Instructions

E-Services

TPF, TPK, TPL, TPV, FH
601010-000050
Version 5.0.2

904190-en-gb; 24.06.2024 04

Original instructions

904190-en-gb; 24.06.2024

Abreviations

Abbreviation	Explanation
A	Amp
ID	Identification
rpm	Rotations per minute
FH	FrontHopper
TPF	Tempo F
TPK	Tempo K
TPL	Tempo L
TPR	Tempo R
TPT	Tempo T
TPV	Tempo V

Contents

1 General safety provisions

1.1 Obligations and responsibilities

These instructions are to be regarded as for guidance only and entail no responsibility whatsoever on the part of Väderstad AB and/or its representatives. Full responsibility for the use, transportation, maintenance and servicing of the machine lies with the owner/driver. These instructions cover a large number of machine configurations.

Local conditions affecting crop rotation, soil type, climate, etc. may require procedures different to those mentioned in these instructions.

It is the full responsibility of the owner/driver to ensure that the machine is used correctly in all respects. The owner is also responsible for ensuring that all individuals who use the machine have read and understood this instruction manual and that they work in accordance with all valid provisions and regulations.

If an individual working with the machine detects any safety defects, these must be addressed immediately.

All Väderstad machines have passed quality assurance inspections and operational tests prior to delivery. However, the user/owner shall bear full responsibility for the machine functioning correctly when in use in the field. In the event of a complaint, please refer to the “General delivery provisions for the Väderstad Group”.

Design modifications form a part of the continual improvement of our machines. Descriptions of the machine therefore refer to the form and design of the machine at the time of writing. The user manual may contain images that show a machine that does not look exactly like the one you have received, depending on which optional additions have been fitted, the model, or whether any updates have been carried out. Some descriptions in these instructions may not be relevant to your machine.

The operating instructions are designed according to the guidelines of the ISO 3600 standard.

1.2 Before using the machine

A. Carefully read through these instructions and ensure that you have understood their content.
B. Learn to use the machine correctly and carefully! In the wrong hands or if carelessly operated, the machine can become a dangerous implement.
C. The machine will form a part of your workplace and the workplace of your colleagues. It is therefore important to ensure that everyone is protected and that functioning safeguards are in place.

1.3 How to read these instructions

Letters within brackets refer to corresponding letters in the image and are used as a reference in a text.

A. Reference (A)
B. Reference (B)

Information for which the order is important is indicated using numbered action instructions.

When referring to images, figures are also used in the same way as the alphabetical list if the references outnumber the letters in the alphabet.

1. Start by...
2. Then ...

1.4 Description of Safety Symbols

Danger is used to indicate an imminently hazardous situation which, if not avoided, will result in death or serious injury.

Warning is used to indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.

Caution is used to indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. However, such distinctions can be too subtle to affect behaviour (or to be translated). In certain circumstances, signal phrases such as "DANGER OF DEATH", "RISK OF BLINDING", or "BEWARE OF FUMES" can be more effective at drawing greater attention to some instructions or safety information than signal words.

Information marked with this symbol may be worth noting as it relates to a useful tip or a particularly useful piece of information that will help you handle the machine properly.

Used to clarify information.

- Used to present information in the form of bullet points. The order in which the information is set out is not indicative of any particular order of precedence which must be followed.

2 Product description

2.1 Väderstad E-Services

All machine functions are controlled and monitored from the tractor cab using a control unit.

Väderstad offers two different alternatives for controlling and monitoring the machine. All of these systems can control all of the machine's functions, but there are variations in the way the systems are operated and connected up. This manual only describes E-Control and ISOBUS.

2.2 Overview

E-Control/ISOBUS

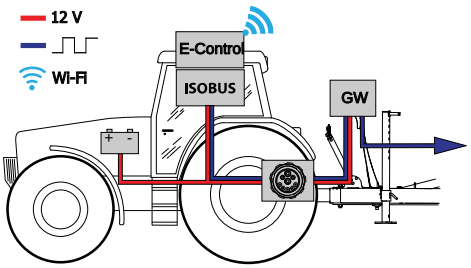

Figure 2.1

- E-Control – controlling and monitoring the machine with an iPad.
- ISOBUS – controlling and monitoring the machine using VT.
- GW (Gateway) – control unit that processes and stores machine data

2.3 Gateway

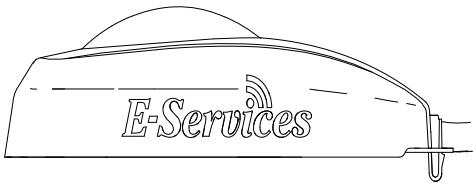

Figure 2.2

Gateway is the brain of the E-Control and ISOBUS systems. It communicates with the iPad and/or VT (Virtual Terminal) and stores all of the machine's settings and important data related to its functions, alarms, etc. Every seed drill has its own Gateway.

Gateway is compatible with ISO 11783 and requires an ISOBUS terminal (Virtual Terminal) running version 3 or 4. Väderstad AB's website contains a list of tested terminals; visit *www.vaderstad.com* for more information.

2.4 E-Control (iPad)

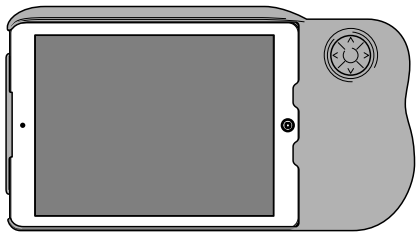

Figure 2.3

E-Control consists of an iPad[1] that can be combined with a special docking unit, called the E-Keeper. The communication between the iPad and the machine's Gateway takes place wirelessly via a Wi-Fi connection. Gateway receives and processes all commands. E-Control has a large touchscreen with coloured menus that make it easy to operate. The E-keeper features a number of buttons that are used to control and navigate the most important functions while driving in the field.

2.5 Software

Väderstad has an application, E-Control, which is a program that can be used to control your Väderstad machine from an iPad. The application is installed on the iPad delivered with the machine (does not apply for all countries) and comes with the necessary settings for network connection pre-installed at the factory.

Open the Väderstad application using the icon for E-Control . The terminal imports the software from the machine's Gateway and all important data on machine functions, alarms, etc. are presented in a clear and easy-to-read way on the screen.

- The terminal will determine the appearance and function of submenus in the form of e.g. keyboards and scroll bars. Please read the terminal's user guide for information on operation.

2.6 E-Keeper

An iPad holder is available as an accessory for the touchscreen. The e-keeper offers a firm grip for the user and there are a number of easily accessible buttons to control the functions that are most frequently used while driving.

1. iPad is a registered trademark of Apple Inc.

2.6.1 Button functions

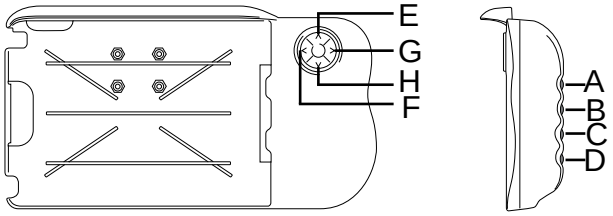

Figure 2.4

A. **Variable adjustable seed feed rate**: hold down the A button and move UP/DOWN using the E and H buttons.

   Activate or deactivate row units from left: hold down button A and press F.

   Activate or deactivate row units from right: hold down button A and press G.

B. **Variable adjustable fertiliser feed rate**: hold down the B button and move UP/DOWN using the E and H buttons.

C. Alarms menu (displayed as long as the button is held down).

D. Statistics menu (displayed as long as the button is held down).

   A maximum of 12 row units may be displayed at a time. If there are more than 12 row units, move RIGHT/LEFT using the F and G buttons while holding down the D button

E. Lift stop (OFF/ON).

F. Not used.

G. Bout marker switching. Switches manually or automatically depending on selection with the function button  .

H. Manual feed.

3 Assembly instructions

3.1 Mount E-keeper in the tractor

Be sure to check for any concealed wiring prior to any drilling in the tractor cab.

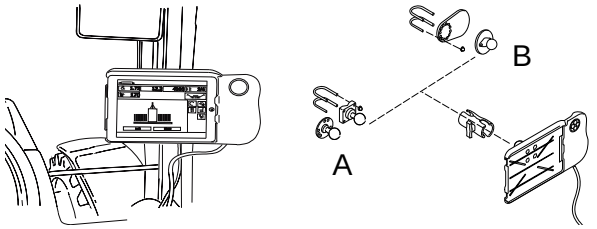

Figure 3.1

1. Mount the holder securely in the tractor cab. The holder should be located within the field of vision when driving forwards. Choose between a regular bracket (A) or a bracket with a magnetic foot (B). Mount the bracket as shown in the illustration.
2. Connect the holder's power cable to the tractor's 12 V socket.

3.2 Fit the iPad in the E-Keeper

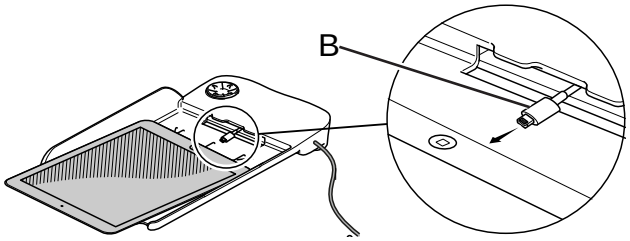

Figure 3.2

Connect the iPad to the charger cable (B) and push it all the way into the E-Keeper. Push it gently into place.

There is wireless communication between the iPad and the E-Keeper. If the buttons on the dock do not work, check that Bluetooth is enabled in the iPad settings menu.

3.3 Connect to ISOBUS

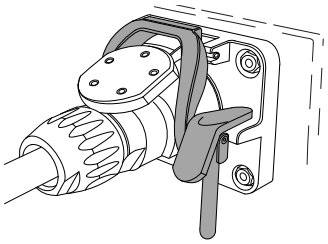

Figure 3.3

1. Connect the cable from Gateway to the tractor's ISOBUS connector. Take care when making the connection to and make sure that the connectors mount correct and lock to avoid breaking the components.
2. Make sure that the pins of both connectors are aligned.
3. Attach the connector with the latch clamp. (The appearance my differ depending on the tractor.) The terminal detects that a Gateway is connected and automatically imports the software.
4. Hang the cable in the hose holder together with the hydraulic hoses.

3.4 Connect to tractors without ISOBUS connectors

Connect the red cable to 12 V **AFTER** connecting the main switch/main relay.

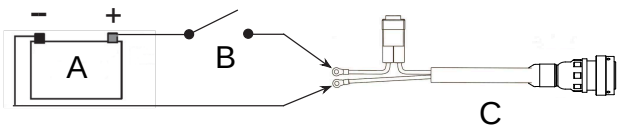

Figure 3.4

A. Tractor battery
B. Tractor main switch
C. Power supply to Gateway

1. Make sure that the main power switch in the tractor is switched off.
2. Fit the electrical socket in a suitable place with the cable pointing downwards in order to prevent water from getting into the connector. We recommend that the socket be located close to the hydraulic connector at the rear of the tractor.

3. Route the cable in a suitable way through to the main switch/main relay switch. The cable must be fitted so that it cannot get trapped, work loose or risk coming into contact with hot components on the tractor.
4. Connect the black cable to minus and the red cable to plus.

3.5 Pair the iPad with the E-Keeper

In order for an iPad to work with an E-Keeper, they must be paired. If the iPad is used with another E-Keeper or the E-Keeper is replaced, they will need to be re-paired.

Pairing an iPad with an E-Keeper

1. Power up the E-Keeper.
2. Ensure that the iPad and E-Keeper are within “Bluetooth” range and launch the E-Control application on the iPad. If “Bluetooth” is not enabled, you will be prompted to enable it on the screen.
3. Press any button on the E-Keeper. The “Bluetooth” symbol will light up and the E-Keeper will be ready to use.

The iPad must always be unpaired from the E-Keeper before it is paired with a new one.

Unpairing an iPad from an E-Keeper

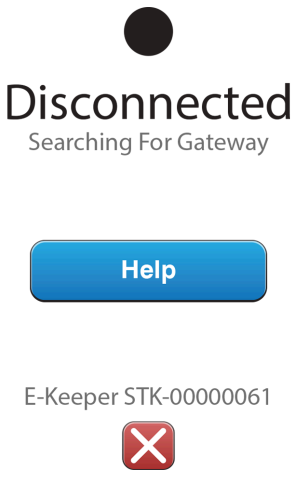

Figure 3.5

1. Start the iPad.
2. Select settings and switch off the Wi-Fi.
3. Start the E-Control application. A page will be displayed, asking if you want to unpair the iPad from the E-Keeper.
4. Press the cross, see *“Figure 3.5 “*. The “Bluetooth” symbol will go out and it will now be possible to pair the iPad with another E-Keeper.
5. Select settings and re-start the Wi-Fi.

4 Get started

4.1 Connect with E-Control

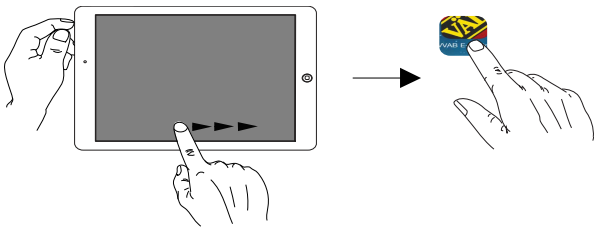

Figure 4.1

iOS 10.2 or a newer version is required in order to use E-Control.

If it has not been installed already, the E-Control app must be downloaded as per *"4.2 Download the E-Control application, ISOBUS/E-Control"*.

1. Connect Gateway to the ISOBUS connector or other power supply on the tractor.

   Gateway must ALWAYS be supplied with power when the machine is in operation.

2. Start the iPad in the tractor cab or close to Gateway. Connection to the Gateway network takes place automatically.

3. Open the E-Control application by pressing the symbol.
   - It can take up to two minutes for the application to open.

