 49

A display is only shown if GEOSEED Level II has been activated.



Set the sowing distance in the row for each individual sowing unit. An average value is then calculated, which is displayed in the information screen. The values for the individual seed rows are not displayed in the information screen.

→ Chapter »“e-drive II” software«, section »Sowing distance in the row«, page 19

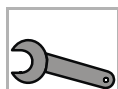


Task processing

→ Chapter »“e-drive II” software«, section »Task processing«, page 22

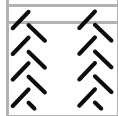


The symbol is not visible if task management has been activated via TaskControl.



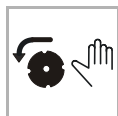
Basic settings

→ Chapter »“e-drive II” software«, section »Basic settings«, page 23



Tramlines

→ Chapter »“e-drive II” software«, section »Tramlines«, page 37



Manual filling of the cells

→ Chapter »“e-drive II” software«, section »Manual filling of the cells«, page 41



Switching the work light on the machine on or off

- ▶ Press the symbol

A display is only shown if the work light has been activated.

→ Chapter »“e-drive II” software«, section »Page 4«, page 31



Manual starting of the drive motors

→ Chapter »“e-drive II” software«, section »Manual starting of the drive motors«, page 41

Alarm at speed “0”

An alarm will sound if you stop the machine for more than 30 seconds when sowing. The electric drive for the sowing units and on the fertiliser metering devices is blocked.

To activate the alarm:

→ Chapter »“e-drive II” software«, section »Basic settings«, page 31



Unexpected start-up of electric motors

Only release the electric motors when no persons are, or are to be, in the vicinity of the machine. When released, the electric motors may start up unexpectedly, for example, if the radar sensor is activated by moving objects, persons or animals.

Persons remaining on the machine may be injured by driven machine components.



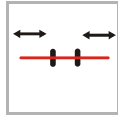
Release electric motors

- ▶ Before driving off, release the electric motors once again

Transport or work position

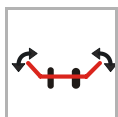
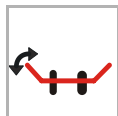
The machine can be folded in/out from the:

- Transport position into the work position
- Work position into the transport position



Machines with a moveable frame:

- ▶ Press the key. The symbol flashes.
- ▶ Actuate the control unit on the tractor and the frame will be retracted or extended
- ▶ Press the key again. The symbol stops flashing.



For machines with a foldable frame:

- ▶ Press the key for the left- or right-hand side. The symbol flashes.
- ▶ Actuate the control unit on the tractor and the frame on the selected side will be folded in or out
- ▶ Press the key again. The symbol stops flashing.

- ▶ Press the key. The symbol flashes.
- ▶ Actuate the control unit on the tractor and the frame will be folded in or out
- ▶ Press the key again. The symbol stops flashing.

For machines with a 9.00 m PH frame:

Machines with a 9.00 m PH frame are folded in or out using their own software.

→ Chapter »Software “Folding”«, section »Machines with a 9.00 m PH frame«, page 42

Sowing distance in the row



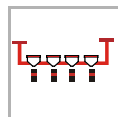
You can determine the sowing distance in the row here for each individual sowing unit. The spacing is specified in centimetres.

10 %			cm ++ 2 %		
01	14,8	02	14,8	03	14,8
04	14,8	05	13,8	06	14,8
07	13,8	08	14,8		

Percentage step for the increased amount in the neighbouring rows of a tramline

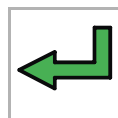
Percentage step for the increased amount or decreased amount of individual neighbouring rows

Sowing distance input for each sowing unit. Inputting “0” will turn off the sowing unit. In this way, you can create tramlines manually.



To the information screen

→ Chapter »“e-drive II” software«, section »Information screen«, page 6



Save inputs

If the input is saved, the information appears in grey in the input fields. The input fields are locked to new input. To unlock these, press the C key.



The input fields are unlocked again. New information can be input.

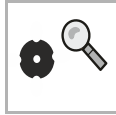


To return the rows to a consistent value for the sowing distance, you will need to input a new value for the sowing distance in the information screen. The sowing distance is then set uniformly for all rows.

→ Chapter »“e-drive II” software«, section »Information screen«, page 6

“e-drive II” software

Scraper settings



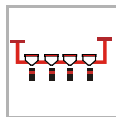
For Optima SX sowing units, use the software to test the settings for the scraper.

- Raise the machine before the test
- Switch on the fan

Enter the number of the unit.

Enter the driving speed.

START STOP



To the information screen
→ Chapter »“e-drive II” software«, section »Information screen«, page 6



Start testing the scraper.



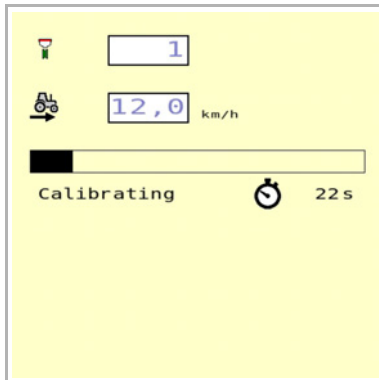
Stop testing the scraper.



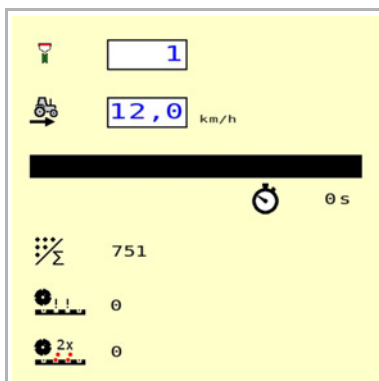
Before you start testing the scraper in the software, you must set the working pressure on the relevant sowing unit and place a catch pan below the sowing unit.

Filling

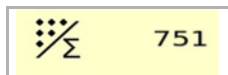
The cell wheel fills after starting the test.



Testing in progress.



Testing complete. Results displayed.



Number of grains discharged



Number of spaces



Number of doubles



If there are spaces or doubles, check the pressure setting for the scraper on the sowing unit and make it higher or lower.
 → Operating manual of the seeding machine
 Failure to observe these instructions may result in poor work results.

Repeat the testing process every time the pressure setting for the scrapers is changed.

“e-drive II” software

Task processing



Twenty different tasks can be stored at once. For each task, the following information is recorded from the start of the task:



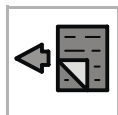
The task is only completed if a new task has been selected.

1	2	3	4	5	6
feld 1					
↔	24 - 10 - 2017	13 : 09			
⌚	2 : 18	h : m	Period of time the machine was in operation		
⌚	13 : 52	h : m	Period of time the machine was not in operation		
🌱	2,78	ha	Cultivated area, in ha		
🚛	20,314	km	Kilometres driven		
🌾	359,7	s (x1000)	Total grain application rate [s] x 1000		
🌾/m²	12,94	s/m²	Grain application rate per m² [s/m²]		



Deleting tasks:

Before permanently deleting a task, you will be prompted to confirm whether you are sure you want to delete the task.



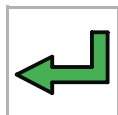
To the previous task



To the next task

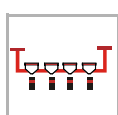


Delete data



Start the task

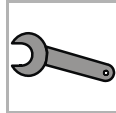
To the information screen. The active task is shown as a number in the information screen.



To the information screen

→ Chapter »“e-drive II” software«, section »Information screen«, page 7

Basic settings



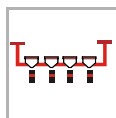
Basic settings refer to machine data which is important for controlling functions or triggering alarms. Basic settings are spread over a number of pages.

Page 1

	<input type="text" value="1"/>	Percentage step for increased or decreased amounts
	<input type="text" value="0.0"/> <input type="text" value="16.0"/>	Maximum speed (alarm at a lower speed)
	<input type="text" value="16.0"/>	Maximum speed (alarm at a higher speed)
	<input type="text" value="1"/>	Number of sowing units which should be switched off for partial width switching off
	<input type="text" value="1"/>	Sensitivity of the opto-sensor
	<input type="text" value="cm"/>	Sowing distance in the row or quantity of seeds x 1000
	<input type="text" value="1"/>	Only on Optima HD sowing units: Sensitivity of the Plantirium sensors

					PEM
--	--	--	--	--	------------

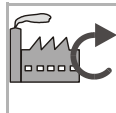
Keys



To the information screen
→ Chapter »“e-drive II” software«, section »Information screen«, page 7



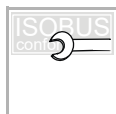
To the next page



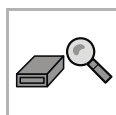
Restore factory settings
All inputs are reset to the stored factory setting.



Settings for the pre-emergence marker
→ Chapter »“e-drive II” software«, section »Pre-emergence marker«, page 33

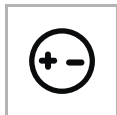


Screen and GEOCONTROL settings
→ Chapter »GEOCONTROL«, page 57



To the information menu
→ Chapter »“e-drive II” software«, section »Information and testing«, page 34

Symbols



Enter the desired percentage steps for the increased and decreased amounts during seeding. The amount of seed is increased or decreased by this percentage in the information screen using the appropriate keys.

→ Chapter »“e-drive II” software«, section »Indication area«, page 10

Right data entry window



Use the right-hand data entry window to enter the maximum speed. An alarm will sound if this speed is exceeded. The maximum speed at which perfect placing of the seed is still possible depends on the machine and the soil conditions. It is therefore important to verify placing of the seed on the field.

Checking the placement

To do this, stop travelling and complete the check as below before continuing travel:

- ▶ Lift the machine
- ▶ Reverse approximately 50 cm



The individual seeds will be deposited with a short delay. If you do not travel in reverse, an area will not be sown.

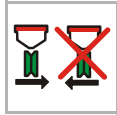
- ▶ Check the fan
- ▶ Lower the machine
- ▶ Accelerate slowly when driving off afterwards

Left data entry window

Use the left-hand data entry window to enter the minimum speed. An alarm will sound if the actual speed is less than this figure. You can select the minimum speed. You must, however, maintain the minimum value for your machine.

Minimum values	
Monopill	4.0 km/hour
Unicorn	1.0 km/h
Optima	1.0 km/h

Switching off individual sowing units



It may be necessary to switch off individual sowing units if the field shape is unfavourable. Enter the number of sowing units which can be switched off simultaneously.

Opto-sensor sensitivity



In difficult conditions, such as dust or wetness, the opto-sensor can frequently trigger false alarms. It can then be useful to reduce the sensitivity.



Normal sensitivity



Reduced sensitivity



Greatly reduced sensitivity for fine seed

You can select how you would like specify the amount of seed:



Sowing distance in the row [cm]

The number of seeds per ha is calculated automatically and shown in the input field on the information screen.



Number of seeds x 1000 per ha

The sowing distance is calculated automatically and shown in the input field on the information screen.



When you enter "Number of seeds x 1000 per ha", the values are adjusted to the row spacing.

Example:

You would like to enter 100,000 seeds per ha. From that data, the software calculates the sowing distance. The sowing distance can be calculated to exactly 1 mm. Intermediate values are automatically rounded by the software and taken into account for the display “Number 1000 seeds per ha”.