4. The machine's home screen is displayed when the download is complete.

Always check before starting work that the iPad is connected to the correct network. Once the local network from Gateway is enabled for the first time, the iPad will automatically find the network the next time you are within range. However, if you have already connected to another network, the network must be selected manually.

4.1.1 If the network is not found automatically

If connection to the network does not take place automatically, the network connection must be enabled. This might happen if, for example, you have already connected to another network or you are using an iPad that has not been connected to the network from Gateway before (network unknown).

1. Start the iPad in the tractor cab or close to Gateway.
2. Select network settings and enable Wi-Fi. (Please read the user manual for the iPad or contact Apple support for instructions about how to select the network and enable Wi-Fi.)
3. The local network from Gateway will be shown under network selection. The network name is "machine type"-[Gateway serial number], e.g. TP-VAD-000125.
   - If the network is not shown immediately, wait for a minute or so while the iPad searches for networks. If the network cannot be found after several minutes, despite correct power supply, contact a service technician.
4. Press the network name and enter the password for the network. The password is 12345678.
5. The network name is shown in the Wi-Fi field and a check mark icon shows that the connection is enabled.
6. Exit network settings by pressing the iPad home button.
7. Open E-Control using the icon.

4.2 Download the E-Control application, ISOBUS/E-Control

Väderstad's E-Control application is free software that can be downloaded to an iPad from the App Store (Apple and the App Store are registered trademarks of Apple Inc.).

An Apple ID is required to download applications from the App Store. The same Apple ID can be used for several Apple products. If you already have an Apple ID, then you can use this to download the E-Control application.

Please read the iPad user guide or contact Apple Support for detailed instructions on how to create an Apple ID.

1. Connect the iPad to a wireless network with Internet connection. Please note that the network which Gateway transmits is NOT connected to the Internet.
2. Go to the iPad home screen and press the App Store icon.
3. Press the search field and type in "E-Control", then start the search.
4. The Väderstad icon will appear on the screen.

5. Press the “free” field and then “Install app.” Enter your Apple ID if it is requested. The download status bar in the icon indicates that a download is in progress.
6. Press “open” to start the Application.

The application is the same for all Väderstad machines equipped with E-Control. The system automatically detects the relevant machine type.

4.3 Updating software in Gateway, ISOBUS/E-Control

iOS 16 or a newer version is required in order to use E-Control.

The application is common to all machine models. The search provides updates for all machine models to which E-Control has been connected. During the installation phase, Gateway detects which update is relevant for that particular device.

Software is updated by first downloading the new software to your iPad from the Internet. When the iPad then connects to the local network from Gateway, you are asked whether the new software should be installed.

1. Connect the iPad to a wireless network with Internet connection. Please note that the network which Gateway transmits is NOT connected to the Internet.

   If the network is not shown immediately, wait for a minute or so while the iPad searches for networks.

2. Go to the iPad dashboard and press the VÄD icon.

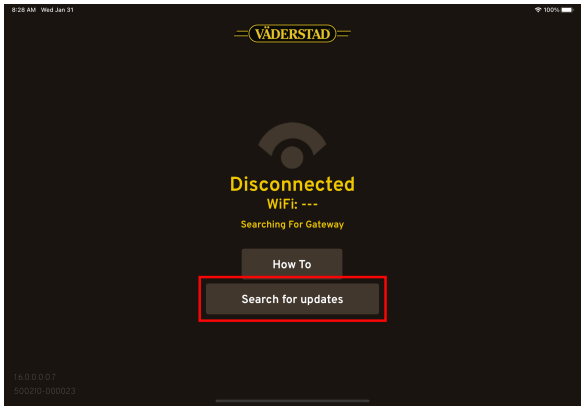

Figure 4.2

3. Select “Search for updates” when prompted.

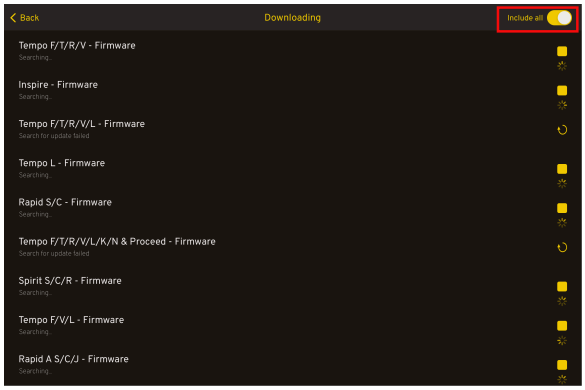

Figure 4.3

4. You will see on screen which updates are available, and the download will start.

   The search provides updates for all machine models to which the E-Control unit has been connected to before.

   If your machine is not in the list, you can toggle "Include All" to search for all machine updates, in the top right corner.

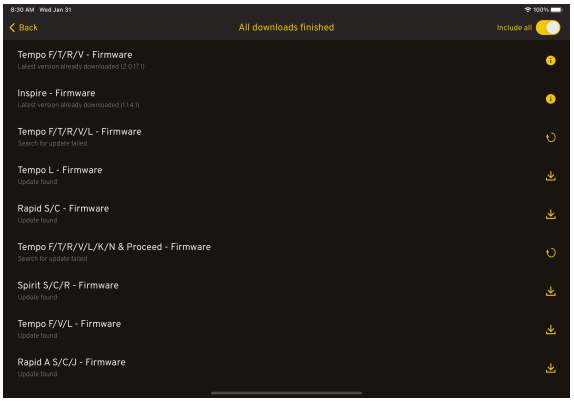

Figure 4.4

5. To download, press the icon on the right-hand end of each row.

Figure 4.5

6. A pop-up window will be shown with Release Notes about new features since last update. Press “Download”.
7. A progress bar will show up, when it is finished the new update is saved on the iPad. Once installation is complete, the message “Update successful” appears.
8. Change the wifi connection to the machine again.

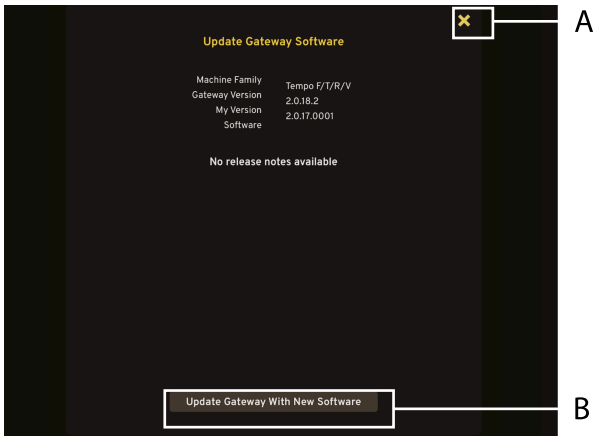

Figure 4.6

9. If you have an older version on your machine you will see a window like this .

   Press "Update Gateway With New Software" (B) if you want to update. If you want to wait press the X (A).
10. The gateway will now update, this may take about 5 minutes. If it is not done by then. Check your wifi connection and make sure it is the machine. If it is connected to the machine, try to close the app manually.

5 Home screen

The home screen displays all information that is required when monitoring and adjustment of settings. The home screen is displayed while operating.

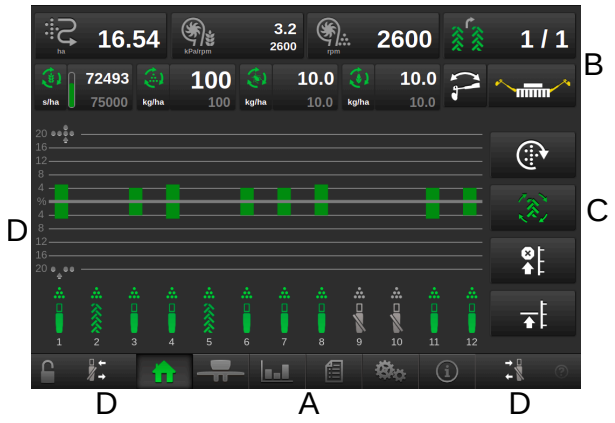

Figure 5.1

A. Navigation buttons.

   See chapter.*"5.1"*.

B. Display for control and monitoring.

   See chapter*"5.2"*.

C. Function buttons.

   See chapter*"5.3"*.

D. Row units.

   See section *"5.4"*.

The padlock in the lower left-hand corner indicates whether master status is obtained. A grey padlock indicates that master status has been obtained, while a red padlock indicates that the terminal is in slave mode. A request to switch to master status can be made by clicking on the red padlock.

5.1 Navigation buttons

Field A on the home screen. See figure

Home screen. This button always takes you back to the home screen. See section *"5 Home screen"*.

Operational settings. This is where the settings are entered for hydraulic row unit pressure. (If the machine is equipped with hydraulic row unit pressure and the function is activated). This is also where machines with liquid fertiliser controls its different modes. See section *"8 Operational settings"*.

Statistics. Shows statistics of the machine's operation as well as drilling performance for the current drilling operation. See section *"9 Statistics"*.

Alarms. Press the button to access the alarms menu. The alarms menu shows a detailed description of the nature of the alarm; alarms can also be acknowledged here. The digit in the top left corner shows the number of activated alarms. See section*"10 Alarms"* .

General settings, calibration and configuration. These settings can only be accessed, for safety reasons, when the machine is stationary. With exception for machine calibration, that includes the radar calibration, and is done while the machine is in motion. No settings can be adjusted here during operation. See section *"6 General settings"*.

Information. Displays information on software versions and status of GW, PDB and WorkStations (WSX). Detailed information for individual row units and various product motors can also be found here. See section *"11 Information"*.

By pressing on the field for the seed application rate, you can adjust the application rate directly on the home screen. Row units can be switched OFF/ON by pressing on a row unit.

5.2 Display for control and monitoring

If the front tank is used, verify that the correct fan is used (see *"6.4 Machine settings"*) to ensure a correct value in *"Figure 5.2 "*, fan rpm fertiliser.

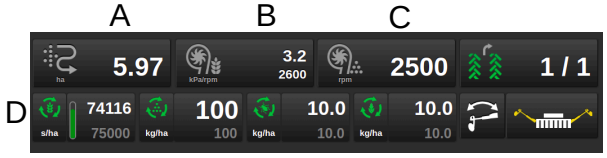

Figure 5.2

Figure 5.3

Press A, B or C to access the menu, see *"Figure 5.2 "*.

Information is displayed in the dropdown menu:

A. Fan rotation speed and air pressure, seed
B. Fan rotation speed, fertiliser
C. Operation speed
D. System air pressure. Only selectable for TPL and TPK machines with system pressure sensor
E. Fan rotation speed and air pressure, Central Fill
F. Area sowed. Shows area sowed since last reset on statistic page daily
G. Fan rotation speed, BioDrill
H. Mean seed quality. Only selectable for TPK machines
I. Air pressure, liquid fertiliser
J. Pump rotation speed, liquid fertiliser
K. Tank level, liquid fertiliser
L. Mean ground contact. Shows average ground contact on all rows since the last reset on statistic page daily. Only selectable for machines with individual hydraulic row unit downforce.

Check at regular intervals, during operation, that the air pressure in the seed feed housing is maintained at 3.5 kPa

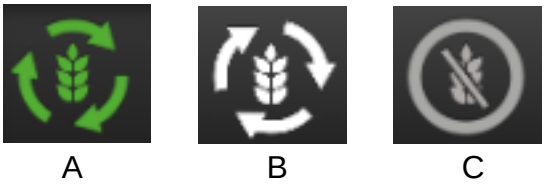

Figure 5.4

Tap on any of the icons on row D; see *"Figure 5.2 "* to switch each individual product on and off (seed, fertiliser, Microgranulate, BioDrill)

A. Product (Seed) active, green icon
B. Product (Seed) inactive, white icon
C. Product (Seed) switched off, grey, icon

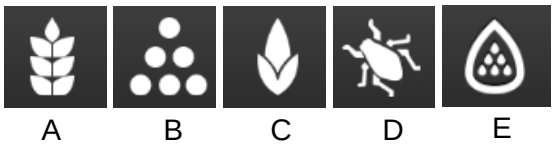

Figure 5.5

A. Seed
B. Fertiliser
C. BioDrill
D. Microgranulate
E. Liquid fertiliser

If you press on the value next to any of the icons on row D, this opens a menu to reset the sown amount for each respective product.

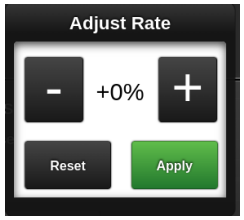

Figure 5.6

5.3 Function buttons

Field C on the home screen. See figure*"Figure 5.1 "*.

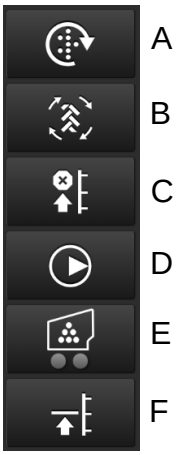

Figure 5.7

A. Manual feed
B. Auto advance, tramlining (TPE, TPR, TPT, TPV, TPK)
C. Lift stop with marker (TPF, TPL
D. Shut-off of liquid fertiliser pump control for TPL. Normally switched off and white. Lights up green when pump is switched on. Grey pump when control is switched off.

E. Activation of front tank. There are two indicator lights at the bottom of the button that turn green when the left or right motors are on (only for machines with front tank).
F. Low left (TPF, TPL)

See also *"13 Use in the field"* for a more detailed description of the functions.

5.4 Row units

Field D on the home screen. See figure *"Figure 5.1 "*

A bar chart is displayed for each row unit that monitors the output. Also displayed are status indication and a row unit number.

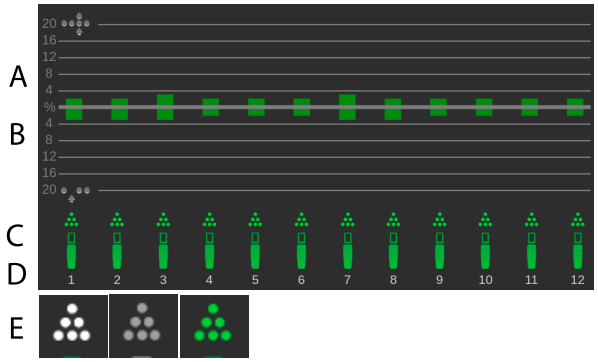

Figure 5.8

A. The number of doubles – The bar indicates the row unit's number of doubles as a percentage.
B. The number of skips – The bar indicates the row unit's number of skips as a percentage.
C. Row unit status
D. Row unit number
E. Row fertiliser status.
   - Fertiliser inactive for this row unit
   - Fertiliser on for this row unit
   - Fertiliser off for this row unit

It is possible to switch the output on/off for an individual row unit directly on the screen by pressing on the row unit to be changed. Restart the output by pressing the same row unit again. It is also possible to stop and start the output from either the right or the left by using the (E) buttons.

When you raise and lower the machine during operation at a speed in excess of 2 km/h, all row units always start automatically.

Bar colours

Drilling quality refers here to the amount of skips or doubles, or to the value of the deviation from the specified feed rate when the machine is equipped with a seed disc with more than 70 holes.

- Green bar = drilling quality within approved bounds.
- Yellow bar = drilling quality is not within approved bounds. 50% of the set alarm level has been reached.
- Red bar = drilling quality is not within approved bounds. 100% of the set alarm level has been reached.

The levels for the different alarms are set in the alarms menu in general settings.

Row unit symbols colour

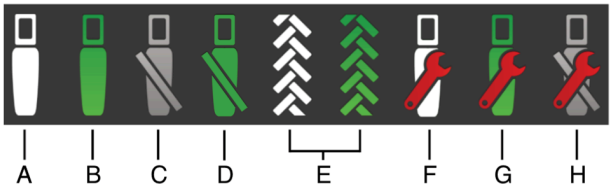

Figure 5.9

A. The row is OK and is not feeding out. The row is not in drilling position.
B. The row is OK and is feeding out. The row is in drilling position.
C. The row is switched off.
D. The row is about to be shut down.
E. The row is switched off because of tramlining. A green colour is displayed when the machine is in drilling position.
F. If a red spanner is displayed, this indicates that there is an alarm on the row. There is a fault which needs to be inspected and remedied. There is no feed from the row.
G. If a red spanner is displayed, this indicates that there is an alarm on the row. There is a fault which needs to be inspected and remedied. The row is attempting to feed out.
H. If a red spanner is displayed, this indicates that there is an alarm on the row. There is a fault which needs to be inspected and remedied. The row is switched off.

5.5 Low power mode

When the generator does not receive enough power to the system, motors and other functionality that requires power will be shut down. A warning box will appear on the home screen warning that the machine is in low power mode. To exit low power mode, make sure that the generator is delivering full power.

A possible reason why the system goes into low power mode can be that the fan is switched off. Check that the fan is running at a normal speed to avoid going into low power mode.

6 General settings

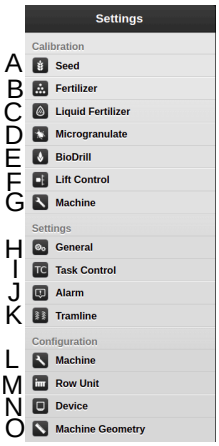

Figure 6.1

A. Calibration of seed amount, refer to *"7.1 Calibration of seed"*.
B. Calibration of fertiliser, refer to *"7.2 Calibration of fertiliser"*.
C. Calibration of liquid fertiliser, refer to *"7.3 Calibration of liquid fertiliser"*.
D. Calibration of micro-granulate, refer to *"7.4 Calibration of microgranulate"*.
E. Calibration of BioDrill, refer to *"7.5 Calibration of BioDrill"*.
F. Lift control *"7.7 Checking lift and output levels"*.
G. Machine, refer to *"7.6 Calibration of machine and radar"*.
H. General machine settings, refer to *"6.1 General machine settings"*.
I. Task control, refer to *"7.8 Task Control"*.
J. Alarm levels, refer to *"6.2 Alarm levels"*.
K. Tramlining, refer to *"6.3 Tramlining"*.
L. Machine settnings *"6.4 Machine settings"*.
M. Row unit, refer to *"5.4 Row units"*.
N. Device settings, refer to *"6.5 Row unit settings"*.
O. Machine geometry settings, refer to *"6.4 Machine settings"*.

6.1 General machine settings

Under General machine settings, the user can switch the products and functions that the machine is equipped with on or off. The user can also set sensor sources, machine data, various adjustment steps, language and unit to optimise the user interface.

Each machine is preconfigured at the factory with the correct type and size etc.

Replacing the Gateway unit that contains the machine's memory, requires resetting the machine's default settings.

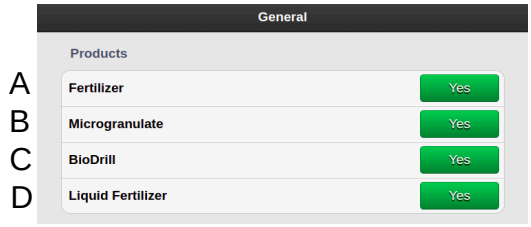

Figure 6.2

A. Liquid fertiliser YES/NO
B. Microgranulate ON/OFF
C. BioDrill ON/OFF
D. Liquid fertiliser

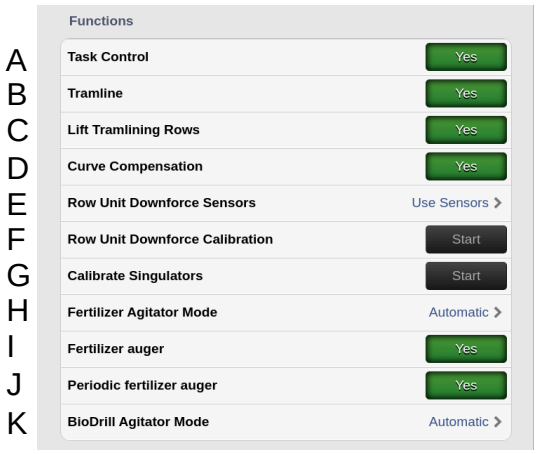

Figure 6.3

A. Task Control ON/OFF. While Task Control is enabled/disabled, a countdown will be displayed in place of ON/OFF.
B. Tramline YES/ NO
C. Lift Tramlining Rows
D. Curve Compensation
E. Row unit Downforce Sensors
F. Row unit Downforce Callibration
G. Calibrate Singulators
H. Fertiliser Auger Mode
I. Fertiliser Auger
J. Periodic Fertiliser Agitator
K. Agitator BioDrill Mode

   ON: Electric motor/ hydraulic valve is always running/open

   OFF: Electric motor/ hydraulic valve is never running/open

   AUTOMATIC: Electric motor/hydraulic valve running/open when any of the BioDrill motors are running.

Figure 6.4

Sensor source

A. Speed source
   - Radar on the machine or via ISO11786 connector
   - Ground speed (No Slip) via ISO11783 connector. [2]
   - Wheel-based speed (Slip) via ISO11783 connector. [2][3]

B. Height source
   - Machine sensors (TPR, TPT, TPV only)
   - The height of the 3-point linkage via ISO11786 connector [4]
   - The height of the 3-point bracket via ISO11783 connector. [5]

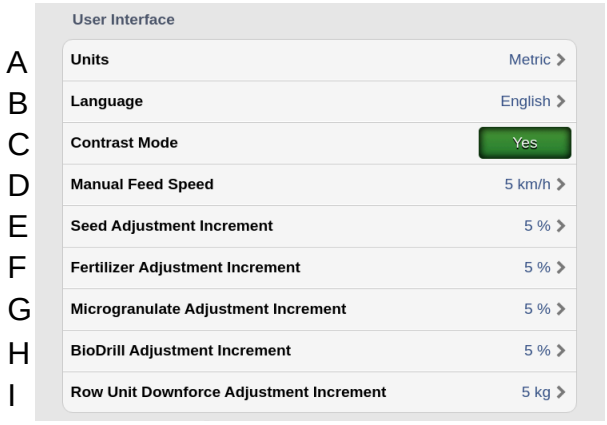

Figure 6.5

User interface

A. Units. Metric or imperial.
B. Choice of language. Language settings are normally selected in the menu for the control unit.[6]. If the desired language for the control unit is not displayed, the language can be selected in this menu [7]
C. Contrast mode YES/NO
D. Manual Feed Speed
E. Seed output percentage, is adjusted by pressing the +/- buttons on the home screen.
F. Fertiliser output percentage is adjusted by pressing the +/- buttons on the home screen.
G. Microgranulate output percentage is adjusted by pressing the +/- buttons on the home screen.
H. BioDrill output percentage is adjusted by pressing the +/- buttons on the home screen.
I. Liquid fertiliser output percentage is adjusted by pressing the +/- buttons on the home screen.

Figure 6.6

Machine data, configuration

A. Free text field for naming the machine
B. The machine's serial number.
C. Advanced settings YES/NO

6.2 Alarm levels

Alarm settings

Set the level to the alarms that are to be activated. To reset an alarm, press on the field required and set a new alarm level in the pop-up window.

The Alarm delay indicates the time-lapse between an error signal from the sensor, and the visual/audible alarm on the home screen. The alarm indication should be slightly delayed to avoid alarms at low driving speeds.

All alarms on the machine have a level to define when the alarm will be active. Some alarms also have a delay to define how long the value will be at this level before the alarm is displayed as active. To be specific, the time delay defines the time from when a sensor detects the error to when it is visually displayed on the screen. The delay is necessary to avoid alarms at low driving speed. However, the delay must be as short as possible so that even sudden brief interruptions can be detected.

To change the delay or level for an alarm, press the field and enter anew valid delay or level in the field.

2. Note that when selecting a speed from ISO11783, the tractor's terminal needs to be able to support the selected speed source.
3. Note that wheel-based speed can lead to reduced accuracy, depending on the amount of slippage that the tractor experiences when drilling.
4. Note that when selecting a height source from ISO11786/11783 connector, it is a requirement that the tractor is able to support this. Only selectable on TPR, TPT and TPV.
5. Note that when selecting a height source from ISO11786/11783 connectors, the tractor needs to be able to support this. Only selectable on TPR, TPT and TPV.
6. Please read the user guide for the control unit to find out how to select the language settings.
7. Väderstad reserves the right to decide which languages will be available.

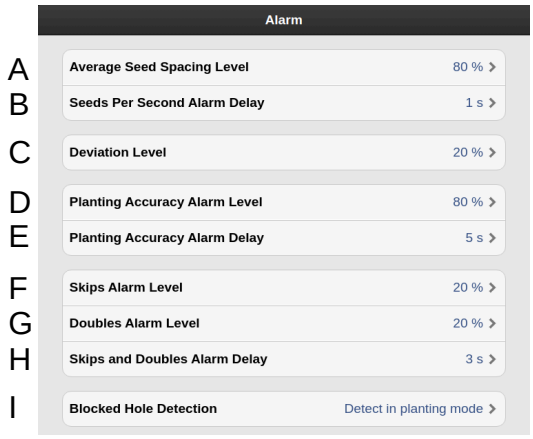

Figure 6.7

A. Alarm level for percentage deviation in the spacing between seeds on average for all row units.
B. Alarm delay (secs) for seeds per second.
C. Deviation level. Alarm level for deviating sow amount (seed/ha) at quantity output.
D. Planting accuracy alarm level. Generates an alarm if the planting accuracy for one of the row units is less than the set alarm level.
E. Alarm delay (sec) for planting accuracy. Basic setting: 5 seconds.
F. Alarm level for the number of skips within each row. Default setting: 20%
G. Alarm level for the number of doubles within each row. Default setting: 20%
H. Alarm delay (sec) for the number of skips and doubles.
I. Detection of a blocked hole. Select whether blocked holes should be detected in planting mode, in planting mode and seeding mode, or not detected at all

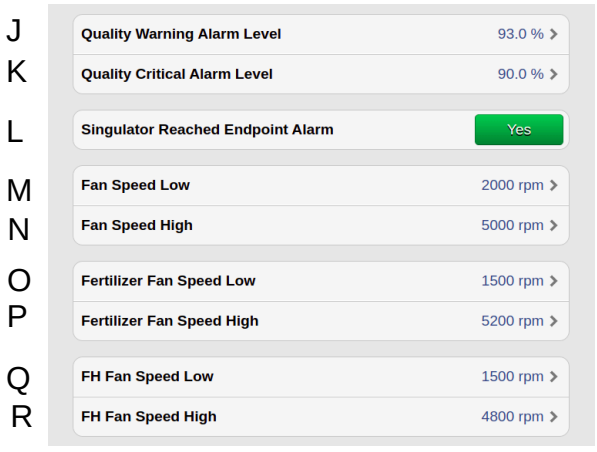

Figure 6.8

J. "Warning" alarm level for drilling quality. Drilling quality is the deviation percentage for skips and doubles together. Displayed as a bar chart on the statistics page (yellow marking if the accuracy is less than the set alarm level)
K. "Critical" alarm level for drilling quality. Drilling quality is the deviation percentage for skips and doubles together. Displayed as a bar chart on the statistics page (red marking if the accuracy is less than the set alarm level).
L. Singulator has reached end position. Select YES if the user wants an alarm to signal when the singulator reaches the end position
M. Fan rotation speed alarm level, lower alarm level. Default setting: 2,000 rpm.
N. Fan rotation speed alarm level, upper alarm level. Default setting: 5,000 rpm.
O. Alarm level for fan speed, fertiliser, lower alarm level. Basic setting: 1500 rpm.
P. Alarm level for fan rotation, fertiliser, upper alarm level. Basic setting 5200 rpm.
Q. Fan speed alarm level, FrontHopper 2200, lower alarm level. Basic setting: 1500 rpm.
R. Fan speed alarm level, FrontHopper 2200, upper alarm level. Basic setting: 4800 rpm.