For Optima HD sowing units

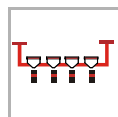
Setting the seed for Plantirium sensors



- Fine seed – rape, onion
- Small seed – sugar beets, chicory, sorghum
- Large seed – maize, broad beans, soybeans, pumpkins, sunflowers

Select the sensor for the driving speed
 Select sensor for starting or stopping the electric motors on the sowing units
 Select the sensor for tramline advancing
 Activate to send the driving speed to the fertiliser spreader
 / 100 m Number of pulses from the travel sensor
 < < Start calibration
 < Target fan speed

Keys



To the information screen
→ Chapter »“e-drive II” software«, section »Information screen«, page 7



To the previous page

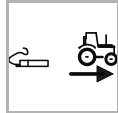


To the next page

Symbols

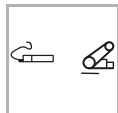
Activating or deactivating:

Activate	=	Tick in box
Deactivate	=	No tick in box



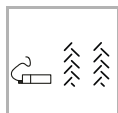
Selecting the sensor for the driving speed:

1. Wheel	Wheel sensor on machine
2. Manual	No sensor Speed is manually entered and driven with the tractor
3. ISO 11783 Radar	Radar sensor on the tractor Prerequisite: The tractor supports ISOBUS
4. ISO 11783 Wheel	Wheel sensor on tractor Prerequisite: The tractor supports ISOBUS
5. COMBI	Transfer the speed via ISOBUS, e.g. fertiliser hopper in combination with Optima
6. RADAR	Radar sensor on the machine



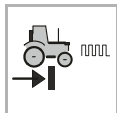
Selecting the sensor for starting or stopping the electric motors on the sowing units:

1. Work switch	Lifting the machine
2. ISO 11783 work switch	Lifting the tractor's lower link balls If you have chosen this setting, choose also “ISO 11783 work switch” for the sensor for advancing the tramlines.



Selecting the sensor for tramline advancing:

1. Work switch + markers	Lifting the machine and changing the active track marker arm. This is the factory setting.
2. Work switch	Lifting the machine. The tramline is advanced by a delay of three seconds. This is how undesired advancing of the tramline on uneven ground will be avoided. When creating a tramline, you will hear a signal sound.
3. ISO 11783 work switch	Lifting the tractor's lower link balls Prerequisite: The tractor supports ISOBUS.



Number of pulses from the travel sensor or radar sensor over 100 metres. The pre-set value is dependent on the machine type:

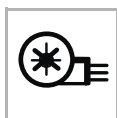
Machine	Pre-set value (guide value)
Travel sensor	
Optima	4800
Monopill	3880
Unicorn	3880
Radar sensor	
All machines	19500

Recommendation: You can determine this value through calibration. This procedure is more accurate and is adapted to the current soil conditions:

- ▶ Exactly measure off 100 metres on the field
- ▶ Move the machine to its work position
- ▶ Activate “Start”
- ▶ Drive 100 m
- ▶ Activate “Stop”

The number of pulses will be indicated.






- ▶ Confirm the value with “OK”

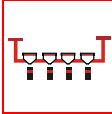
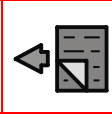

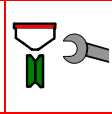


Only for machines with fan monitoring. Enter the fan speed. If the entered fan speed differs by 10 % above or below, an alarm sounds.

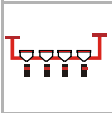


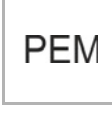
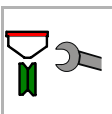


For precision seeding machines, the fan speed is dependent on the vacuum required on the sowing units. The vacuum can be read on the manometer. An entry for monitoring the fan speed is therefore only of limited use.

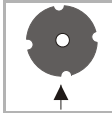

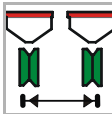
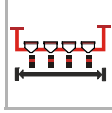
	<input type="text" value="32"/>	x	Number of holes in the seed disc
	<input type="text" value="8"/>	x	Number of sowing units
	<input type="text" value="8"/>	x	Number of active sowing units
	<input type="text" value="75,0"/>	cm	Distance between sowing units (10 to 250 cm)
	<input type="text" value="6,000"/>	m	Current working width of the seeding machine

			PEM	
---	---	---	-----	---

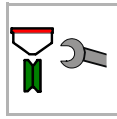
Keys

-  To the information screen
→ Chapter »“e-drive II” software«, section »Information screen«, page 7
-  To the previous page
-  To the next page
-  Settings for the pre-emergence marker
→ Chapter »“e-drive II” software«, section »Pre-emergence marker«, page 33
-  Sowing unit configuration
→ »“e-drive II” software«, section »Sowing unit configuration«, p. 30

Symbols

-  Enter here the number of holes in the seed disc. The number is written on the seed disc.
-  Number of sowing units on your seed sowing machine
-  Distance between sowing units [cm]
Input: At least 10 cm up to maximum 250 cm
-  Current working width [m]

Sowing unit configuration



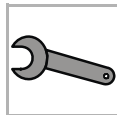
You can apply the following settings for the sowing units on the sowing unit configuration page:

- Switch the sowing units on and off
- Activate or deactivate the opto-sensors for the individual sowing units
- Activate or deactivate the sensor for synchronising the individual sowing units
- Deactivate or reactivate every second sowing unit

Numbers of the sowing units	Activate or deactivate the sowing unit	Activate or deactivate the opto-sensors of the individual sowing units	Activate or deactivate the sensor for synchronising the individual sowing units	Sowing unit currently activated
8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	8
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1
2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	2
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3
4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	4
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	5
6	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	6

--	--	--	--

Keys



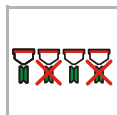
To the basic settings
→ Chapter »“e-drive II” software«, section »Basic settings«, page 23



To the previous page



To the next page



Automatic switch-off of even-numbered sowing units. The distance between the active sowing units is adjusted automatically.

Symbols

Activating or deactivating:

Activate	=	Tick in box
Deactivate	=	No tick in box

	<input checked="" type="checkbox"/>		<input type="text" value="5"/>	<p>Activate the fan speed sensor</p> <p>Delay time in seconds for the fan speed alarm when speed is too high or too low. An input for monitoring a front hopper may be useful.</p>
	<input type="checkbox"/>		<input type="checkbox"/>	<p>Activate the left- and right-hand sensors on the metering device. Only in conjunction with a mechanical fertiliser spreader</p>
	<input checked="" type="checkbox"/>			<p>Activate the sensor in the fertiliser hopper</p>
	<input checked="" type="checkbox"/>			<p>Activate if work light present</p>
	<input checked="" type="checkbox"/>			<p>Activate if work light present</p>
	<input type="checkbox"/>			<p>Select parallel formation pattern or diamond formation pattern</p>
	<input type="checkbox"/>			<p>Activate or deactivate GEOSEED Level 1</p>
	<input type="checkbox"/>			<p>Activate or deactivate the alarm at speed “0”</p>

Keys

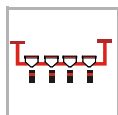


To the previous page



To the next page

A PIN code for the service technician is required on the next pages. Subsequent pages show special information about individual sowing units, motors and sensors. This information is intended for the service technician.



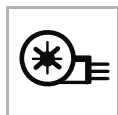
To the information screen

→ Chapter »“e-drive II” software«, section »Information screen«, page 7

Symbols

Activating or deactivating:

Activate	=	Tick in box
Deactivate	=	No tick in box



Fan speed sensor

When the sensor is activated, an alarm sounds if the fan speed exceeds or falls short of the specified value by 15%.

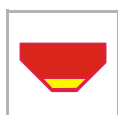


Only activate the sensors on the metering device in conjunction with a mechanical fertiliser spreader.



Metering device sensor

When the sensors are activated, an alarm sounds if the metering device does not turn even though the machine is running.



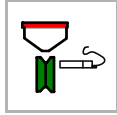
Sensor in the fertiliser hopper

When the sensor is activated, an alarm sounds if the sensor is no longer covered by fertiliser.



Activate or deactivate the work light

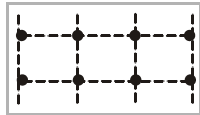
If there is a work light on the machine, you can activate it here and then switch it on or off via the terminal.



Activate or deactivate GEOSEED

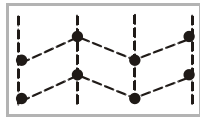
When GEOSEED is activated, the sowing units are set so that the grain is deposited according to a preselected pattern.

→ Chapter »GEOSEED«, page 49



Parallel formation pattern with GEOSEED

The seed is placed in a pattern comprising longitudinal and transverse rows. Typical use: mechanical chopping even transversely.



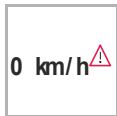
Diamond formation pattern with GEOSEED

The seed is placed so that each plant is positioned between two plants in the neighbouring seed row. Typical use: To ensure that plants receive equal amounts of sunshine.



If you use GEOSEED, the percentage increase in the increased amount in the neighbouring rows in a tramline should be set to “0”.

→ Chapter »“e-drive II” software«, section »Tramlines«, page 37



Activate or deactivate the alarm

When the alarm is activated, an alarm will sound if no pulses from the speed sensor are received with the machine in the work position.

Pre-emergence marker



On the sides for the pre-emergence markers you will find:

- The number of the distributor
- An allocation of the output on the distributor to the pre-emergence markers
- A possibility of raising or lowering the pre-emergence marker for test purposes

PEM		ID: 20076170	
0.01 2014-07-21			
ECU-PWR	11,5 V	CAN0-LOW	2,6 V
		CAN0-HIGH	2,5 V
OUT1	1	↑	↓
OUT2	2		
OUT3	3		
OUT4	4		
OUT5	5		
OUT6	6		
30 A max		Box: 1	

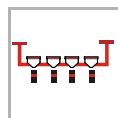
Voltage values in volts from CANBUS
 Raise or lower pre-emergence markers for test purposes
 Number of the output on the PCB in the distributor
 Number of the sowing unit that is allocated to the output. The sowing units are counted starting from the left in relation to the direction of travel.
 Number of the distributor. The number (how many) of distributors depends on the number (how many) of pre-emergence markers. Up to 6 pre-emergence markers can be connected per distributor.



To the previous page

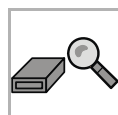


To the next page



To the information screen

→ Chapter »“e-drive II” software«, section »Information screen«, page 7

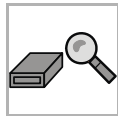


To information and testing

→ Chapter »“e-drive II” software«, section »Information and testing«, page 34

“e-drive II” software

Information and testing



The information pages contain:

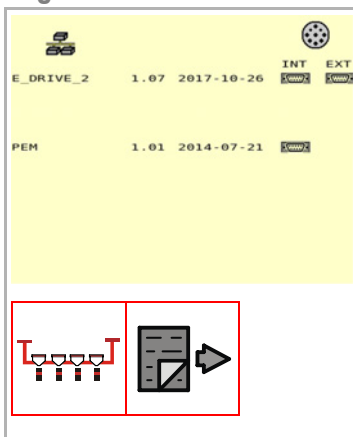
- The software version of the machine
- Performance data of the machine
- Information for the service technician

On the test pages you will find:

- Tests for various sensors (for the service technician)
- Tests for pre emergence marker and sowing unit drive motors

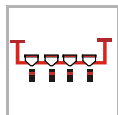
Information

Page 1



This screen shows the software version of the machine.

To the next page



To the information screen

→ Chapter »“e-drive II” software«, section »Information screen«, page 7

This screen shows performance data of the machine:

Σ ^h Total working time of the machine in hours [h]
 Σ ^{ha} Total output of the machine in hectare [ha]
 Σ ^{ha} Total output of the machine with GEOSEED Level 2 in hectares [ha]
 Σ ^{ha} Prerequisites for the display are a strong GPS signal and a driving speed within the permissible range.
 Σ ^{ha} Total output of the machine with GEOSEED in hectares [ha]
 Values are displayed here if the prerequisites mentioned above have not been fulfilled.
 PIN:

-PIN: This input is intended for the service technician

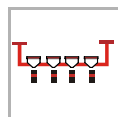


To the previous page



To the next page

Subsequent pages show special information about individual sowing units, motors and sensors. This information is intended for the service technician.



To the information screen

Chapter »“e-drive II” software«, section »Information screen«, page 7

“e-drive II” software

Checking

Page 1

This screen page is intended for the service technician. Here several sensors are checked and the voltage supply is displayed.

EDRIVE_NC_MAS		ID: 19464666	
0.02 2013-12-11			
ECU-PWR	12,5 V	ACT-PWR1	12,7 V
OUT-12V	12,6 V	ACT-PWR2	12,7 V
SENS-PWR1	12,6 V	ACT-5V	5,0 V
SENS-PWR2	12,6 V	ACT-GND	0,1 V
1V2	1,2 V	TEMP	27 C
CAN0-LOW	2,2 V	CAN1-LOW	1,9 V
CAN0-HIGH	2,9 V	CAN1-HIGH	3,1 V

Inputs	PU	Outputs	
MARKER L	<input checked="" type="checkbox"/>	MARKER L	<input type="checkbox"/>
MARKER R	<input checked="" type="checkbox"/>	MARKER R	<input type="checkbox"/>
WORKSWITCH L	<input checked="" type="checkbox"/>	FOLDING L	<input type="checkbox"/>
WORKSWITCH R	<input checked="" type="checkbox"/>	FOLDING R	<input type="checkbox"/>
WHEEL/RADAR	<input checked="" type="checkbox"/>	PEM L	<input type="checkbox"/>
DOSING	<input checked="" type="checkbox"/>	PEM R	<input type="checkbox"/>
LEVEL	<input checked="" type="checkbox"/>	LIGHTING	<input type="checkbox"/>
FAN	<input checked="" type="checkbox"/>	FOLD MARK	<input type="checkbox"/>
SPARE	<input checked="" type="checkbox"/>		

Current voltage

Sensors

Selection of the resistors. Do not make any changes here.

Activation of the track markers, left or right

Activation of the side section folding, left or right

Activation of the pre-emergence markers, left or right

Activation of the working lights

Activation of the track marker folding, left or right

Page 2

Here you can check the function of the pre-emergence markers and the sowing unit drive motors.

There are 3 drive motors allocated to each screen page.

E_DRIVE_2		ID: 29393	
1.07 2017 1-26			
OUT-12V	11,4 V	ACT-PWR1	12,8 V
5V-OUT	5,0 V	ACT-PWR2	12,7 V
4,0 km/h	<input type="text" value="1"/>	<input type="text" value="2"/>	<input type="text" value="3"/>
ENCODER	0	0	0
OPTO	2	2	2
SYNC	0	0	0
PEM UP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PEM DOWN	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MOTOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DISC RPM	38	0	0
SEED MISSED	0 %	0 %	0 %
SYNC MISSED	0 %	0 %	0 %
CURRENT	0,0 A	0,0 A	0,0 A

Current voltage on:
1 = ECU and microprocessor
2 = Drive motors

Speed for the motor test

Position of the sowing unit on the machine as seen from the rear. Starting from left.

Pre-emergence marker in transport position

Pre-emergence markers in the work position

Activate the sowing unit drive motor

Display of rotational speed for the seed disc

Display of shortage. A test without seed indicates 99 %.

Display of missing pulses for synchronising the sowing units. Normal: 0 – 10 %

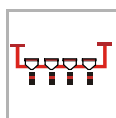
Display of drive motor power consumption



To the next page



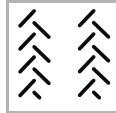
To the previous page



To the information screen

→ Chapter »“e-drive II” software«, section »Information screen«, page 7

Tramlines

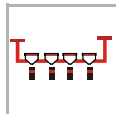


Tramlines are laid down for spraying/fertilising units such as field sprayers or fertiliser spreaders. It is possible to create two tramlines independently of one another, for example for a field sprayer and sprinkler system.

Page 1

Set up a tramline. Can only be activated if information has been entered on page 2.
 Set up a second tramline. Can only be activated if information has been entered on page 2.
 Start seeding work at the right or left side of the field
 % Increase the amount of seed in the rows next to the tramlines (data in percent)
 In combination with GEOSEED Level 2, the value is set to “0”. Inputs are then not possible.
 Can only be selected when using TaskControl. If selected, tramlines are visibly created and saved. If deselected, tramlines are created but are not visible and are not saved.

Keys



To the information screen
 → Chapter »“e-drive II” software«, section »Information screen«, page 7



To the next page

Symbols

Activating or deactivating:

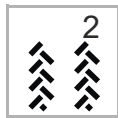
Activate	=	Tick in box
Deactivate	=	No tick in box



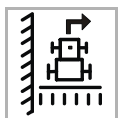
The fields for activating the tramlines are only unlocked after the information for the track width and working width of the spraying/fertilising unit has been entered on page 2.



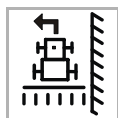
Set up a tramline



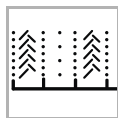
Setting up two tramlines



Beginning the seeding work at the left side of the field



Beginning the seeding work at the right side of the field



Setting up tramlines means that the plants in the rows next to the tramlines receive more nutrients and more light. They are larger on average than the plants in the normal rows. The amount of seed placed in the rows next to the tramlines can be increased to obtain an even range of plant sizes. The desired increase is entered as a percentage.

An increase during seeding work is achieved in the information screen.

→ Chapter »e-drive II” software«, section »Keys«, page 11



Function is only given when using TaskControl. If selected, tramlines are visibly created and saved. When sowing on the headland, the software switches on the sowing units so that the tramlines from previous passes at right angles to the headland are filled with seed.

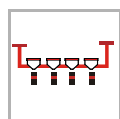


If deselected, tramlines are created but are not visible on the screen and are not saved. On the headland, the tramlines cannot be filled with seed in a targeted way.

Page 2

1		Set up one or two tracks in a tramline
	<input type="text" value="2,250"/> m	Track width of the spraying/fertilising tractor or spraying/fertilising unit [m]
	<input type="text" value="46,0"/> m	Working width of the spraying/fertilising unit [m]
	<input type="text" value="2"/>	Number of sowing units that are deactivated per mark when creating the tramlines
		Laying of the tramlines symmetrically or asymmetrically

Keys



To the information screen
→ Chapter »“e-drive II” software«, section »Information screen«, page 7

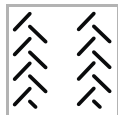


To the previous page



To the next page

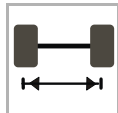
Symbols



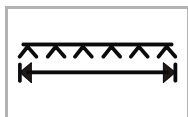
Set up two tracks in a tramline



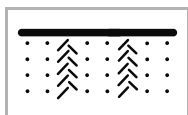
Set up just one track (right)



Track width of the care tractor or care device in metres.



Working width of the spraying/fertilising unit in metres
For example, field sprayers or fertiliser spreaders



Is only displayed if just one selection is possible

Setting up symmetrical tramlines

Both marks will be created during one pass.



Is only displayed if just one selection is possible

Setting up asymmetrical tramlines

Just one mark will be set up in one pass.

Manual filling of the cells



Before the seeding work on the field all cells should be filled with seed. This can be effected with the help of this key.



- Manual filling is only possible if the machine is stationary. While the machine is travelling, this function is deactivated.
- Before starting, the seed hoppers must be filled on the sowing units.
- While the cells are being filled, seed falls onto the soil. Place a suitable catch pan under the sowing units to collect the seed.
 - ▶ Switch on the fan
 - ▶ Press and hold the key until seed falls out of the coulter.

Manual starting of the drive motors



The drive motors on the sowing units can be started manually at a pre-set speed. You can use this procedure to set the separation of the seeds on the seed discs or to empty the sowing units.

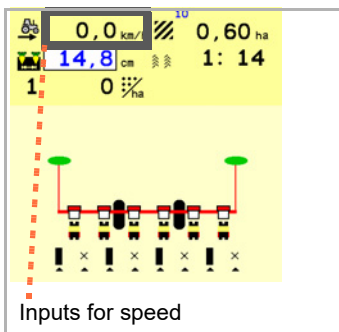
- The machine must be stationary.
- Select the speed with which you will later sow.
- When the seed hoppers are full, seed drops onto the soil upon starting. Place a suitable catch pan under the sowing units to collect the seed.



Observe the Safety Instructions

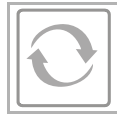
Take heed of the safety instructions on lifted machines. Never go under an unsecured machine.
Serious or fatal injury can result.

- ▶ Lift the machine
 - ▶ Switch on the fan
 - ▶ Press the key
 - ▶ Click on the input field.
A keyboard for inputting values appears.
 - ▶ Input value as desired
 - ▶ Confirm value
- The drive motors start at the pre-selected speed.
- ▶ Press the key again to stop the drive motors



Machines with a 9.00 m PH frame

The menu for folding machines with a 9.00 m PH frame can be reached via a key.



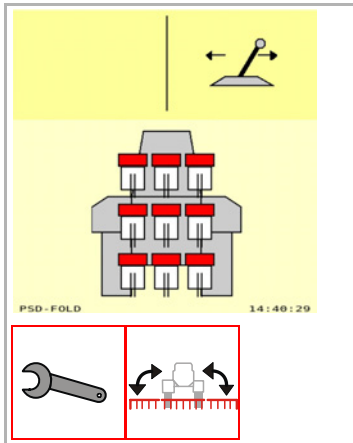
- ▶ Press the key until you reach the folding menu



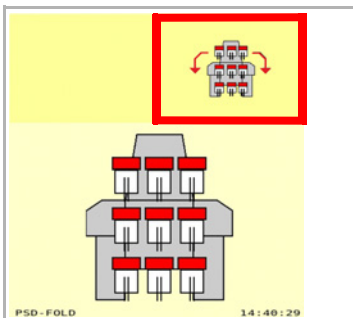
Observe the machine when folding

The machine must be observed constantly when folding. Should irregularities occur, interrupt the process immediately.

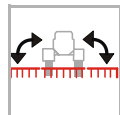
If the process is continued despite a fault, there may be serious damage to the machine.



A simplified diagram of the folded-in machine appears. Machine is folded in. If you can see a picture of the control unit lever on the information screen, hydraulic folding is not yet activated.



- ▶ Activate the control unit
- ▶ Check the folding direction on the screen
- ▶ Change the direction if required
- ▶ Press the key to start folding

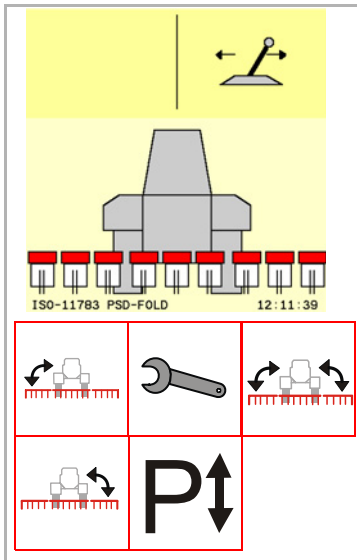


Fold out the machine



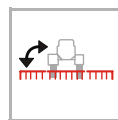
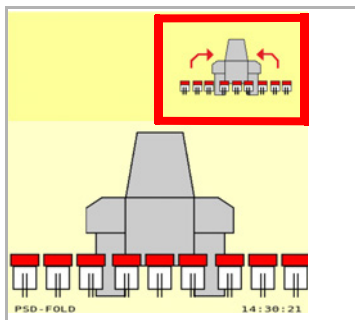
Basic settings

→ Chapter »Software “Folding”«, section »Basic settings«, page 45



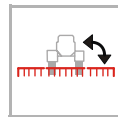
Machine is folded out. If you can see a picture of the control unit lever on the information screen, hydraulic folding is not yet activated.

- ▶ Activate the control unit
- ▶ Check the folding direction on the screen
- ▶ Change the direction if required
- ▶ Press the key to start folding



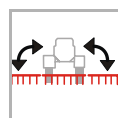
Folding the left side in

- ▶ Actuate the corresponding control unit on the tractor



Folding the right side in

- ▶ Actuate the corresponding control unit on the tractor



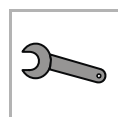
Folding both sides in

- ▶ Actuate the corresponding control unit on the tractor



Setting the pressure

→ Chapter »Software "Folding"«, section »Setting the pressure (Unicorn/Monopill)«, page 44



Basic settings

→ Chapter »Software "Folding"«, section »Basic settings«, page 45

Setting the pressure (Unicorn/Monopill)



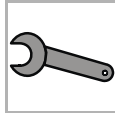
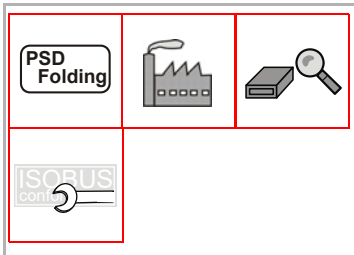
The side sections must be able to swing back and forth. Therefore, it is necessary to apply pressure to the hydraulic cylinder.