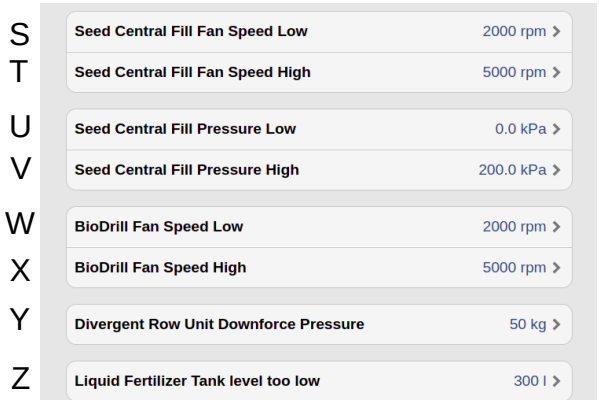

Figure 6.9

S. Fan speed alarm level, Central Fill, lower alarm level. Basic setting: 2000 rpm.
T. Fan speed alarm level, Central Fill, upper alarm level. Basic setting: 5000 rpm.
U. System pressure alarm level, Central Fill, lower alarm level. Basic setting: 0 kPa.
V. System pressure alarm level, Central Fill, upper alarm level. Basic setting: 200 kPa.
W. Fan speed alarm level, BioDrill, upper alarm level. Basic setting: 5000 rpm.
X. Fan speed alarm level, BioDrill, upper alarm level. Basic setting: 5000 rpm.
Y. Deviating row unit pressure. Emits an alarm when the row unit pressure deviates by the indicated number of kg.
Z. Alarm level for low tank level, liquid fertiliser. Default setting: 300L .

6.3 Tramlining

6.3.1 Calculation of tramlining

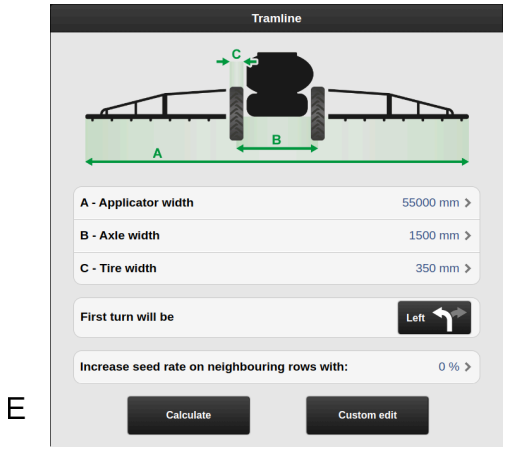

Figure 6.10

The Tramline screen is intended for the calculation of tramlining. A suggested calculation can be chosen based on the settings entered. It is also possible to design a specific tramline program.

The background is displayed in a light colour when in display mode. When doing design/changes the screen background changes to a dark colour. This is to help the user identify which mode that is in use.

Values to be entered

A. Total width of the spraying implement.
B. Distance between the pair of wheels.
C. Width of the wheels (safe clearance of the plants can be achieved by entering a higher value here. Example: the wheel width is 500 mm, but additional protection of 50 mm for the plant is desired – so 600 mm should be entered)
D. Also indicate which direction the tractor will turn after the first bout.

Buttons for selecting calculations

E. The calculation is based on the information entered.
F. Facilitates your own, customised tramlining.

To simplify the process of setting up a tramline program, it is advisable to select a suggested tramline as a basis for your own. Please note that such a tramline program will only provide a suggestion, it is important to check the suitability.

The suggested tramline has no upper limit for the number of bouts. The maximum number of bouts that can be generated is 120. If the suggestion is not suitable, it can be adjusted by modifying the wheel width and generating a new tramline. Alternatively, adapt the tramline described below to create your own.

6.3.2 Calculated tramline

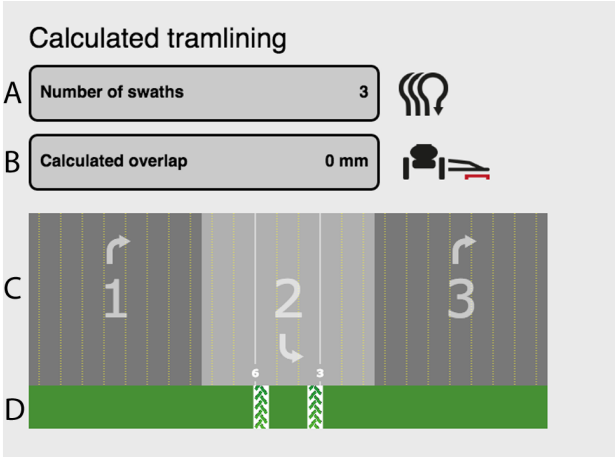

Figure 6.11

A. Total number of bouts in the tramline program
B. Overlap for the spraying implement
C. Bouts for the drill
D. Bouts for the spraying implement

The yellow dotted lines (C) display the row units that sow and the white solid lines display the row units that will be shut off due to the tramlining.

The example in the above illustration displays that row units 3 and 6 will be shutdown because of the tramline in bout number 2 in the tramline program.

You can scroll left and right in order to see the entire calculated sequence.

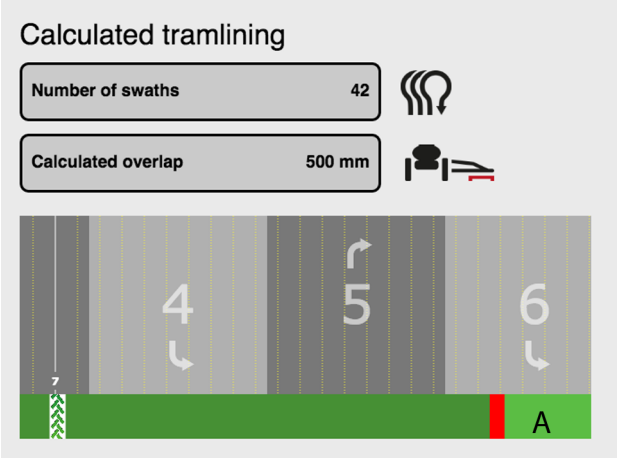

Figure 6.12

A. Indicates the overlap made by the spraying implement between each bout.

The overlap occurs if the working widths of the drill and the spraying implement do not run equally.

6.3.3 Customised tramlining

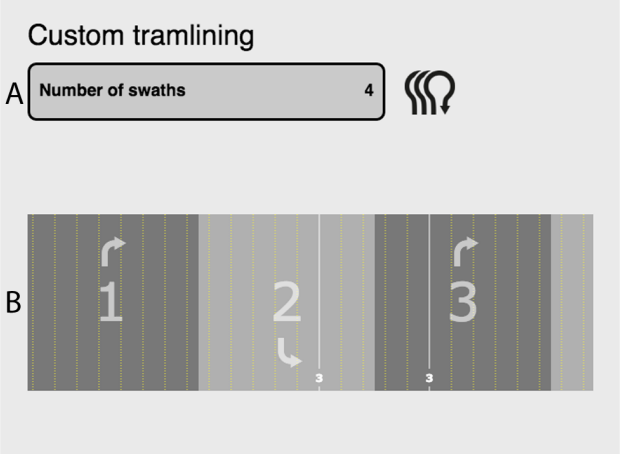

Figure 6.13

The screen above displays customised tramlining:

A. Number of bouts
B. Bouts. Displays whether the row unit will sow or tramline.

The yellow dotted lines in (B) display the row units that will sow and the white solid lines display the row units that will shutdown because of the tramlining.

The above example displays that row unit 3 will be shutdown during bouts 2 and 3 because of the tramlining.

6.3.4 Changing a suggested tramline

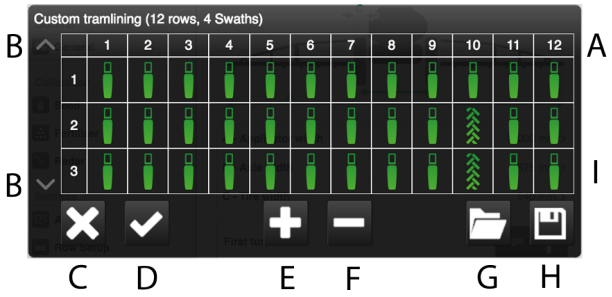

Figure 6.14

Changes to the tramline program can be made by shutting off one or more row units in bouts where tramlining tracks are to be laid.

A. Row units
B. Arrows used to scroll through the various bouts of the tramline program.
C. Cancel
D. Accept
E. Add a bout to the tramline program
F. Remove a bout from the tramline program.
G. Open a saved tramlining program.
H. Save the current tramlining program.
I. Displays whether the row unit will be sowing or turned off for each bout.

To change a suggestion / create a tramline:

- Select which row unit(s) is/are to be shut off during tramlining by pressing on the row unit(s). When marking the row unit, it switches between tramlining (wheel tracks) or normal sowing.
- Press (E) for additional bouts and (F) to reduce the number of bouts.
- Confirm the change by pressing (D) To undo changes, press (C).

For successful tramlining, it is very important to think through where they are going to be before starting work.

6.3.5 Save the tramline program

It is possible to save up to 10 tramline programs.

Press (H) in the previous tramline selection screen.

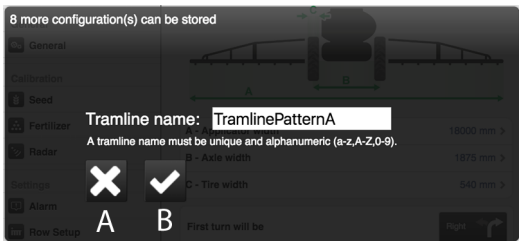

Figure 6.15

Name the tramline program to be saved and press (B).

Press (A) to cancel.

6.3.6 Open a tramline program

Press (G) in the previous tramlining selection screen

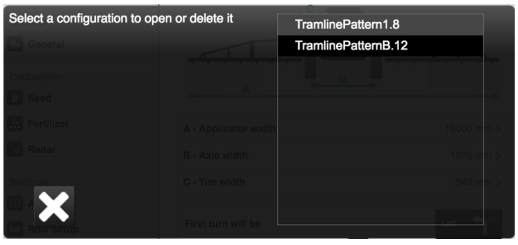

Figure 6.16 Name a tramline program

The available tramline programs are displayed here. The final figure indicates the number of rows on the machine that the program is intended for. The number is automatically appended to the name when the program is saved. It is important that the program chosen is consistent with the current number of rows on the machine to be used.

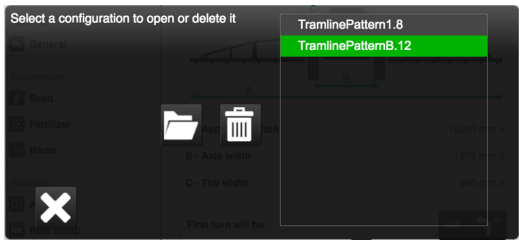

Figure 6.17

If the selected program agrees with the configured settings of the machine and its number of row units, then it will be highlighted in green.

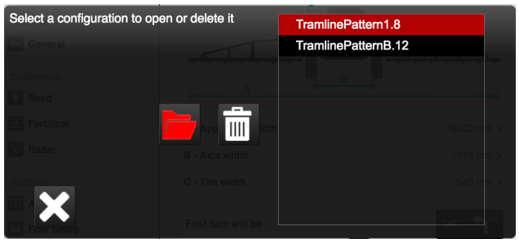

Figure 6.18

If the selected program does not agree with the configured settings of the machine, then it will be highlighted in red.

To open the selected program, press  .

To delete a saved program, press 

6.3.7 Tramlining compensation

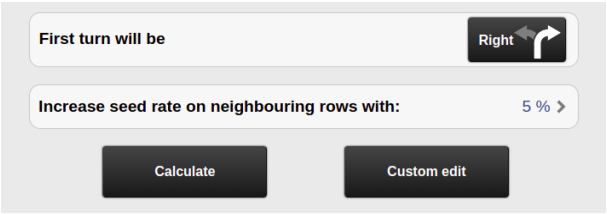

Figure 6.19

Tramlining compensation is a function that allows you to vary the feed rate using the tramline program. By entering a percentage in (A), all rows adjacent to a tramlining row will receive an increased feed rate, in accordance with the percentage entered.

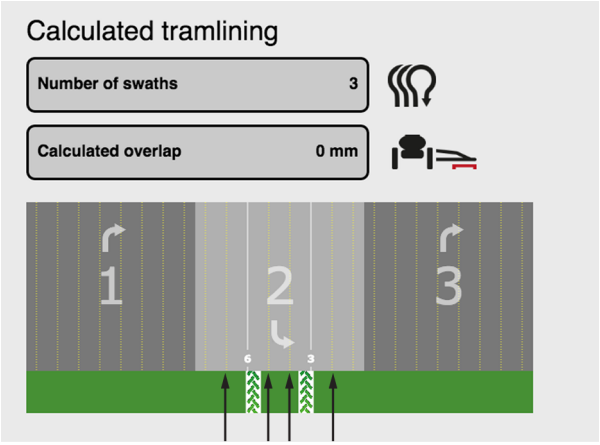

Figure 6.20

In the figure above, the arrows indicate, which rows will be compensated.

6.4 Machine settings

If a machine configuration needs to be done, keep in mind that an invalid machine configuration can damage the machine.

If the machine is equipped with Widelining, this has to be marked. The output will then not be switched off for the row units that indicate tramlining and the row units move laterally instead.

Machine settings display machine-specific settings, e.g. machine type, size, and which products and functions are that the machine supports. To access Machine settings activate “Advanced settings” in general settings; see *“Figure 6.6 “*.