- ▶ Select the function and keep the key pressed
- ▶ Observe the pressure values on the manometer. The pressure values are according to the row spacing.

Row spacing [cm]	bar
45	40
50	100

- ▶ Apply pressure to the cylinder via the control unit on the tractor until the manometer displays the desired pressure

Basic settings

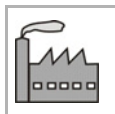


The basic settings of the software “Folding” refer to machine data which is important for controlling functions or triggering alarms.

Keys



To the software “Folding”



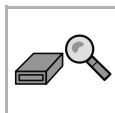
To the service menu

- For the service technician only



Screen and GEOCONTROL settings

→ Chapter »GEOCONTROL«, page 57



To the information menu

→ Chapter »Software “Folding”«, section »Information menu«, page 46

Software “Folding”

Information menu



You can obtain information about the status of the system on the following pages in the menu. This information is generally only of interest to the service technicians.

Page 1

Information about the connections

Software date

PSD Folding

Keys



To the software “Folding”



To the next page

Page 2

PCB ID: 10364994		PSD_FOLD		1.06	
ldr: ldr_esca		1.02		14-11-2007	
ACT-PWR	11,4 V	5V-OUT	5,0 V		
		12V-OUT	11,3 V		
Dig1 0	AD 1	548	Out1		
Dig2 0	AD 2	521	Out2		
Dig3 1	AD 3	536	Out3		
Dig4 0	AD 4	634	Out4		
			Out5		

1	2	3	4
548	521	536	634

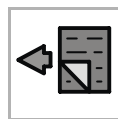
PSD Folding		
-------------	--	--

- Software version
- Software date
- Electrical supply voltage on the hydraulic valves and ECU microcon-
- Fold the left-hand lifting cylinder in and out
- Fold the left-hand balancer cylinder in and out
- Fold the right-hand balancer cylinder in and out
- Fold the right-hand lifting cylinder in and out
- Extend and retract the telescopic thrust cylinder
- 1 Balancer cylinder, right
- 2 Lift cylinder, right
- 3 Balancer cylinder, left
- 4 Lift cylinder, left

Keys



To the software "Folding"



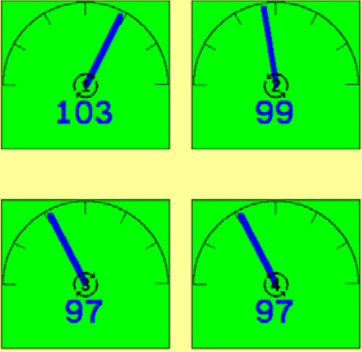
To the previous page



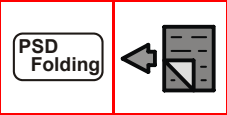
To the next page

Software "Folding"

Page 3



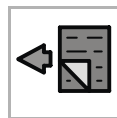
Analogue values of the potentiometer with the frame folded out.
The values should lie between 96 and 103. If the values diverge from this range, the frame must be calibrated. Contact your dealer.



Keys



To the software "Folding"



To the previous page

GEOSEED allows you to influence how the grain is deposited. Without GEOSEED, the individual sowing units of a machine deposit the seed at a specific distance on the field, independently of one another. The point in time at which the individual sowing unit places the seed differs for each sowing unit.

With GEOSEED, the machine's sowing units coordinate the deposition of the seed at a specific point in time. In combination with GEOSYNC, this allows seed to be deposited on the field in a parallel or diamond pattern.

Level I

At level I, seed placement is synchronised for all sowing units in relation to the machine width. When making a pass on the field, all sowing units place the seed at the designated point in time. At level I, there is, however, no synchronisation between subsequent passes on the field.

Level II

At level II, seed placement is synchronised for all sowing units in relation to the width and length of the field. When making subsequent passes on the field, all sowing units place the seed at the designated spot.

Prerequisites

Prerequisites for using level II

- RTK signal with 10 Hz. GPS data without RTK correction is not sufficiently precise for sowing seed.
- GGA protocol
- GPS signal transmission rate 115200 baud or 57600 baud
- GEOSYNC box for making the RTK GPS signal available for ISOBUS machines
- Use of the tractor's steering system and speed control:

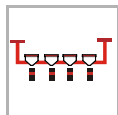
Machine	Speed [km/h]
Optima	7 – 9
Unicorn	2 – 7
Monopill	5 – 7

Settings

Annotations for the screenshot:

- Activate or deactivate RTK signal for GEOSEED Level II
- Green = GEOSYNC box detected
- Red = GEOSYNC box not detected
- Display of the GPS signal quality and display of the number of satellites
- Display showing the AB line coordinates
- Information for the service technician
- Comparison of nominal values with actual values

Keys



To the information screen
 → Chapter »“e-drive II” software«, section »Information screen«, page 7



Reset the coordinates for the machine's AB line. AB lines are required for the tractor's automatic steering system and for GEOSEED with the machine. An AB line is created with the tractor and the automatic steering system. At the same time, the AB line can be created for GEOSEED with the machine.
 → Tractor operating manual

Information about the AB line

An AB line for the machine must fulfil the following criteria:

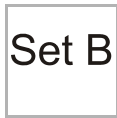
It must lie parallel to the subsequent tramlines created during sowing.
It is not possible to travel at a right angle (for example, at the headland).
It runs straight between 2 points.
An AB line must not follow any curves, bends or wavy lines.
It is at least 20 m long.
An AB line should essentially be longer than 20 m, and it must not be chosen if it is shorter than 20 m.



This key is only visible if a corrected GPS signal is available.

- Starting point for the AB line

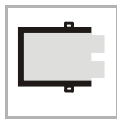
The starting point for the AB line can be created at the same time as the starting point of the AB line for the tractor.



This key is only visible if a corrected GPS signal is available and the "Set A" key has been pressed.

- End point for the AB line

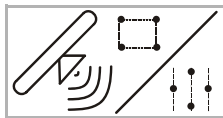
The end point for the AB line can be created at the same time as the end point of the AB line for the tractor.



GEOSYNC inputs

→ Chapter »GEOSEED«, section »GEOSYNC«, page 56

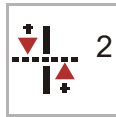
Symbols



If you have activated the RTK signal, you must also calibrate the machine's travel sensor. If the RTK signal fails during sowing, the signal from the machine's travel sensor is automatically adopted.

→ Chapter »"e-drive II" software«, section »Symbols«, from page 29

Correction



When sowing with GEOSEED Level II, a correction must be carried out to ensure that each pass on the field runs with the correct values. This notifies the system of any deviations, which are automatically adjusted after the correction.

Prerequisite for the correction:

- AB lines have been created
- Tractor operating manual

Active correction

Speed during sowing. This speed must match the speed of the tractor.

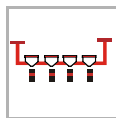
Calculated correction

Display of the sowing distance

Display of the direction of travel from A to B or B to A

Enter offset [cm] above or below the reference from the first pass.

Keys



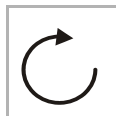
To the information screen
→ Chapter »“e-drive II” software«, section »Information screen«, page 7



To the previous page



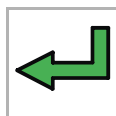
To the next page



Calculate correction

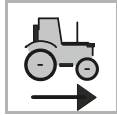


Delete values



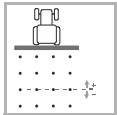
Confirm the selected storage location
You activate the storage location for the subsequent correction.

Symbols



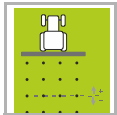
Specify the speed at which you wish to sow. Ensure that the selected speed is not too high, in order to limit deviations in sowing distance when seed is placed in the row. We recommend a speed of 5 km/h. If you are working with level II, select the speed according to machine type.

→ Chapter »GEOSEED«, section »Level II«, page 49



Specify the offset for the grain deposit. The offset is calculated from the difference in grain deposit between the first and the second pass. Prerequisites for the first and second pass:

- The tractor's automatic steering system is activated
- The marks must run in a straight line
- The marks from the first and second pass must run parallel to each other, with a maximum deviation of 10 cm.
- The deposit depth of the sowing units corresponds to the desired deposit depth and is not corrected later
- During the passes, the display of the symbol must be shown in green



- ▶ Make a complete first pass with the machine and a second pass of at least 20 metres on a level field. Travel at the specified speed. While applying seed.



For a simple and reliable correction, we recommend that you choose the parallel formation pattern for the first and second pass. If you want to sow in the diamond formation pattern, select the diamond formation after the correction.



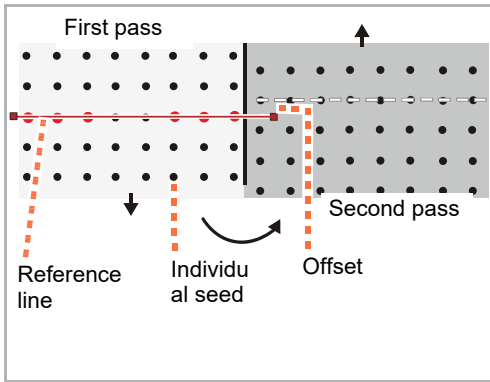
Select the correct sowing units for the diamond formation pattern

If you also select the diamond formation pattern for the first and second pass, please be aware that only every second sowing unit is available for finding a reference line. For the second pass, the selection of the correct sowing units in this reference line is particularly important for the correction.

If an incorrect selection is made, the correction will be inaccurate.



The synchronisation of the sowing units is completed approx. 5 m after the seeding machine has been lowered. Start looking for seed on the field at least 10 m from the point at which the seeding machine was lowered. A forward and return pass to determine the correction is not suitable for precise seed placement. It is generally not possible, therefore, to cut the plants at right angles to the direction of travel for these two passes.



- ▶ Select the reference line at right angles to the direction of travel. A reference line consists of the seeds placed from at least three sowing units on both outer sides of the seeding machine. The reference line should be far enough away from the stopping point of the tractor so that it is within the normal working speed and not in the area of the tractor's braking distance.

A test kit was supplied with the machine and contains the following:

- Small shovel for exposing the individual seeds
- Marking rods for tensioning the white line
- White cord for creating a connecting line
- Yard stick for measuring

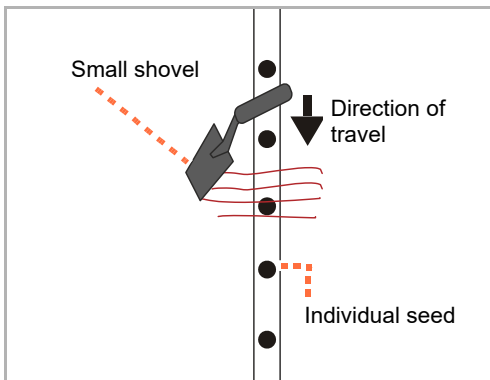


Do not move the individual seeds away from the placement point

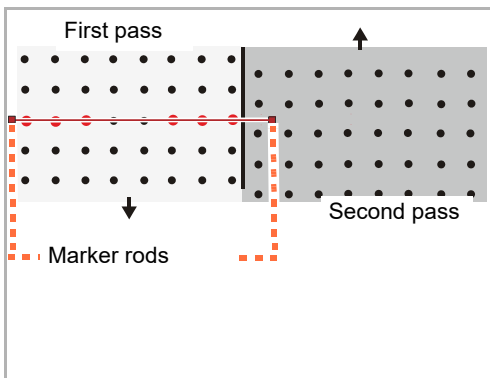
You can use the small shovel from the test kit to find the individual seeds.

To prevent the individual seeds from being moved away from the placement point, dig transversely to the direction of travel. If you dig in the direction of travel, the individual seeds can easily be moved away from the placement point, with the result that the reference line is also moved out of position.

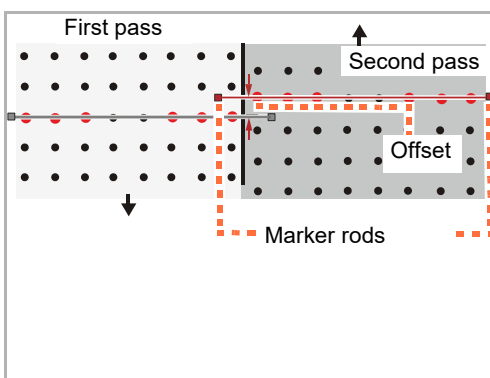
If the individual seeds are moved out of position, the correction will be inaccurate.



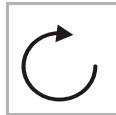
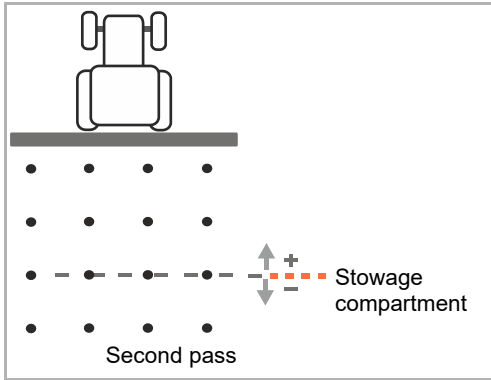
- ▶ Use the small shovel to expose the individual seeds from the reference line of the first pass



- ▶ Use two marker rods and the white cord to identify the position of the individual seeds
- ▶ Expose the individual seeds from the second pass close to the reference line. For this, select at least three sowing units on both outer sides of the seeding machine from the second pass.



- ▶ Using two more marker rods and the white cord, identify the position of the individual seeds that lie on the line of the second pass
- ▶ Measure the offset with the yard stick



- ▶ Enter the value in centimetres. Using the plus/minus signs, you can also determine the direction in which the placement of the individual seeds is moved (in direction of arrow):

+	Move seed placement towards the tractor
-	Move seed placement away from the tractor

- ▶ After entering the information, save the inputs. Upon confirmation, the correction is made automatically.
- ▶ To check the situation, repeat the placement after at least another 20 metres of the second pass

GEOSYNC

The GEOSYNC module is required for the provision of the corrected GPS signal and for determining the position of the tractor.

GEOSYNC INFO	
HW Version:	ECU PWR: 0,0 V
HW Version:	PWR 5V: 0,0 V
Serial nr.:	PWR 3V3: 0,0 V
	Runtime: 0 s
IMU operating mode	
Normal	
IMU orientation	
	Pitch: -179 deg
	Yaw: 0 deg
	115200

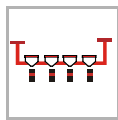
Information for the service technician

Information for the service technician

Choice of installation position for the GEOSYNC module in the tractor

Choice of baud rate. Factory setting 115200.
 Activate the data transfer in the tractor's software and select the GGA protocol with 10 Hz. There, select the same Baud rate as here in the GEOSYNC software.

Keys



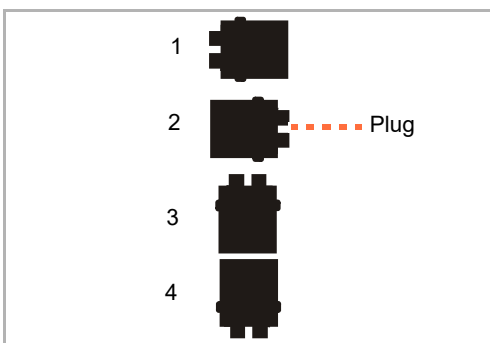
To the information screen
 → Chapter »e-drive II" software«, section »Information screen«, page 7



To the GEOSEED screen
 → Chapter »GEOSEED«, page 49

Symbols

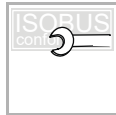
Installation position of the GEOSYNC module in the tractor. The view is from above, looking down on the GEOSYNC module. To identify the installation position, sit on the tractor's seat, facing the front in relation to the direction of travel.



The position of the plugs on the GEOSYNC module is decisive:

- 1 = Plug left
- 2 = Plug right
- 3 = Plug front
- 4 = Plug rear

► Select the position of the plugs on the GEOSYNC module



The screen and GEOCONTROL settings can be configured here.

Page 1

1 — Current screen

120 — Waiting time for information from connected implements. Not adjustable.

2 — Select screen

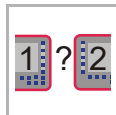
Keys



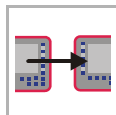
To the information screen
→ Chapter »Switching on«, section »Opening screen«, page 6



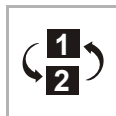
To the next page



Current numbering of the screens



Move the screen to a different terminal



Replace the contents of the screen:

Screen	Replace with screen
Top	Bottom
Left	Right

Page 2

Select TaskControl

Task management using TaskControl

Activating the automatic transfer of the seed spacing from area maps

Select automatic switch-off of sowing units

Enter licence key

Enter number of sowing units

Input the "functional instance" number from the terminal here. The number must be the same as the number of the terminal from which TaskControl is started.



Changes with TaskControl selected:

If you change the software inputs, you will be prompted to confirm whether you would like to adopt the changes in TaskControl.

Page 3

Selecting the type of machine: Attached or trailed

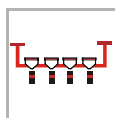
Lateral offset from the centre of the tractor to the coupling point

Distance from the connection point on the tractor to the centre of the machine's seed coulters

"T-ON": The metering device is switched on in advance

"T-OFF": The metering device is switched off in advance

Keys



To the information screen

→ Chapter »Switching on«, section »Opening screen«, page 6

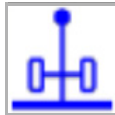


To the previous page



To the next page

Symbols



Selecting a trailed machine

Ai	<input type="text" value="0.00"/>	m
Bi	<input type="text" value="0.1"/>	m
Ci	<input type="text" value="0.0"/>	m

Ai: Enter the lateral offset from the centre of the tractor to the coupling point in metres

Bi: Enter the distance from the centre of the axle on the tractor to the centre of the seed coulters on the machine in metres

Ci: Enter the distance from the connection point on the tractor to the centre of the axle in metres.



Selecting a hitched machine

Ai	<input type="text" value="0.00"/>	m
Bi	<input type="text" value="0.1"/>	m

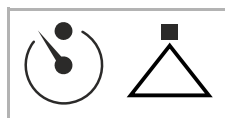
Ai: Enter the lateral offset from the centre of the tractor to the coupling point in metres

Bi: Enter the distance from the connection point on the tractor to the centre of the machine's seed coulters in metres



“T-ON”: The seeding machine is to apply seed starting from a particular point, for example after leaving the headland.

To do this, the machine must already be delivering seed before that point is reached. A time is needed to transport the seed to the coulters. Specify the time here in seconds when the machine should start delivering seed before the point is reached. You will thereby ensure that the seed has arrived at the coulters when the point is reached.



“T-OFF”: The seeding machine is to apply no seed starting from a particular point, for example when reaching the headland.

To do this, the machine must already have stopped delivering seed before that point is reached. A time is needed to transport the seed to the coulters.

Specify the time here in seconds when the machine should stop delivering seed before the point is reached. You will thereby ensure that no more seed arrives at the coulters when the point is reached.



The “T-ON” and “T-OFF” times are dependent on a number of factors. For example:

- Driving speed when reaching the point at which seed is to be applied – “T-ON” or no more seed is to be applied – “T-OFF”
- Type of seed
- Nature of the seed

The guide values are only indications, and adjustment on the field is required in all cases.

	“T-ON”	“T-OFF”
Guide value [s]	0,4	0,6

ISOBUS Certification

E_DRIVE_2
E_DRIVE_2
1.9.0.3 2020-03-23

AEF Certified:

ISOBUS

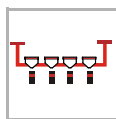
TC-BS TC-BE TC-SC

www.aef-isobus-database.org

Current software version

Display showing ISOBUS version

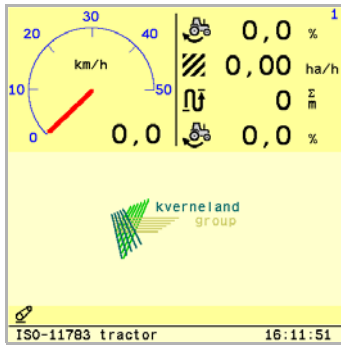
Keys



To the information screen
→ Chapter »Switching on«, section »Opening screen«, page 6



To the previous page



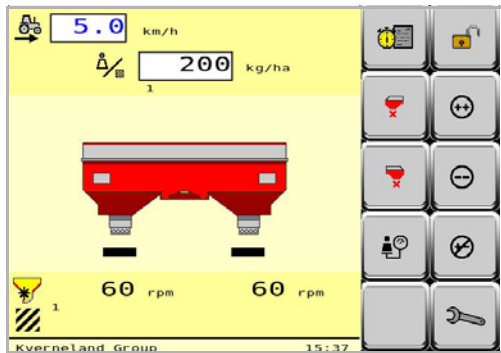
You will find an explanation of the keyboard area and symbols in a separate operating manual.

→ "IsoMatch Tellus" operating manual

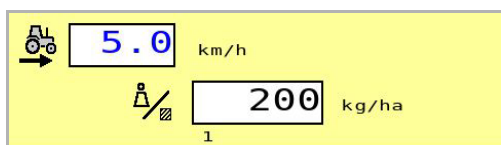
"e-drive fert" software

The application of fertiliser is controlled by the "e-drive fert" software. To view the "e-drive II" and "e-drive fert" software displays simultaneously on one screen, the terminal must be configured accordingly. To use the "e-drive fert" software, a terminal with two displays can be beneficial.

"Fertilising" screen

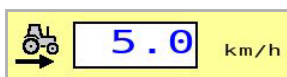


The "Fertilising" screen displays all of the most important values during fertilising work.

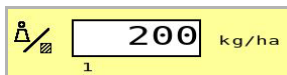


The upper section of the screen shows current values during the work. In addition, the amount of fertiliser applied for the metering devices is displayed. The values change when activating an increased or decreased amount during seeding.

You can change the application amount of fertiliser also by inputting the quantity directly. Exceeding or not reaching the amount from the calibration test by more than 50% is not possible.

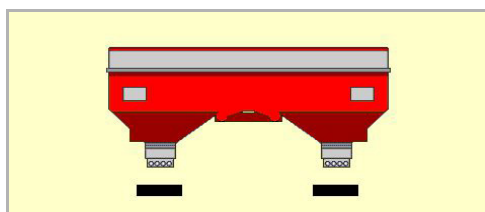


Speed in km/hour



Amount of fertiliser kg/ha

- The amount of fertiliser actually set is displayed.



The central area of the "Fertilising" screen shows the fertiliser spreader and information about the metering devices.



The lower section of the "Fertilising" screen shows you the current status of the fan and cultivated area.



Rotational speed at shaft of metering devices in revolutions per minute



Cultivated area, in ha

The figure indicates the number of the active task from the "Task" menu.

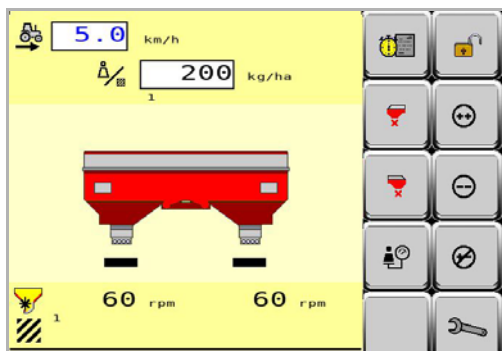


"Stop" message



The "Stop" message appears automatically if the metering device is not turning.