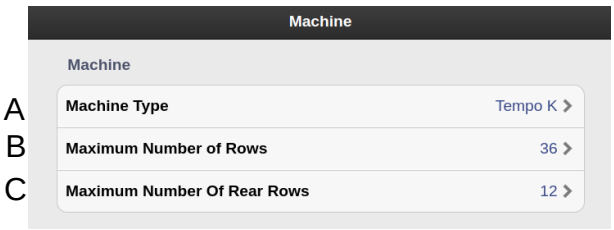

Figure 6.21 Machine settings

Machine product

A. Select machine type.
B. Maximum number of rows. The number of rows the machine is built for.
C. Maximum Number of Rear Rows: Only selectable/ visible for TPK machines. Defines the maximum number of rows positioned with a given offset behind the front rows. This is important for the correct presentation and calculation when using Task Control.

D. Wingspan (TPL and TPV only).

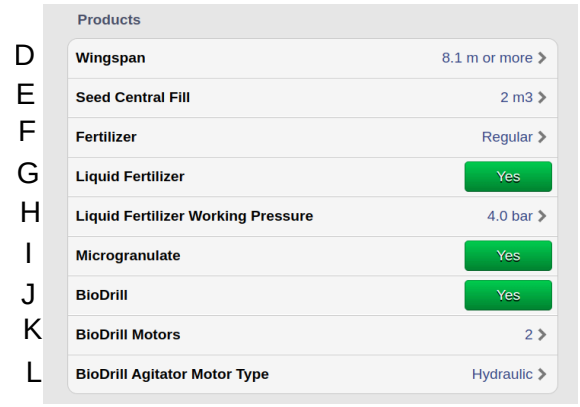

Figure 6.22 Machine settings products

- For TPL machines the choices are “7.2 m or less or “8.1 m and more”
- For TPV machines the choices are “6.0 m or less or “6.5 m and more”

E. Central Fill (NO/2m³/3m³). TPL only.

If this setting is switched on, a central grain hopper will be used, which will feed out to each row unit. This setting is only available for machines without fertiliser and with two WorkStations.

2m³ grain hopper is used for Central Fill when applying fertiliser.

F. Fertiliser.
- None, 3m³, 5 m³ (TPL)
- None, normal, front tank (TPF, TPR, TPT, TPV)

G. Liquid Fertiliser : YES/NO

H. Liquid Fertiliser Working Pressure

I. Microgranulate YES/NO

J. BioDrill, Yes/No

K. BioDrill motors (0/1/2)

L. BioDrill, agitator motor type. Electric or hydraulic.

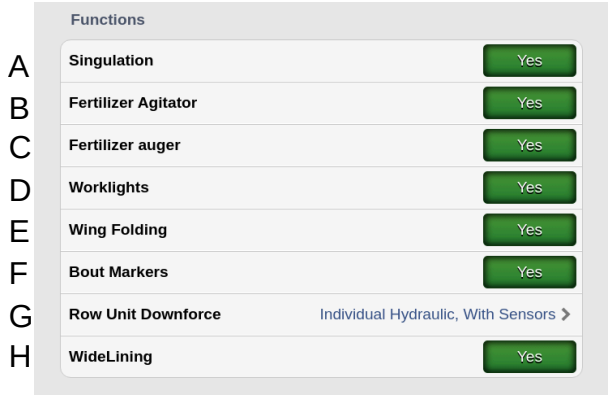

Figure 6.23

A. Singulation YES/NO

B. Agitator, fertiliser YES/NO. TPL only.

C. Auger, fertiliser YES/NO. TPL only.

D. Work light YES/NO

E. Wing folding YES/NO. TPF only

F. Bout marker arms YES/NO

G. Row unit pressure. Mechanical, central hydraulic, individual hydraulic; see *“Figure 6.25 “*

H. WideLining YES/NO. TPF, TPL, TPV only.

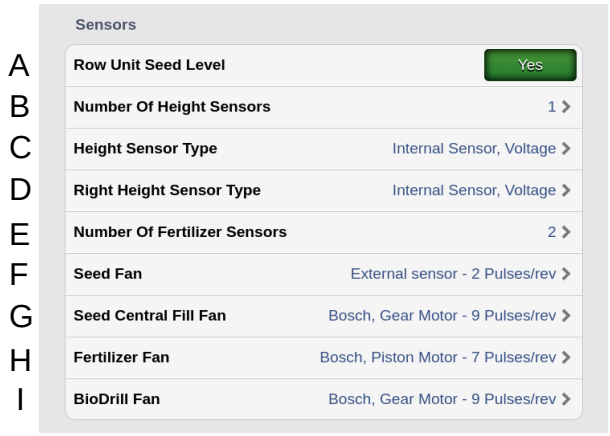

Figure 6.24

Sensors

A. Row unit seed output level YES/NO

B. Number of height sensors. TPF only.

C. Height sensor type, internal sensors, voltage. TPL only.

D. Right height sensor type, internal sensors, voltage. TPF only.

E. Number of fertiliser sensors. Not selectable for TPL

F. Fan pulses per revolution, seed

G. Fan pulses per revolution, Central Fill. TPL only.

H. Fan pulses per revolution, fertiliser, TPL only.

I. Fan pulses per revolution, BioDrill

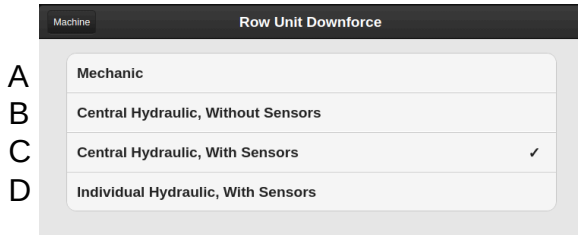

Figure 6.25

Row unit pressure

A. Mechanical

B. Central hydraulic, controlled without sensors

C. Central hydraulic, controlled with sensors

D. Individual hydraulic, controlled with sensors

Table 6.1

Seed output fan	Motor pulses
TPV, TPR, TPT, TPF (external sensor)	2
TPV, TPR, TPT, TPF (internal sensor)	9
TPL with 24 rows or more	5 (Parker piston engine) 7 (Bosch piston engine)
TPL with fewer than 24 rows	9 (Bosch gear motor)

Table 6.2

Fertiliser fan	Motor pulses
TPL with 5 m³ fertiliser hopper	5 (Parker piston engine) 7 (Bosch piston engine)
TPL med 3 m³ gödningslåda	9 (Bosch gear motor)

Table 6.3

FrontHopper	Motor pulses
FrontHopper(external sensor)	2
FrontHopper (internal sensor)	9

6.5 Row unit settings

A warning will be shown before you enter the settings menu: **Do not change any settings in this menu if you are unsure.** An incorrect value could cause a row unit to stop working.

In the settings menu you can change the status of existing row units on the machine. A row unit can be activated, deactivated or disconnected. The row units that are crucial to the machine's operation are marked as mandatory and cannot be deactivated or disconnected.

A red symbol in front of the row unit indicates that a row unit has been physically disconnected.

It is also possible to save or open an already saved row unit setting.

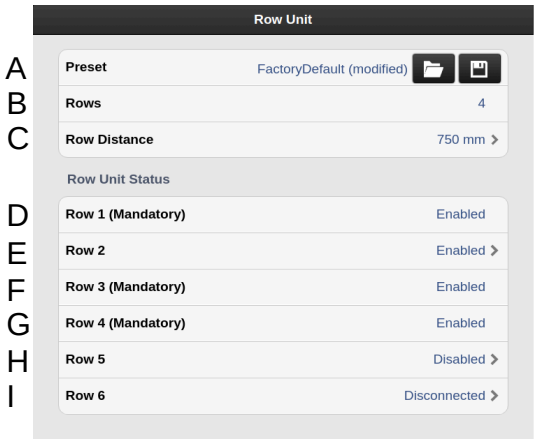

Figure 6.26

A. Preset (factory settings). Open row unit settings, save row unit settings
B. Number of activated rows
C. Row spacing
D. Row 1 (mandatory)*
E. Row 2*
F. Row 3 (mandatory). *
G. Row 4 (mandatory).*
H. Row 5.*
I. Row 6.*

* Activated/Deactivated/Disconnected

6.5.1 Saving a setting

Figure 6.27

To save a row unit setting, select Save by clicking the floppy disk symbol (A); see *"Figure 6.26 "*, and enter a name in the text field displayed.

Close the menu by pressing ✓. To cancel a save in progress, press ✗.

6.5.2 Open a saved setting

To open a saved setting, select the file symbol (A) and select the file to open; see *"Figure 6.26 "*.

Figure 6.28

to open a row unit setting

Press to delete a row unit setting

Press to cancel opening a row unit setting

6.6 Device

When the page opens, a window is displayed warning that incorrect WorkStation settings may cause the machine to stop working. To access the page, you must accept by selecting Yes.

Row unit positioning does not normally need to be performed unless an existing WorkStation unit is replaced. In that case, the new WorkStation unit should be placed on its new row unit.

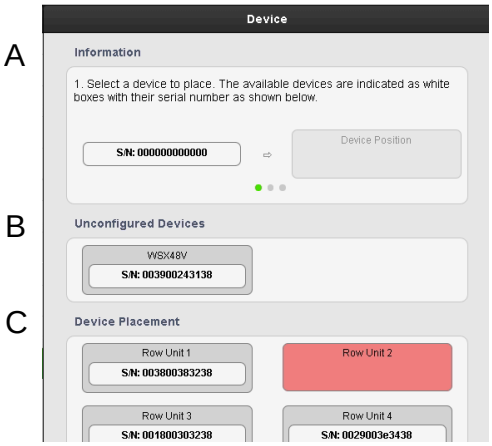

Figure 6.29

All the machine's WorkStation units are displayed here, along with information on which row they are connected to.

A. Information: explanation/guidelines on how to position available units on the machine
B. Unconfigured units.
C. Device placement: All row units should have a device (WSX) connected to them. See instructions under section *"6.5.2 Open a saved setting"* to place the different devices to specific row units.

6.7 Machine geometry

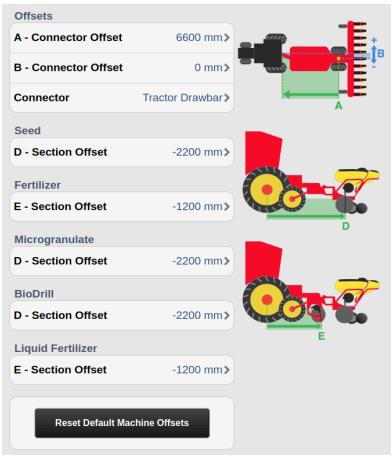

Figure 6.30

Incorrectly entered values can result in incorrect positioning in Task Control.

Enter the information regarding the geometric location of the drill in relation to the tractor:

A. Offset A = Distance between the hitching point and the ground contact point, e.g. gauge wheels. Expressed in mm
B. Offset B = Compensation for any canting. If the machine is pulling in one direction or if it is offset to one side. Expressed in mm.

Offset is indicated by a positive value in the direction of travel. If the application point is located behind the gauge wheels, a negative value is set

C. Connector = Type of coupling device. Three point linkage or hitch.
D. Section offset D = Distance between the ground contact point and the application point. This value together with the value in the field Offset A is the same as the distance between the connecting device and the application point.
E. Section offset E = Distance between the ground contact point and the application point. This value together with the value in the field Offset A is the same as the distance between the connecting device and the application point.

7 Calibration

7.1 Calibration of seed

To access calibration select Settings/Seed

7.1.1 Calibration menu

The desired and measured singulator position is only available for machines with an electrical singulator installed and activated.

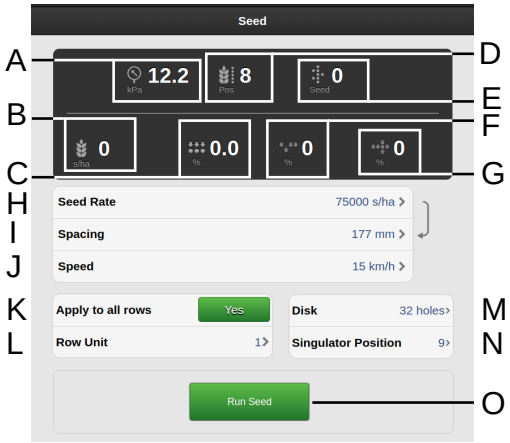

Figure 7.1

A. Air pressure
B. Number of seeds/ha or seed spacing (depending on calibration method)
C. Output quality
D. Measured singulator position. Specified in the range 0 to 20.
E. Amount of seed
F. Number of skips; [8]
G. Number of doubles; [8]

Calibration menu settings (Values are displayed either in metric or imperial units, depending on which one has been selected in the general settings menu).

To choose the seed disc and settings for the metering unit, refer to the chapter “Drilling Recommendations” in the machine manual.

H. Select the calibration method: seed application rate. Specifies the distance between the plants (the selected calibration method is displayed in the operations menu).
I. Select the calibration method: seeds. Specifies the distance between the number of seeds (the selected calibration method is displayed in the operations menu).
J. If the expected driving speed is, for example, 12 km/h, the calibration must be set for a speed of 12 km/h.
K. Select which of the row units that is to be calibrated (i. e. the row that has a calibration bag): Apply to all row units YES/NO. If the calibration is to cover all row units, select YES (basic setting). If calibration is to be carried out individually for only one row unit, select NO
L. Select which of the row units is to be calibrated (i.e. the row that has a calibration bag): Select the row unit to be calibrated. Make sure the correct setting is set in K (NO).
M. Enter the number of holes on the seed disc installed in the metering unit. If the disc contains more than 70 holes, deviations from the specified feed rate are measured in percentages instead of in skips/doubles.
N. Desired singulator position. The desired singulator position is specified within the range of 0 to 20 or "Auto".