Functions and settings



You can use the keyboard area beside the screen to activate different functions and implement additional settings.

Keys



Task processing

When TaskControl is activated, the symbol is not visible.

→ Chapter »"e-drive fert" software«, section »Task processing«, page 66



Beware of persons in the vicinity of the machine

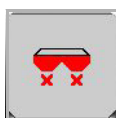
Before releasing the drive motors, check whether there are any persons in the vicinity of the machine. Only release the drive motors when no persons are, or will be, in the vicinity of the machine.

Persons who come into contact with the drive shafts may be pulled in by them and be seriously injured. Persons who perform work on electrically powered sowing units may sustain cutting injuries.



Release the drive motors.

When the machine is stationary, the drive motors for the metering devices are blocked after 30 seconds. You can release the drive motors once again. In electrically powered sowing units, the drive motors on the sowing units are also released simultaneously.



Switch the metering device or metering devices off or on
The display flashes if the metering device is switched off.



Switch the left-hand metering device off or on
The display flashes if the metering device is switched off.



Switch the right-hand metering device off or on
The display flashes if the metering device is switched off.



Start the metering device manually

Manual starting remains active for 20 seconds or until the actual speed exceeds the preselected speed.



Increase application rate by a defined percentage

Exceeding the amount from the calibration test by more than 50% is not possible.



Decrease application rate by a defined percentage

Not reaching the amount from the calibration test by more than 50% is not possible.



Reset the application rate to the normal value.



Calibration test

→ Chapter »"e-drive fert" software«, section »Calibration test preparation«, page 67



Basic settings

→ Chapter »"e-drive fert" software«, section »Basic settings«, page 72

"e-drive fert" software

Task processing



Twenty different tasks can be stored at once. For each task, the following information is recorded from the start of the task:

1	2	3	4	5	6
→	2017-11-27	14:46			
→					
☒	0 : 00	h:m			
☒	7 : 31	h:m			
▨	0,00	ha			
🚛	0,027	km			
👤	0	kg			

Start of task: Date and time

Period of time the machine was in operation

Period of time the machine was not in operation

Cultivated area, in ha

Kilometres driven

Amount of fertiliser spread in kg (calculated)

Keys



The task is only completed if a new task has been selected.



To the information screen



To the previous task



To the next task



Delete data



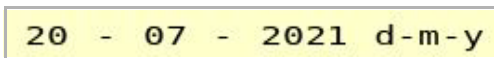
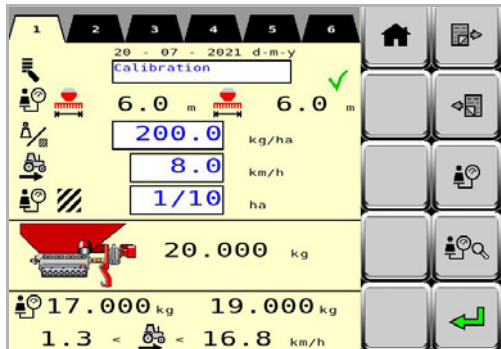
Start the task

To the information screen. The active task is shown as a number in the information screen.

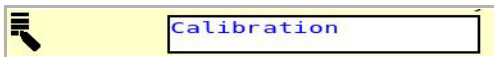
Calibration test preparation



A calibration test must be performed for each fertiliser type.



Date of the current calibration test



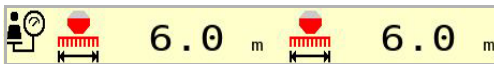
Blank text field for information about the calibration test



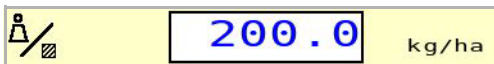
Calibration test not yet performed.



Calibration test performed successfully.



Working width of the last calibration test (left) and actual working width of the machine (right) [m]



Enter the required application rate in kg/ha.



Enter the driving speed

The normal driving speed is roughly 3 km/h less than the maximum speed shown in the seeding machine operating manual. The minimum and maximum speeds are calculated from the normal driving speed.

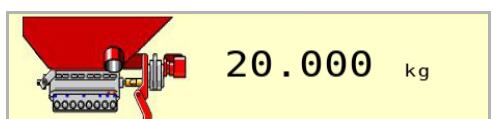


Enter the area for the calibration test

Entries possible between 0.1 and 10 ha.


The larger the area selected, the more exact is the result of the calibration test. The calibration test takes longer, however, and the amount of fertiliser becomes greater.

Tip: Do not fall below the value of 0.10 ha.



When creating a new calibration test, the estimated amount for weighing is displayed

"e-drive fert" software

 17.000 kg 19.000 kg

Fertiliser weight after the calibration test (no entry here)

1.3 <  < 16.8 km/h

Minimum and maximum driving speed [km/h]
If the limits are not reached or exceeded, an alarm is triggered.



Several calibration tests can be generated. If the fertiliser is the same and has the same properties, the values of a calibration test already performed can be used.

- Carry out a new calibration test each time the fertiliser or the working width is changed.

Keys



To the information screen



To the next calibration test.



To the previous calibration test.



Start the calibration test.



Start the test run.



Accept the calibration test values.
Only possible after successful calibration test. The values are then adopted as the basis for the fertiliser application.

Carrying out the calibration test

Prerequisites

- ▶ Fill the fertiliser hopper with a minimum quantity of fertiliser.
Tip: Fill the fertiliser hopper up to around the removable sieves.
 - ▶ Fold the machine into its work position and secure it.
- »Precision seeding machine« operating manual
- ▶ Hook the catch pan on below the metering devices and secure it in place.
 - ▶ Actuate the control valve on the tractor for the hydraulic functions.

The following values must be entered at the terminal:

Input	Example
Text field	NPK
Application rate [kg/ha]	200
Speed in km/hour	8
Surface area for the calibration test [ha]	0,10

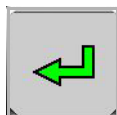
Filling the cell wheels



On machines with two drive motors for applying fertiliser, carry out one calibration test for each side of the machine. Before the calibration test on one side of the machine, close the stoppers on the metering device for the other side of the machine.



Start the calibration test.



Start filling.



Abort filling.



- ▶ Start the filling of the cell wheels.
- ▶ After filling, put the control valve on the tractor for the hydraulic functions into neutral position.
- ▶ Empty the catch pan and place it back under the metering devices.
- ▶ Actuate the control valve on the tractor for the hydraulic functions.

"e-drive fert" software

Calibration



Start calibration.



Abort calibration.



Pause
Press again to continue the calibration.



► Start calibration.

After calibration, the fertiliser from the catch pan must be weighed.



► Enter weighing result in kg and confirm on the terminal.



For a calibration test for just one side of the machine in each case, enter the weighing result for each side in kg without additional calculations. The software carries out the calibration test for each side of the machine for the total entered area, meaning that the value may appear larger than expected.



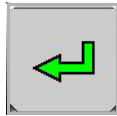
One of the values expected by the software is displayed in the terminal. The amount weighed may deviate from the desired amount. For example, if 200 kg/ha of fertiliser are to be applied, but the amount weighed at 0.10 ha corresponds to only 18 kg instead of the expected 20 kg, this is then not an error. Please enter the result of the weighing from the calibration. Not until the test run is a working run simulated with the set values. Therefore always perform a test run.



Confirm the input

Test run

A test run is advisable, especially if a calibration test using fertiliser from a different source from the current fertiliser is to be adopted.



Start the test run.



Abort the test run.



Pause
Press again: Resume calibration.



When calibrating small amounts, as is the case for rape or grass, select a larger area for the calibration test. At least 0.5 ha.



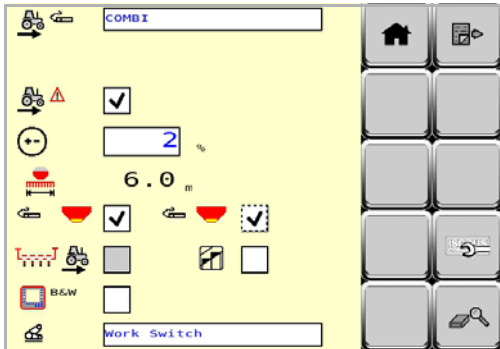
- ▶ Place a catch pan under the metering device or devices.
- ▶ Enter the area for the calibration test, in this case 0.10 ha.
- ▶ Actuate the control valve on the tractor for the hydraulic functions.
- ▶ Start the test run.
- ▶ Weigh the fertiliser from the catch pan and compare it with the nominal value.
- ▶ If there are any deviations, perform a new calibration test.

"e-drive fert" software

Basic settings



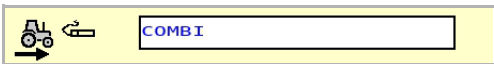
Basic settings refer to machine data which is important for controlling functions or triggering alarms. Basic settings are spread over a number of pages.



Activating or deactivating:

Activate	=	Tick in box
Deactivate	=	No tick in box

Screen page 1



Select the type of speed sensor:

• Drive wheel	Seeding machine drive wheel
• ISOBUS drive wheel	Wheel sensor on tractor Prerequisite: The tractor supports ISOBUS
• ISOBUS radar	Radar sensor on the tractor Prerequisite: The tractor supports ISOBUS
• Manual	No sensor Speed is manually entered and driven with the tractor
• Radar	Radar sensor on the machine
• Combi	Receive the speed signal from the precision seeding machine

For a drive wheel as a speed sensor:

Number of pulses from the drive wheel over 100 m

Preset value (guide value)
9450

For a radar sensor as a speed sensor:

Number of pulses from the radar sensor over 100 m

Preset value (guide value)
19500

You can also use calibration to determine the values in both cases. You usually achieve more accurate results by doing this. Inaccuracies due to factors relating to the ground can be adjusted by calibration.

- ▶ Exactly measure off 100 m on the field.
- ▶ Fold the machine into its work position.
- ▶ Activate "Start" and drive the measured 100 m.
- ▶ Activate "Stop".

The number of pulses will be indicated. Confirm the value with "OK".



Activate or deactivate the alarm if the target speed is not reached or is exceeded.

The alarm is triggered if the speed for the exact application of the fertiliser is too low or too high.

Tip: Always switch on the alarm.



Percentage steps for increased and decreased amounts

Enter the desired percentage steps here for the increased and decreased amounts for fertiliser application. The amount of fertiliser is increased or decreased in the information screen by the percentage using the appropriate keys.

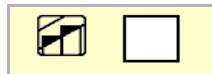
Chapter »"e-drive fert" software«, section »Task processing«, page 66



Working width of the machine in metres



Activate or deactivate the sensor in the fertiliser hopper



Activate or deactivate the automatic switch-off

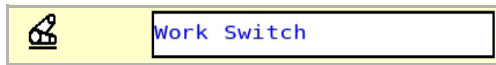
When activated, the fertiliser application switch-off is connected to the software "e-drive II". When switching off sowing units using the "e-drive II" software, the application of fertiliser is also switched off:

Application of fertiliser	
Switching off	Switching on
The last sowing unit is switched off	One sowing unit is switched on

"e-drive fert" software



Activate or deactivate black/white mode on the display



Set the type of sensor that will switch the drive motor for the metering devices on or off:

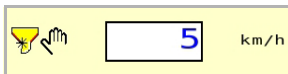
• e-drive	Control of the sowing units, as with the drive motors. All drive motors switch on or off simultaneously.
• Work position	Control via sensors on the machine's lifting cylinder
• ISO11783 work position	Control via sensors on the tractor Prerequisite: The tractor supports ISOBUS

Screen page 2



Activate or deactivate fertiliser application

Screen page 3



Preselection of the speed when driving off with the machine lowered. Manual starting remains active for 30 seconds or until the actual speed exceeds the preselected speed.



This speed must be lower than the intended driving speed during sowing.



Activate or deactivate the automatic pre-metering

Automatic pre-metering activates once the starting conditions have been met and the driving speed has exceeded the 0.5 km/h threshold. The present application rate is adjusted to the preset driving speed.

The function remains active for a maximum of 20 seconds, or until the actual driving speed reaches the preset driving speed.

The AUTO symbol appears on the main screen for as long as automatic pre-metering remains active.

Keys



To the information screen.
→ Chapter »"e-drive fert" software«, section »Task processing«, page 66



To the previous page.



Go to the next page.
A PIN code for the service technician is required on the next pages. Subsequent pages show special information about individual sowing units, motors and sensors. This information is intended for the service technician.



Restore factory settings.
All inputs are reset to the stored factory setting.



- Screen and GEOCONTROL settings.

→ Chapter »GEOCONTROL«, page 57



- To the information menu.

→ Chapter »"e-drive fert" software«, section »Information and testing«, page 76



"e-drive fert" software

Information and testing



- The software version of the machine
- Performance data of the machine
- Information for the service technician

Information Page 1

 E_DRIVE_FERT 1.7.0.6.b	 INT EXT 2020-09-03	Software version of the machine It may be necessary to know the software version when you call the technical customer service.
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Information Page 2






One motor for the metering devices

E_DRIVE_FERT 1.7.0.6.b	ID 0003029394 2020-09-03	
ECU-PWR 11.7 V 12V-OUT 11.4 V	ACT-PWR1 13.7 V	Display of the power supply to the ECUs [V]
LANDWHEEL 1 METERING L 1 SEED LOW L 0 WORK SWITCH 1	SHUT OFF 1207 SEED LOW R 0	Display of connected sensors 0 = active 1 = inactive or not connected
MOTOR L <input type="checkbox"/>		Activate or deactivate the motor test
TRC MRK DIR <input type="checkbox"/>	LIFT MRK <input type="checkbox"/>	
MOTOR <input type="text" value="60.00"/>	60.76 rpm 0 %	Speed [rpm] of the motor at the metering device Input of the rotational speed [rpm] at which the metering device motor is to turn

Two motors for the metering devices

E_DRIVE_FERT 1.7.0.6.b	ID 0003029394 2020-09-03	
ECU-PWR 12.8 V 12V-OUT 12.7 V	ACT-PWR1 13.0 V	Display of the power supply to the ECUs [V]
LANDWHEEL 1 METERING L 1 SEED LOW L 1 WORK SWITCH 1	SHUT OFF 1103 METERING R 1 SEED LOW R 1	Display of connected sensors 0 = active 1 = inactive or not connected
MOTOR L <input checked="" type="checkbox"/>	MOTOR R <input checked="" type="checkbox"/>	Activate or deactivate the motor test. Left-hand motor for the metering device on the left in relation to the direction of travel. Right-hand motor for the metering device on the right in relation to the direction of travel.
TRC MRK DIR <input type="checkbox"/>	LIFT MRK <input type="checkbox"/>	
MOTOR <input type="text" value="31.00"/>	31.03 rpm 0 %	Speed [rpm] of the motors on the left- and right-hand metering devices Input of the rotational speed [rpm] at which the motors on the metering devices are to turn

Information Page 3

Σ 	<input type="text" value="22"/>	h	Total working time of the machine in hours [h]
Σ 	<input type="text" value="0.72"/>	ha	Total output of the machine in hectare [ha]
 10 ha: 00-00-1985 d-m-y		Date when a total area of 10, 100 and 1000 ha was achieved	
 100 ha: 00-00-1985 d-m-y			
 1000 ha: 00-00-1985 d-m-y			
PIN:	<input type="text" value="0"/>		PIN: Enter for the service technician only

Keys



To the information screen.

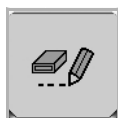
→ Chapter »"e-drive fert" software«, section »Task processing«, page 66



To the previous page.



Go to the next page.



To the results screen.

→ Chapter »"e-drive fert" software«, section »Events«, page 78

"e-drive fert" software

Events

All events are logged with a time stamp on these pages.

Events	Counter	Time stamp
E_DRIVE_FERT 1.7.0.6.b	2020-09-03	
Speed High	33	2019-02-08 13:09:11
Speed Low	2	2017-06-09 13:34:17
Seed L Low	26	2020-10-22 14:49:24
Seed R Low	18	2020-10-22 14:49:24
Motor L High	127	2021-05-18 7:47:20
Motor R High	25064	2018-08-05 8:39:05
Motor L Low	25087	2021-07-20 14:26:20
Motor R Low	27638	2019-01-31 8:38:13
Motor L X	20409	2021-07-20 14:23:14
Motor R X	27642	2019-02-03 8:38:13
RPM L wrong	27664	77.710 h
RPM R wrong	25065	296.170 h
Calib. Fails	25069	2021-05-18 9:38:29
ActPwr Low	7	2019-03-01 10:10:22
EcuPwr Low	9	2018-08-26 21:57:05
Out12V Low	32	2018-08-26 21:57:11



To the information screen.
→ Chapter »"e-drive fert" software«, section »Task processing«, page 66



To the previous page.



Go to the next page.



Basic settings.
→ Chapter »"e-drive fert" software«, section »Basic settings«, page 72



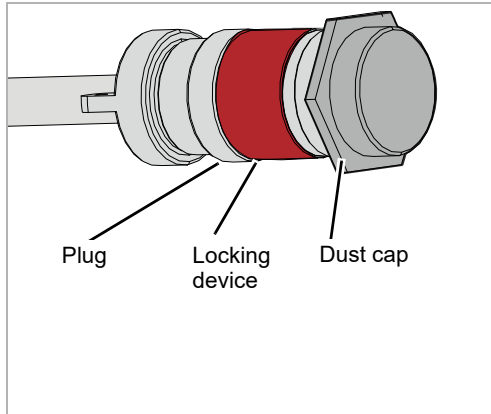
- To the information menu.
→ Chapter »"e-drive fert" software«, section »Information and testing«, page 76

Removal

To remove, unplug the following two plugs:

- The plug on the cable from the machine to the tractor ECU
- The plug on the cable for the power supply for the terminal

Tractor ECU



- ▶ Release the securing mechanism on the plug and remove the plug carefully.
- ▶ Place the dust cap on the plug immediately and secure in place. The plug is very sensitive to mechanical influences and is easily damaged without a dust cap.


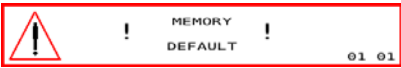
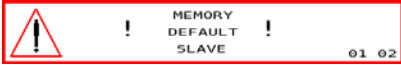
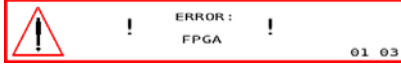

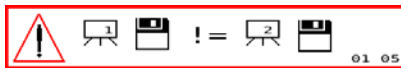
Eliminating faults

Faults can often be eliminated in a fast and easy manner. Before calling Customer Service, refer to the table below to check whether you can eliminate the fault yourself.

Fault	Cause	Remedy
The implement cannot be switched on.	The poles of the supply voltage are reversed.	<ul style="list-style-type: none"> • Have the polarity checked.
	Power supply interrupted.	<ul style="list-style-type: none"> • Check the connection cable. • Check the terminals on the battery. • Check the fuse. • If required: Replace the 30 A fuse. • Connect the power cable if the power supply was disconnected. • Check the voltage: The supply voltage must be 12–14 V.
	System failure.	Inform customer service.
No read out on the display.	The contrast regulator is set incorrectly.	Make adjustments until the display text is visible.
	Display does not receive a pulse.	Start the device again. After restarting, if there is still nothing in the display or the display cannot be changed, send the device back to the manufacturer.
Terminal displays unexpected values.	A mobile phone, radio or radio antenna is operating too close to the device.	Keep a minimum distance of 1 m.
Speed is not displayed or is displayed too low.	Calibration not performed.	Perform calibration.
	No pulse input.	Enter a pulse.
	Cable on the wheel sensor is defective or the wheel sensor is defective.	Check the cable and replace if necessary.
	The device is defective.	Inform customer service.






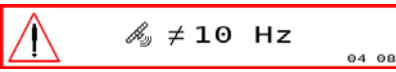
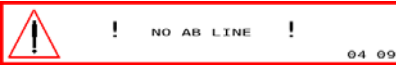

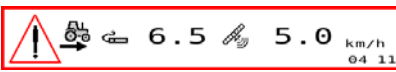
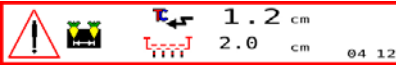
Fault	Cause	Remedy
The opto-sensor does not send signals to the job computer.	Opto-sensor defective.	Inform the dealer.
	Opto-sensor is dirty.	Clean the opto-sensor with a brush.
Number of grains/ha fluctuates strongly.	Irregular separation of the seeds.	Set the sowing units correctly.
	Opto-sensor is dirty.	Clean the opto-sensor with a brush.

“e-drive II” software


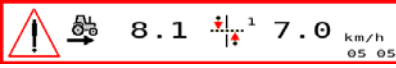
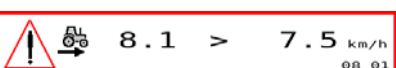
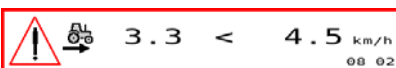
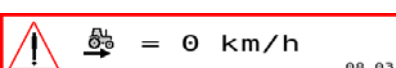
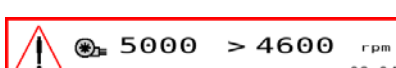
Fault	Cause	Remedy
Alarms can be confirmed with the “OK” key. The audible warning signal will stop and you can look for and eliminate the cause of the alarm without being disturbed.		
	Limit switch triggered during sowing. The machine is most likely working too low. Note: This symbol may also appear as a warning when raising the frame.	Check the depth setting of the machine and correct as necessary. Check the settings of the limit switch on the unit.
	Alarm ID: 01-01 The entries in the memory could not be restored. The memory was reset to the standard values.	Re-enter the machine data.
	Alarm ID: 01-02 The entries in the slave computer could not be restored. The memory was reset to the standard values.	Re-enter the machine data.
	Alarm ID: 01-03 Hardware error on the main PCB.	Re-start Inform the Customer Service
	Alarm ID: 01-04 Hardware error on the slave PCB.	Restart. Check the machine data. Inform customer service.
	Alarm ID: 01-05 Different software versions in the main boxes.	Inform customer service.