   The end values (0 and 20) represent the end positions of the sigulator knob

   If the desired singulator position is set to “Auto”, the singulator dial will automatically move its position between 0 and 20 depending on the number of skips and doubles measured.
O. Calibrate

Calibration

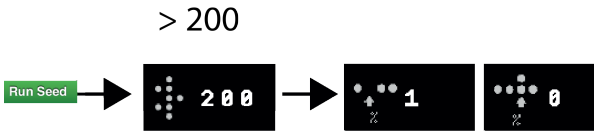

Figure 7.2

The calibration is normally done on one seed feed housing unit and the values are automatically transferred over to the others. If desired, it is also possible to calibrate each seed meter individually

- Check that there is seed in the seed hopper; the depth of seed should be at least 15 cm.

1. Place a calibration bag under the feed for the seed meter that is to be calibrated.
2. Start the fan; the value is displayed in field (A); see *“7.5 Calibration of BioDrill“*. Check that the air pressure is correct (3.5 kPa) in the seed metering unit.
3. Enter the values in the calibration menu.
4. Start the calibration using the (O) button; see *“7.5 Calibration of BioDrill“*and hold it in until the indicated amount of seed fed out is at least 200

8. not available if the machine is equipped with a seed disc with more than 70 holes.

5. Read the proportion of skips and doubles . If any value is too high, adjust the singulator.
   - To reduce the proportion of doubles, reduce the singulator dial's set value.
   - To reduce the proportion of skips, increase the singulator dial's set value.

   Repeat points 4 to 5 until the required accuracy has been achieved

   When the machine is equipped with a seed disc with more than 70 holes, read the percentage deviation from the application rate in the output quality field (D); see *"Figure 7.1 "*and adjust the singulator dial's set value to minimise the deviation.

   For a machine with electric singulation, change the value of the desired singulator position, in order to achieve a better result with fewer skips/doubles. The same applies as for manual adjustment, i.e. if there are many skips, enter a higher value for the singulator position (N); see *"Figure 7.1 "*, and if there are many doubles, add a lower value for the desired singulator position (N)

6. Exit the calibration menu using , or go directly to calibration of another unit
7. Remove the calibration bag and pour the seed back into the hopper.

7.2 Calibration of fertiliser

To access the calibration menu select Settings/ Calibration/fertiliser.

7.2.1 Calibration menu

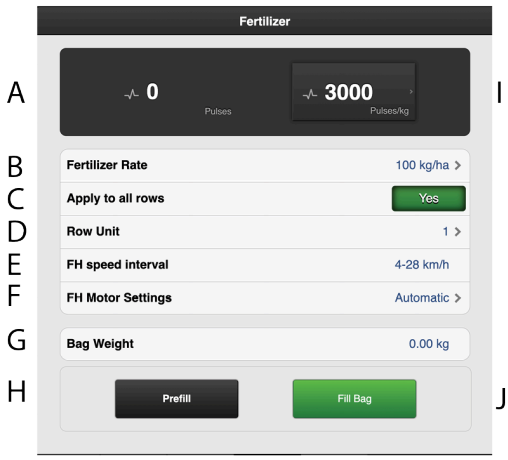

Figure 7.3

Display

A. Calculates the number of pulses

Calibration menu settings (Values are displayed either in metric or imperial units, depending on which one has been selected in the general settings menu).

B. Enter the desired application rate
C. Set the same value for all row units
D. Set value only for selected row unit
E. The appropriate interval for tractor speed
F. FrontHopper motor setup. Specify how to select the motors:
   - The motors are used automatically, one or both depending on what is selected (standard)
   - Choose to use only a specific motor (special).
G. Enter the weight of the contents of the calibration bag filled during calibration
H. Calibrate
I. Calculates pulses/kg. (You can also enter pulses/kg manually by pressing the row and entering the value in the pop-up window.
J. Fill the output system

Calibration

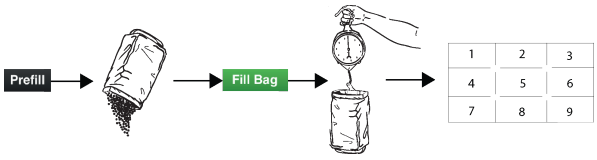

Figure 7.4

The calibration is normally carried out on one feed unit and the values are automatically transferred to the others. If desired, it is also possible to calibrate one feed unit individually.

Before calibration, check that there is a sufficient amount of fertiliser in the fertiliser hopper. The depth of fertiliser in the hopper should be at least 15 cm.

1. Set the feed units and select a feed roller so that it suits the actual fertiliser type.
2. Enter the values in the calibration menu.
3. Fill the output system with the (J) button.
4. Remove and empty the calibration bag. When empty and put back in place.
5. Select the calibration button (H) press and hold until the right amount of fertiliser has been fed into the calibration bag. The pulses from the feed are displayed alongside the pulse symbol.
6. Weigh the contents of the calibration bag. Tip: First reset the scales with an empty calibration bag.

7. Specify the weight of the contents of the calibration bag in field (G) in the calibration menu.

   The number of pulses per kg will be automatically displayed in field (I)

   To enter the number of pulses manually, press field (I) and enter the number of pulses in the pop-up window.

   To cancel the calibration and perform a fresh calibration, repeat points 3 to 7.

8. To exit the calibration menu click on , or go directly to calibration of another unit.

9. Reset the calibration flaps to position B for sowing.

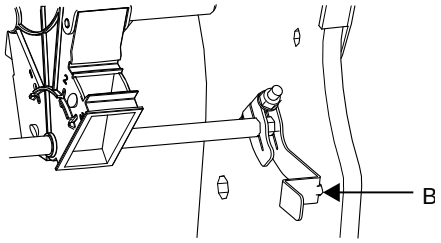

Figure 7.5

- Before drilling ensure that the same type of feed roller is fitted on all feed units.
- Perform a new feed check in the field after drilling about a hectare.
- Check regularly that deposits have not built up on the seed rollers and in the feed units.

7.3 Calibration of liquid fertiliser

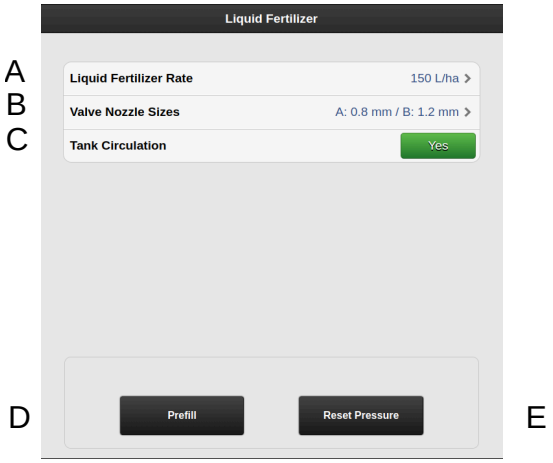

Figure 7.6

A. Enter the desired application rate.
B. Select the nozzle size for the mounted valve A/B.
C. If the liquid fertiliser is to be circulated back to the tank, select ON. If the liquid is only to be circulated back to the pump, select OFF.
D. Output to fill and pressurise the output system in working mode
E. Resetting the pressure control valve in working mode.

7.4 Calibration of microgranulate

To access the calibration menu select Settings/Calibration. Select Microgranulate

7.4.1 Calibration menu

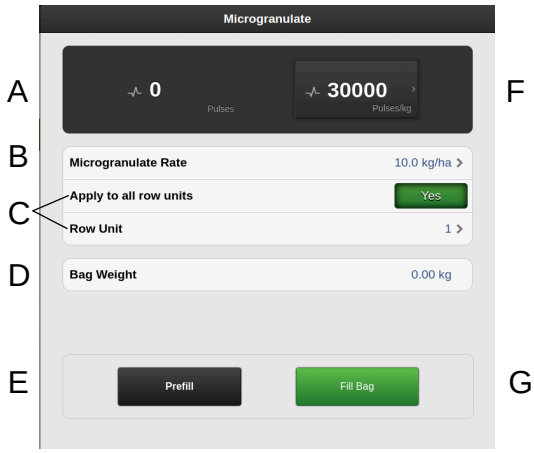

Figure 7.7

Display

A. Calculates the number of pulses.

Calibration menu settings (Values are displayed either in metric or imperial units, depending on which one has been selected in the general settings menu).

B. Enter the required microgranulate application rate.
C. Select which of the feed units is to be calibrated (i.e. a row with a calibration bag).

   The position of the feed units is the same as that of the row unit.

   If the calibration is to cover all output units, select YES (basic setting). If calibration is to be carried out individually for only one row unit, select NO.
D. Enter the weight of the calibration bag contents. Note that the weight can only be indicated when the reported number of pulses is greater than zero.
E. Feed for filling the feed system
F. Calibrate
G. Feed for filling the feed system.

7.4.2 Calibration

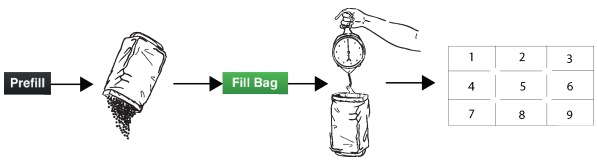

Figure 7.8

Do the calibration on one feed unit and the values are automatically transferred to the others. If desired, it is also possible to calibrate single feed units individually.

Before you do the calibration, check that there is a minimum depth of 15 cm microgranulate the hopper.

1. Set the feed units and select a feed roller that suits the actual microgranulate type.
2. Enter the values in the calibration menu.
3. Fill the output system using the button, (G).
4. Empty the calibration bag and put it back in place.
5. Select the calibration button (E) and keep the button pressed until the right amount of microgranulate has been fed into the calibration bag. The pulses from the output are displayed alongside the pulse symbol.
6. Weigh the contents of the calibration bag. Tip: First reset the scales with an empty calibration bag.
7. Enter the weight of the calibration bag contents in field (D) in the calibration menu. The number of pulses per kg will automatically be displayed in field (F). To enter the number of pulses manually, press field (F) and specify the number of pulses in the pop-up window. To cancel the calibration and perform a fresh calibration, repeat points 3 to 7.

The calibration result becomes the baseline value. Always check the actual feed rate on the field. If necessary correct the pulses/kg. Example: If the feed rate is actually 10% too little, increase the pulses/kg by 10%. Note the fertiliser pulses/kg and the actual feed rate for future use.

8. Exit the calibration menu using  , or go directly to calibration of another unit

- Before drilling, make sure that the same type of feed roller is fitted to all feed units.
- Do a new feed check in the field after drilling about a hectare.
- Check regularly that deposits have not built up on the seed rollers and in the feed units.

7.5 Calibration of BioDrill

7.5.1 Calibration menu

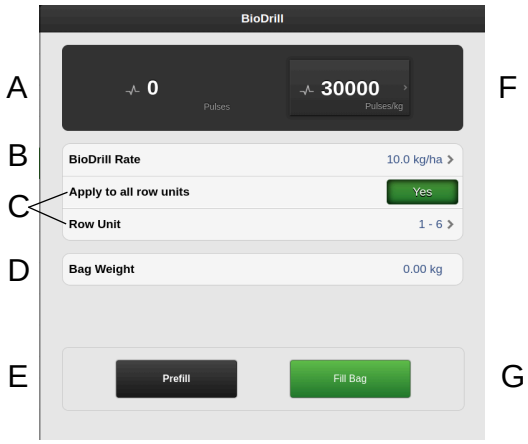

Figure 7.9

A. Calculates the number of pulses.

Calibration menu settings (Values are displayed either in metric or imperial units, depending on which one has been selected in the general settings menu).

B. Enter the preferred sown amount for BioDrill.
C. Select which of the feed units is to be calibrated (i.e. a row with a calibration bag).

   The position of the feed units is the same as that of the row unit.

   If the calibration is to cover all output units, select YES (basic setting). If calibration is to be carried out individually for only one row unit, select NO.
D. Enter the weight of the calibration bag contents. Note that the weight can only be indicated when the reported number of pulses is greater than zero.
E. Calibrate
F. Calculates pulses/kg. (You can also enter pulses/kg manually by pressing the row and entering the value in the pop-up window.)
G. Feed for filling the feed system

To calibrate BioDrill, follow the guidelines in *"7.4.2 Calibration"*.

7.6 Calibration of machine and radar

The other calibration pages define calibration related to different products while this chapter presents motor calibration for different machine functions and motors as well as the calibration of radar.

Press "Calibrate" to start calibrating selected functions or motors for the machine.

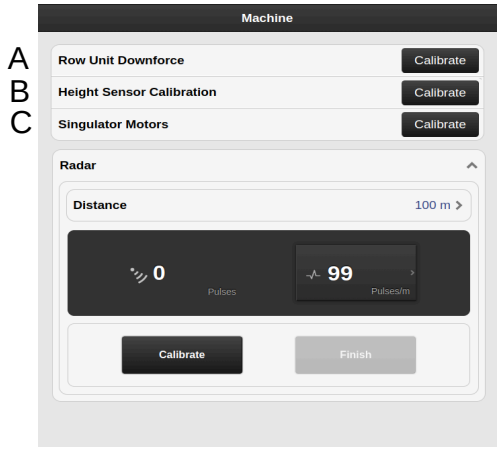

Figure 7.10 Machine calibration

Fields on the screen:

A. Row unit downforce calibration
B. Height sensor calibration
C. Singulator motors calibration

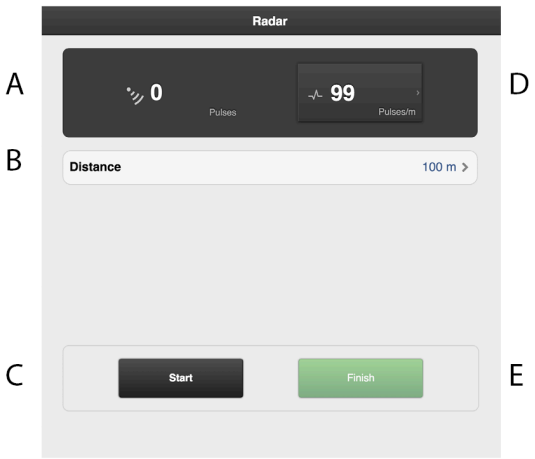

Figure 7.11 Calibration of radar

A. Displays the total number of radar pulses whilst operating
B. Field to enter the distance driven when calibrating.
C. Resets the number of radar pulses.
D. Displays the calibration result as the number of radar pulses/m.
E. Records the end of the calibration distance.