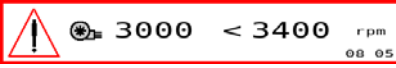






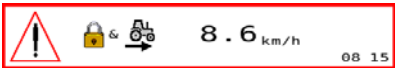
Eliminating faults

Fault	Cause	Remedy
	Alarm ID: 01-08 The selected language or measurement units on the terminal does/do not match the main box.	Select the supported language or measurement units on the terminal.
	Alarm ID: 02-01 Drive motor does not run. Seed disc is blocked.	Check the connection cable. Check the fuses. Check the seed disc and remove the blockage.
	Encoder defective.	Replace the defective motor.
	Alarm ID: 02-02 The seed disc turns too slowly or the driving speed does not match the sowing distance entered.	Check the seed disc and remove the blockage. Use a seed disc with fewer holes. Increase the driving speed. Reduce the sowing distance.
	Alarm ID: 02-03 The seed disc turns too quickly or the driving speed does not match the sowing distance entered	Use a seed disc with more holes. Reduce the driving speed. Increase the sowing distance.
	Alarm ID: 02-04 Difference in relation to the target speed.	Check the seed disc and remove the blockage. Check the drive motor. Inform customer service.
	Alarm ID: 02-06 One of the motors is put under an average load of more than 4 A	Check the seeding heart for blockages Check the drive motor
	Alarm ID: 03-03 The supply voltage in the main box is too low	Check the battery Replace the fuse if the indicator shows "0"
	Short-circuit in individual sensors	Disconnect all sensors and reconnect them in succession
	Alarm ID: 03-08 The supply voltage in the PEM main box is too low	Check the battery Replace the fuse if the indicator shows "0"


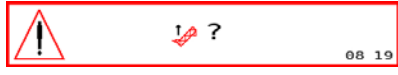


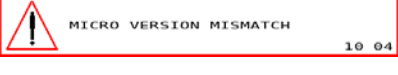

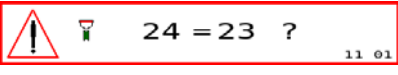
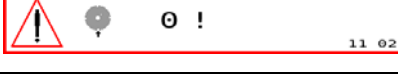
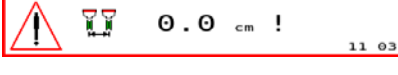
Fault	Cause	Remedy
	Alarm ID: 04-01 TaskControl software test period is due to expire or has expired.	If you would like to continue to use the software, please purchase a licence key.
	Alarm ID: 04-02 Changes to the machine settings with TaskControl selected.	Confirm the message to adopt changes in TaskControl. Choosing not to adopt the values can lead to undesirable seed results.
	Alarm ID: 04-05 It is not possible to use GEOCONTROL.	If you would like to continue to use the software, please purchase a licence key. Deactivate GEOCONTROL.
	Alarm ID: 04-06 GEOSYNC receives no signals from the GPS aerial.	Check the aerial. Check the GPS settings. Check the cables.
	Alarm ID: 04-07 GPS signal is too weak.	Check the GPS aerial settings. Check the GPS settings (GGA protocol).
	Alarm ID: 04-08 The GPS signal refresh rate does not correspond to the 10 Hz required.	Set the GPS system to 10 Hz.
	Alarm ID: 04-09 No AB line has been created in the GEOSYNC software.	Create the AB line.
	Alarm ID: 04-10 GEOSYNC receives no signals from the main PCB.	Check the cables. Inform customer service.
	Alarm ID: 04-11 The speed sensor detects a different speed to that calculated from the RTK signal.	Calibrate the speed sensor.
	Alarm ID: 04-12 The value for the TaskControl application rate does not correspond to the value for the machine's application rate.	Check the application card. Check the machine's basic settings. Inform customer service.

Eliminating faults

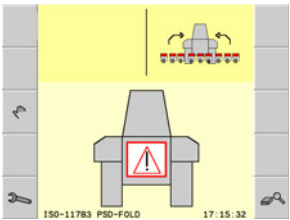
Fault	Cause	Remedy
	<p>Alarm ID: 05-04 The value entered for the application rate differs from the values for the GEOSEED calibration.</p>	<p>Enter the same value for both.</p>
	<p>Alarm ID: 05-05 The current speed differs from the speed entered for GEOSEED calibration by more than 1 km/h.</p>	<p>Maintain the speed via the tractor's automatic steering system.</p>
	<p>Alarm ID: 08-01 The speed when sowing is above the set maximum speed.</p>	<p>Drive slower than the set maximum speed. Change the input for the maximum speed.</p>
	<p>Alarm ID: 08-02 The speed when sowing is below the set minimum speed.</p>	<p>Drive faster than the set minimum speed. Change the input for the minimum speed.</p>
	<p>Alarm ID: 08-03 No speed signal and the machine is in work position.</p>	<p>For the wheel sensor on the machine: Check that the wheel has permanent contact with the ground. Check the sensor connection cable. Test the sensor in the diagnostics menu.</p>
	<p>Alarm ID: 08-04 The fan speed is too high.</p>	<p>Keep the fan speed within the target range. For precision seeding machines, the fan speed is dependent on the vacuum required on the sowing units. The vacuum can be read on the manometer. → Operating manual for the machine An entry for monitoring the fan speed is therefore only of limited use. → Chapter »e-drive II" software«, section »Basic settings«, page 23</p>

Fault	Cause	Remedy
	<p>Alarm ID: 08-05 The fan speed is too low.</p>	<p>Keep the fan speed within the target range. For precision seeding machines, the fan speed is dependent on the vacuum required on the sowing units. The vacuum can be read on the manometer. → Operating manual for the machine An entry for monitoring the fan speed is therefore only of limited use. → Chapter »e-drive II" software«, section »Basic settings«, page 23</p>
	<p>Alarm ID: 08-06 Fertiliser hopper almost empty.</p>	<p>Fill the fertiliser hopper.</p>
	<p>Alarm ID: 08-07 The metering device is not working.</p>	<p>Check the setting.</p>
	<p>The sensor on the metering device is defective.</p>	<p>Replace the sensor. Check the position of the magnets on the metering shaft.</p>
	<p>Blockage on the metering unit.</p>	<p>Check the metering unit and remove the blockage.</p>
	<p>Alarm ID: 08-09 Patchy seeding when depositing grain.</p>	<p>Check the seed disc and remove the blockage. Clean the opto-sensor. Replenish seed as required.</p>
	<p>Alarm ID: 08-10 Very little seed in the seed hopper.</p>	<p>Replenish seed.</p>
	<p>Alarm ID: 08-11 Pulses on the sensor are missing for synchronising the sowing units.</p>	<p>Check the seed disc and remove the blockage. Inform customer service.</p>
	<p>Alarm ID: 08-12 Too many pulses for synchronising the sowing units were detected.</p>	<p>Check the sensor. Inform customer service.</p>
	<p>Alarm ID: 08-15 Driving with the machine locked.</p>	<p>Release the machine.</p>





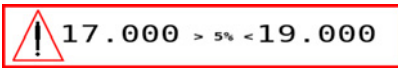
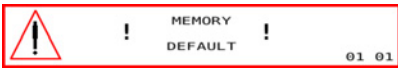
Eliminating faults

Fault	Cause	Remedy
	Alarm ID: 08-18 Double seeding when depositing grain.	Check the scraper settings. → Chapter »e-drive II“ software«, section »Scraper settings«, page 20
	Alarm ID: 08-19 Prompt to determine if the filling auger is already lifted.	Reject or confirm Chapter »e-drive II“ software«, section »Page 2«, page 13 et seq.
	Alarm ID: 10-01 One or more sowing units do not work. Communication between master and slave interrupted.	Check the cables.
	Alarm ID: 10-02 No signals coming from the synchronisation cable.	Check the cables.
	Alarm ID: 10-04 The version of the microgranule distributor software does not correspond to the version of the e-drive II software.	Inform customer service.
	Alarm ID: 10-05 No communication with the software from the microgranule distributor.	Check the cables. Inform customer service.
	Alarm ID: 11-01 Number of sowing units detected differs from the number of sowing units entered.	Enter the correct number. Check the sowing units.
	Alarm ID: 11-02 Number of holes in the seed disc set at "0".	Enter the correct number.
	Alarm ID: 11-03 Distance between sowing units was set incorrectly.	Enter the correct distance.




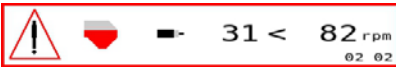
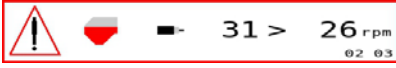
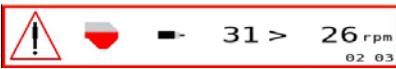

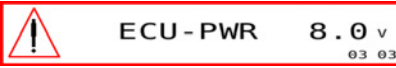
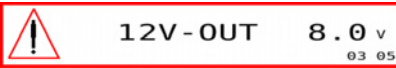
Software “Folding”





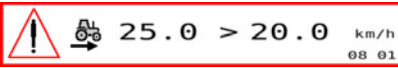
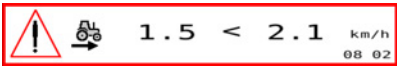
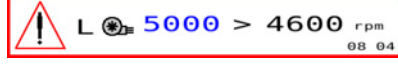



Fault	Cause	Remedy
Alarms can be confirmed with the “OK” key. The audible warning signal will stop and you can look for and eliminate the cause of the alarm without being disturbed.		
	The sensors on the frame are incorrectly set or defective	Set or replace the sensors Manual folding

"e-drive fert" software


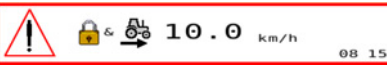

Fault	Cause	Remedy
Alarms can be confirmed with the “OK” key. The audible warning signal will stop and you can look for and eliminate the cause of the alarm without being disturbed.		
	No speed signal.	
	The machine is lifted.	Only an item of information, not an alarm.
	Sensor defective.	Inform customer service.
	The machine was lowered for longer than 30 seconds when stationary.	Release the drive motors.
	Reset to factory settings.	Confirm/Do not confirm
	Save these settings as factory settings.	Confirm/Do not confirm
	The difference in the amount of fertiliser applied between the right- and left-hand metering device is greater than 5%.	Check the metering devices and drive motors.
	Alarm ID: 01-01 The entries in the memory could not be restored. The memory was reset to the standard values.	Re-enter the machine data.

Eliminating faults

Fault	Cause	Remedy
 	<p>Alarm ID: 02-01 Drive motor on the left-/right-hand metering device.</p>	<p>Check the sensor setting Check that the sensor is working properly.</p> <p>Check the supply of oil for the hydraulic drive motor.</p>
 	<p>Alarm ID: 02-02 Due to an excessively low quantity of oil, the number of revolutions on the left-/right-hand metering device is lower than the nominal value.</p> <p>Due to a blockage, the number of revolutions on the left-/right-hand metering device is lower than the nominal value.</p>	<p>Increase the quantity of oil for the metering device. → Chapter »e-drive II“ software«, section »Basic settings«, page 72</p> <p>Remove the blockage from the metering device.</p>
 	<p>Alarm ID: 02-03 Due to an uneven load on the drive motors, the number of revolutions on the left-/right-hand metering device is higher than the nominal value.</p> <p>Due to a defective hydraulic valve, the number of revolutions on the left-/right-hand metering device is higher than the nominal value.</p>	<p>Check the sensor setting. Check that the sensor is working properly.</p> <p>Inform customer service.</p>
	<p>Alarm ID: 03-01 Insufficient voltage supply for the drive motors.</p>	<p>Check the battery. Replace the fuse if the indicator shows "0".</p>
	<p>Alarm ID: 03-03 Rated voltage not reached for the main box.</p>	<p>Check the battery. Replace the fuse if the indicator shows "0".</p>
	<p>Alarm ID: 03-05 Insufficient voltage supply for the 12 V consumers.</p>	<p>Check the battery. Replace the fuse if the indicator shows "0".</p>

Fault	Cause	Remedy
	Alarm ID: 04-02 Changes to the machine settings with TaskControl selected.	Confirm the message to adopt changes in TaskControl. Choosing not to adopt the values can lead to undesirable seed results.
	Alarm ID: 04-12 The value for the TaskControl application rate does not correspond to the value for the machine's application rate.	Check the application card. Check the machine's basic settings. Inform customer service.
	Alarm ID: 05-01 Calibration test not correct.	Perform the calibration test again.
	Alarm ID: 05-06 The current machine width and the machine width from the selected calibration test do not match.	Carry out a new calibration test.
	Alarm ID: 08-01 The speed when sowing is above the set maximum speed.	Drive slower than the set maximum speed. Change the input for the maximum speed.
	Alarm ID: 08-02 The speed when sowing is below the set minimum speed.	Drive faster than the set minimum speed. Change the input for the minimum speed.
 	Alarm ID: 08-04 Fan speed is too high.	Keep the fan speed within the target range.
 	Alarm ID: 08-05 Fan speed is too low.	Keep the fan speed within the target range.

Eliminating faults

Fault	Cause	Remedy
	<p>Alarm ID: 08-06 Left-/right-hand fertiliser hopper almost empty.</p>	<p>Fill the left-/right-hand fertiliser hopper.</p>
	<p>Alarm ID: 08-15 Driving with the machine locked.</p>	<p>Release the machine.</p>
	<p>Alarm ID: 10-06 No connection to the software of the seeding machine.</p>	<p>Check the cables. Inform customer service.</p>

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