Calibration

1. Measure a specific distance (at least 100 m).
2. Press (C) at the starting point to reset the pulse counter. It is possible to reset several times, if necessary.
3. Drive the selected distance with the machine lowered to the drilling position and press (E) at the stop point.
4. Press the field (B) and enter the distance driven in metres.
5. The number of pulses per metre driven is calculated and automatically updated in field (D).

7.7 Checking lift and output levels

Figure 7.12

Settings

Setting the level for the drilling position (TPF) and the LowLift position (TPF and TPL), as well as setting the levels for output start and output stop..

For TPT, TPV and TPR, the setting is only available if the tractor provides the height of the 3 point linkage via the ISO11786 connector or the ISO11783 connector. Refer to Height Source in Chapter *"6.1 General machine settings"*

A. **Lift height** The machine's momentary height.
B. **LowLift** The set value is a percentage of the level for a fully raised machine, which is 100. The maximum LowLift level for TPL is 20. (TPF, TPL)
C. **Feed start**The level at which the seed meter begins feeding out seed when the machine is lowered into the drilling position. The default values are the relative current values for the LowLift and drilling positions (for the machines where they are available). If the LowLift or drilling positions are changed, the output start level will also be adjusted.
D. **Feed stop** The level at which the seed meter stops feeding out seed when the machine is raised to the LowLift position. The default values are the relative current values for the LowLift and drilling positions (for the machines where they are available). If the LowLift or drilling positions are changed, the output start level will also be adjusted.
E. **Sowing position** (TPF)
F. **Headland lock** (only for mounted machines, TPR, TPT, TPV) The headland lock indicates the height at which the position of the row units is locked when the machine is raised above the given value.
G. **Indication arrows**

The drilling position should not be changed when feed start, feed stop or LowLift are set! The setting is made during basic machine setup.

(The drilling depth is set individually for each row unit.)

Adjustment

1. Press the button for the function to be set in the field with the height scale. The corresponding function button can also be pressed on the VT.
2. Raise or lower the drill unit to the desired position using the hydraulic lever. The indicator arrow (G) follows the drill unit's movement along the height scale.
3. Confirm the value between each setting.

and can never be higher than or lower than .

can never be higher than .

7.8 Task Control

Task Control is a GPS-based help function to use in the field. A GPS terminal supporting this function is required for Task Control to work correctly. Contact your local GPS supplier to ensure that you have the correct functionality

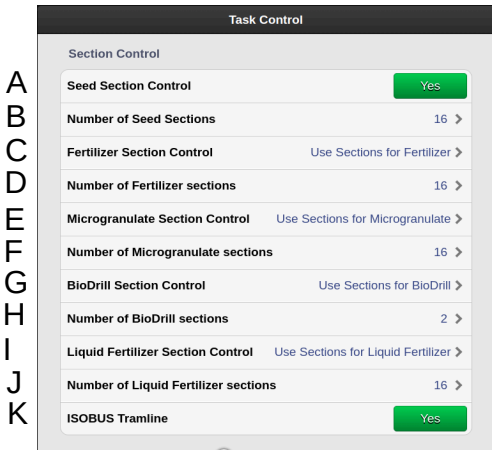

Figure 7.13

Functions

A. Shut-off by row, sowing

B. Number of sections, seeding = Max number of units that the monitor sends to the Task Controller screen. If this is exceeded, then several row units will share one section.

   Example: a 32-row machine with a maximum number of 16 sections installed, results in only 16 sections being reported on the screen

C. Shut-off by row, fertiliser.

   Three options are possible:
   - Same as shut-off by row for seeding (A)
   - Specific shut-off by row for fertiliser
   - No shut-off by row

D. Number of sections, fertiliser

E. Shut-off by row, micrograniulate.

   Three options are possible:
   - Same as shut-off by row for seeding (A)
   - Specific shut-off by row for micrograniulate
   - No shut-off by row

F. Number of sections, micrograniulate

G. Shut-off by row, BioDrill.

   Five options available for selection:
   - Same as shut-off by row for seeding
   - Specific shut-off by row for BioDrill
   - No shut-off by row
   - Same shut-off by row for micro granulate
   - Same shut-off by row for fertiliser

H. Number of sections BioDrill

I. Shut-off by row, liquid fertiliser

   Three options available for selection
   - Same shut-off by row as for sowing (A)
   - Specific shut-off by row for liquid fertiliser
   - No shut-off by row

J. Number of sections, liquid fertiliser.

K. ISOBUS controlled tramlining : YES/NO

Figure 7.14

L. Seed

M. Fertiliser

N. Micrograniulate

O. BioDrill

P. Liquid fertiliser

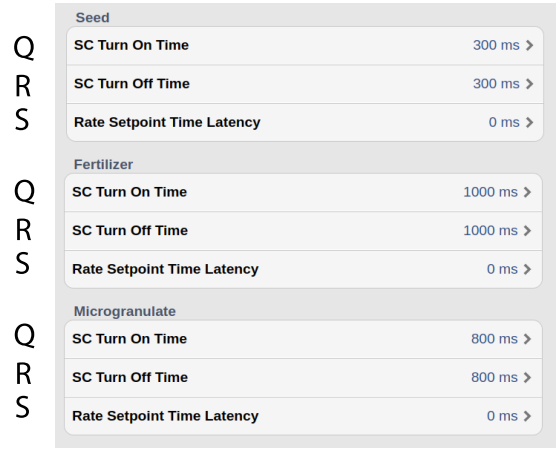

Figure 7.15

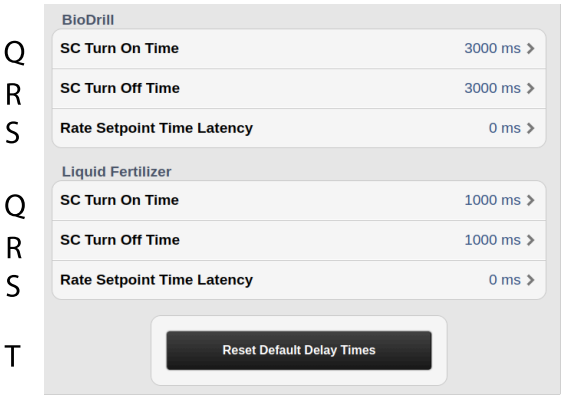

Figure 7.16

Q. SC Turn Off Time = Time compensation for seed transportation (switch off)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has stopped rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor stops rotating 0.3 seconds (300 ms) before the expected shut off

Units in this field should be entered in ms.

R. SC Turn On Time = Time compensation for seed transportation (switch on)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has begun rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor begins rotating 0.3 seconds (300ms) before the expected switch on. Units in this field should be entered in ms.

Units in this field should be entered in ms.

S. Section Y = Distance between the point of ground contact and the point of application

This value together with the value in the field Offset Y is the same as the distance from the coupling unit to the seed coulter.

If the coulters are placed in front of the gauge wheels, a negative value can be entered here.

T. Button, Reset Default Delay Times

8 Operational settings

Operational settings are available in the following instances:

- Always for TPF.
- On machines with hydraulic row unit pressure.
- When the FrontHopper 2200 FrontHopper is used.

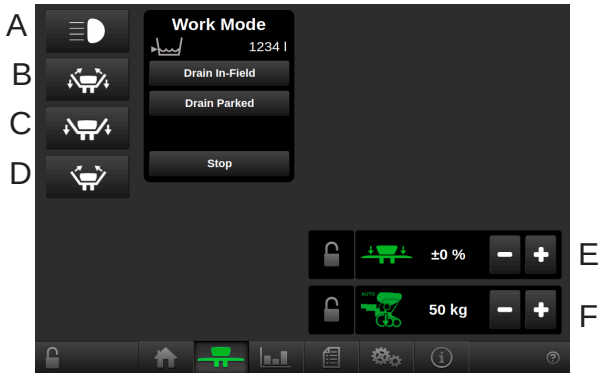

Figure 8.1

A. FrontHopper work lights

   Switches the work lights on the FrontHopper ON/OFF. [9]

B. Wing folding[10]
C. Leave transport position[10]
D. Return to transport position [10]
E. Current row unit pressure. Row unit pressure is adjusted using the +/- buttons. [11]
F. Additional wing pressure :Wing pressure is connected to the row unit pressure but can be adjusted if needed. Use the +/- buttons to increase/decrease wing pressure in percentage in relation to the row unit pressure. The presented percentage represent the adjustment in relation to the row unit pressure.
G. Liquid fertiliser (Work mode)

The symbols for row unit pressure and wing pressure are green when the function is active; otherwise, they are grey

8.1 Liquid fertiliser operations (only TPL with liquid fertiliser)

The panel shows different configurations depending on which mode the machine is in. The mode is set using a physical knob on the fertiliser hopper.

8.1.1 Closed mode

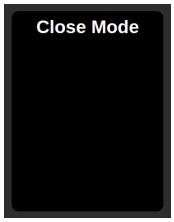

Figure 8.2 Mode close

8.1.2 Fill mode

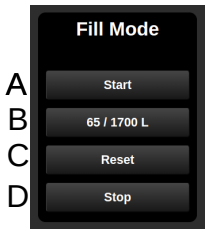

Figure 8.3 Mode fill

Hose must be connected to the machine's filling outlet.

A. Start filling the hopper
B. Specify how much the tank should be filled. The current fertiliser fill level is displayed
C. Reset current fertiliser fill level.
D. Stop filling the tank.

8.1.3 Working mode

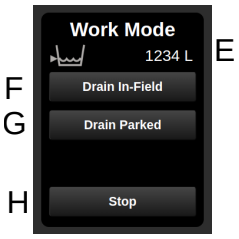

Figure 8.4 Mode work

E. Current tank level.
F. Drain tank in field.
G. Drain tank while parked. Hose must be connected to the machine's drainage outlet
H. Stop drainage.

9. Only available if the FrontHopper 2200 fertiliser option is activated.
10. Only available on TPF.
11. Only available on TPF and TPL equipped with hydraulic row unit pressure.

8.1.4 Wash mode

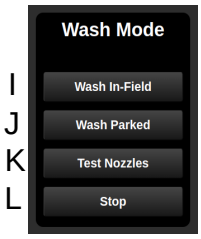

Figure 8.5 Mode wash

I. Wash in field.
J. Wash while parked.
K. Test nozzles. Feeds one section at a time.
L. Stop washing or nozzle testing.

9 Statistics

Times are only recorded for when some type of sowing activity is in progress.

Go to the statistics menu by pressing the statistics field.

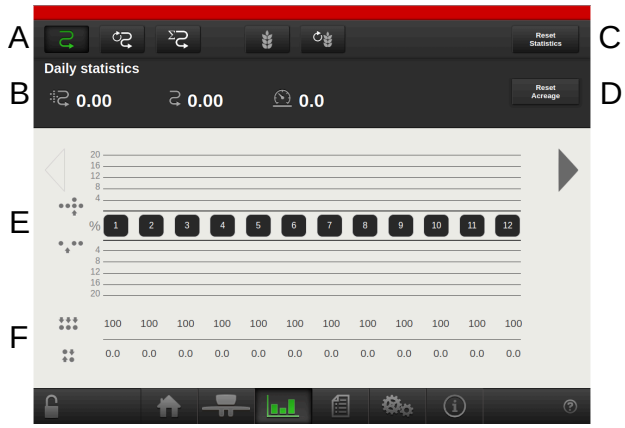

Figure 9.1

The operations statistics menu shows statistics for the current drilling operation, for the current season and for the total service life of the seed drill.

Depending on whether the machine is equipped with a seed disc with fewer or more than 70 holes (see chapter *"7.1 Calibration of seed"*), what is displayed will be either skips/doubles or the percentage deviation from the specified feed rate

Operating statistics

A. Section A

Current drilling operation

Season

Total

number of sown seeds for the day

number of sown seeds for the season

B. Section B

area sown

area driven with the machine in work position

average speed

C. Reset statistics for current drilling operation and season (data in the grey box). Statistics for total service life cannot be reset.

D. Resets the numbers for hectares.

Drilling performance

E. Average number of skips and doubles for the current drilling operation and season.

F. The variation coefficient for the current drilling operation (based on the last 200 seeds sown).

Drilling performance when the machine is equipped with a seed disc with more than 70 holes

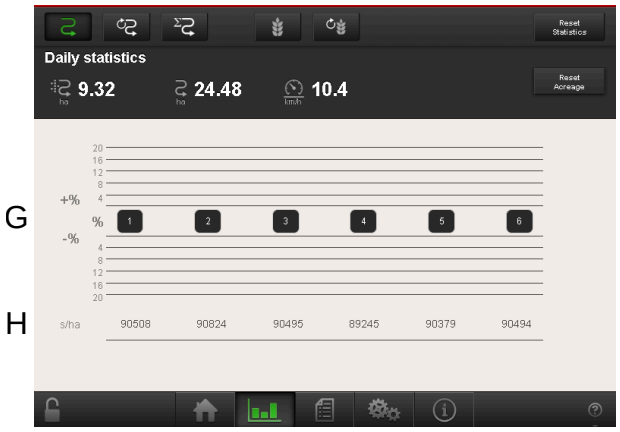

Figure 9.2

G. Percentage deviation from the specified feed rate.

H. Average distance between seeds or seeds per hectare

A value with a different background indicates that an alarm has been activated.

Calculation of average sown amount (seeds per hectare) based only on active rows. If one or more rows are switched off due to tramlining, the average sown amount in the statistics menu will be different to reality. If an increased seed rate for adjacent tramlining is selected, this will affect the average sown amount in the statistics menu.

10 Alarms

When an alarm is triggered, an audible signal will be emitted and the alarm will be displayed visually on the home screen. Enter the alarms menu by pressing the alarm symbol. The nature of the alarm is directly described on the screen. If an alarm relates to one or more specific row units, all the row units are displayed as a line of numbered blocks where the row unit(s) indicating alarms are shown in a different colour.

Correct the fault(s) that caused the alarm(s) and dismiss one alarm at a time or all the alarms at once.

An overridden or acknowledged alarm, if it is still active, will be displayed at the bottom of the alarm list as overridden or acknowledged; see *"Figure 10.1 "*.

The machine is normally not usable if at least one critical alarm is active. To be able to operate the machine, it is necessary to remedy the fault that the alarm refers to or override the alarm. An overridden alarm is an active critical alarm in cases where the user has chosen to continue using the machine even though certain functionality may be affected.

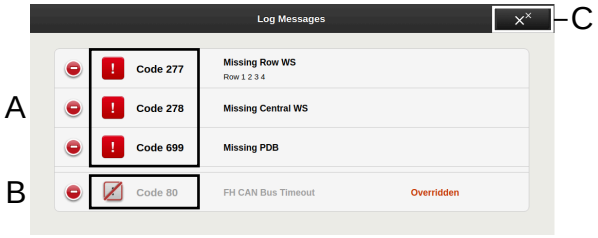

Figure 10.1

A. Examples of alarm codes
B. Examples of overridden alarms
C. Acknowledge all alarms.

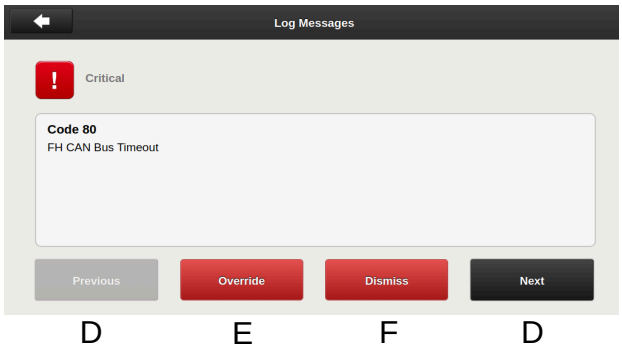

Figure 10.2

D. Move UP and DOWN in the list of alarms.
E. Override selected alarm.
F. Dismiss selected alarm.

- After a critical alarm has been acknowledged, the system will automatically restart.

Individual alarms can be acknowledged or overridden without needing to open the alarm information. Proceed as follows:

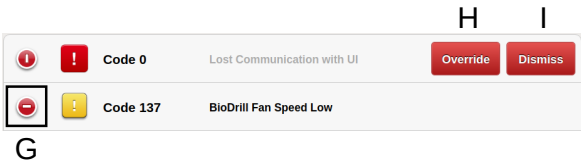

Figure 10.3

1. Click the red symbol (G).
2. Press H to override the alarm or I to acknowledge the alarm.

In section all alarms are described with the suggested action required.

10.1 Alarm levels

If a critical alarm is triggered, the feed on all units stops. The error condition must be dealt with and the alarm acknowledged before the feed is restarted.

- **Yellow** marking means **Warning**

  Operation of the machine may continue, but the error condition should be remedied as quickly as possible.
- **Red** marking means **Critical**

  The machine should not be driven any further. Remedy the fault immediately or choose to override the alarm knowing that the machine is not fully functional or may be damaged.

The alarm levels are set in the alarms menu under settings; see *"6.2 Alarm levels"*

11 Information

The Information button on the home screen is used to access the page where detailed information is displayed about the machine's gateway and units, such as WorkStations and PDBs, as well as the machine's alarm history.

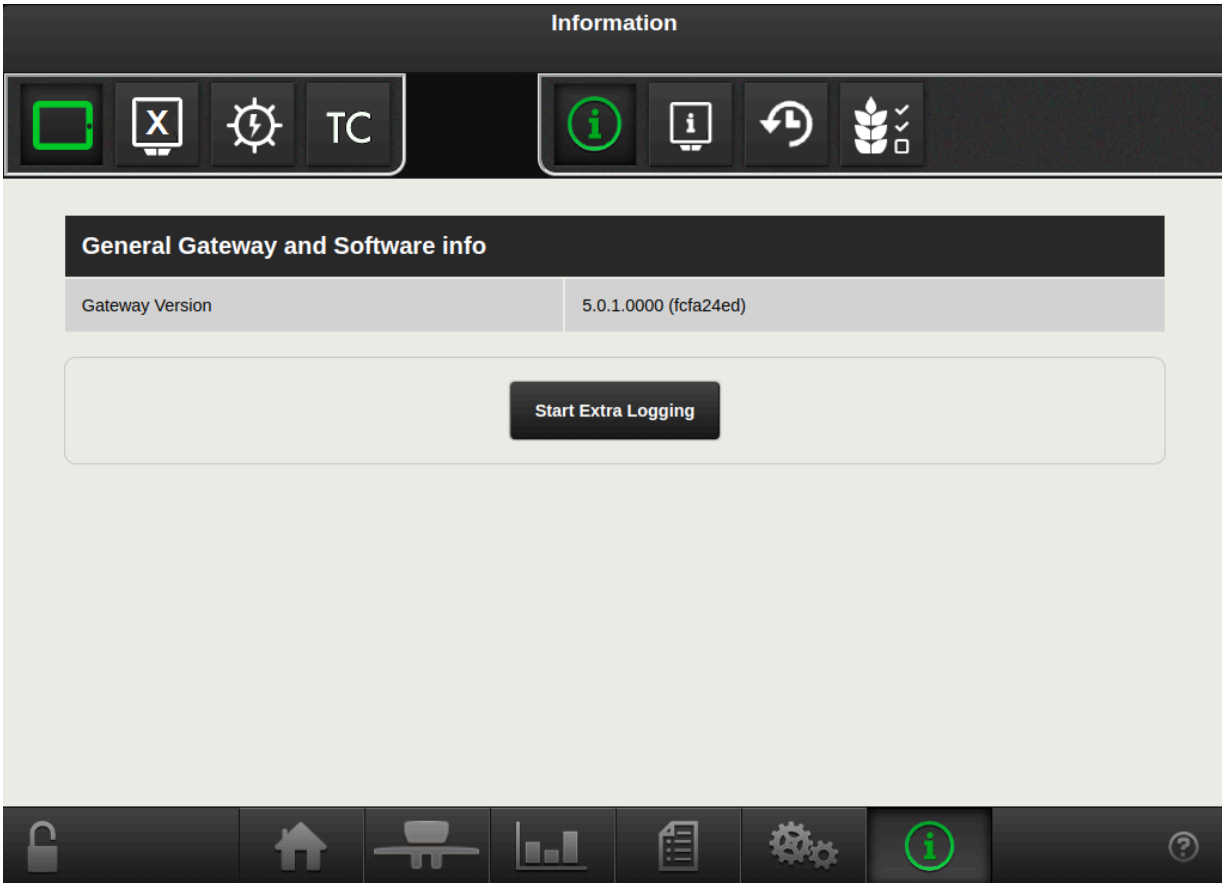

Figure 11.1 General information for Gateway software

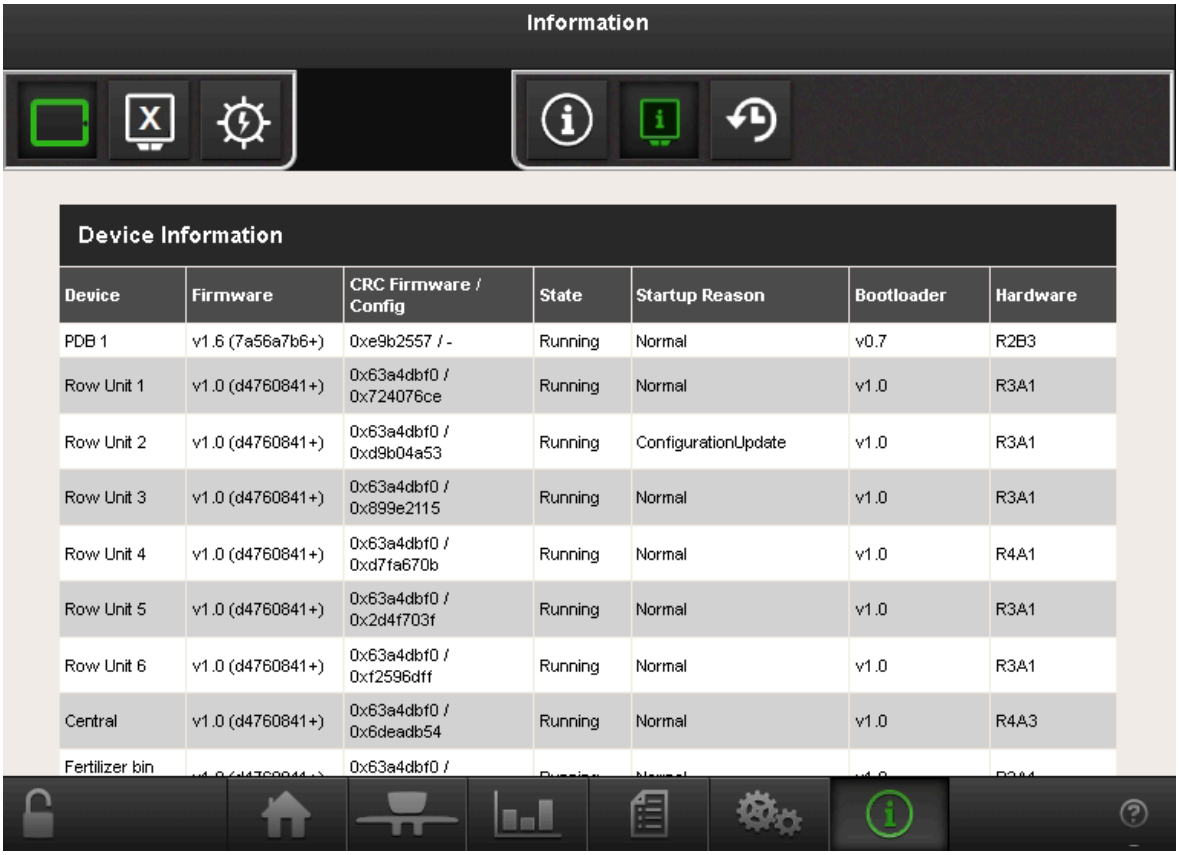

Figure 11.2 Information about the units on the machine, such as software and hardware, and status.

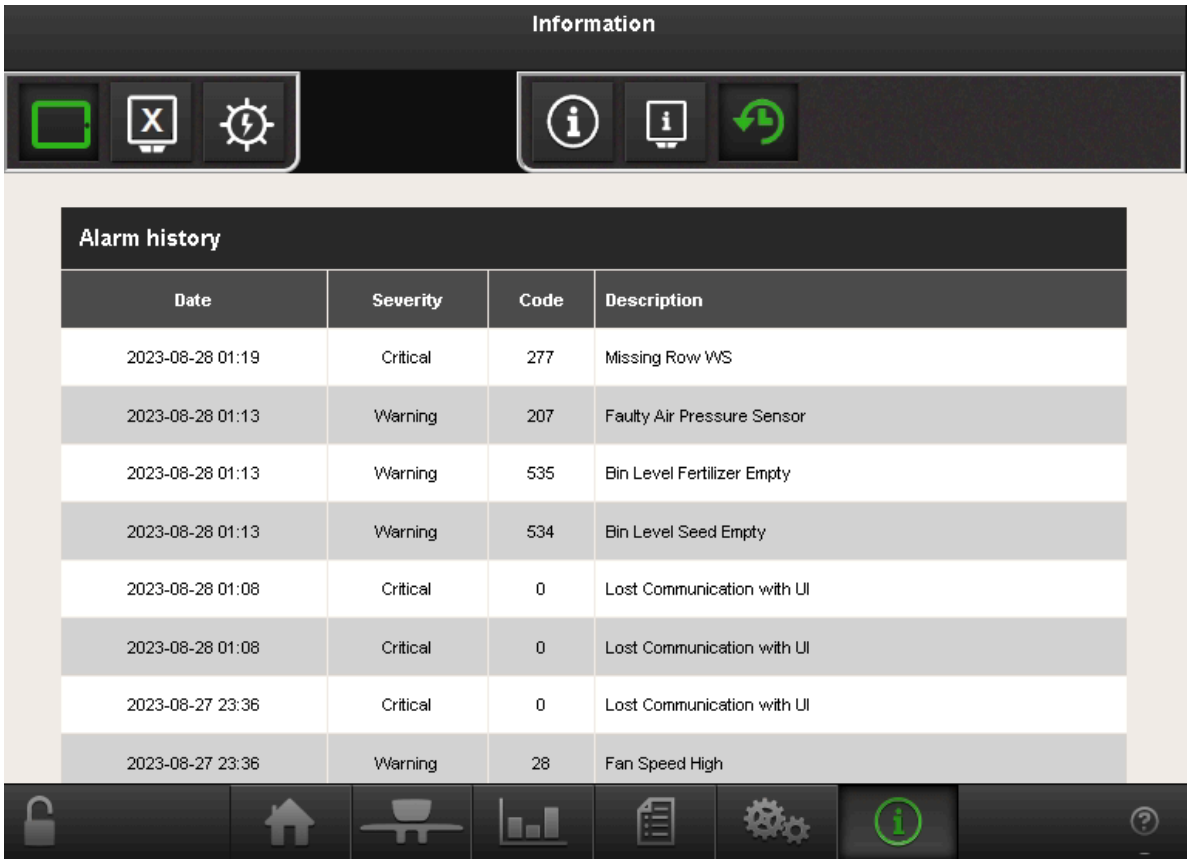

Figure 11.3 Date and time, alarm code, alarm description

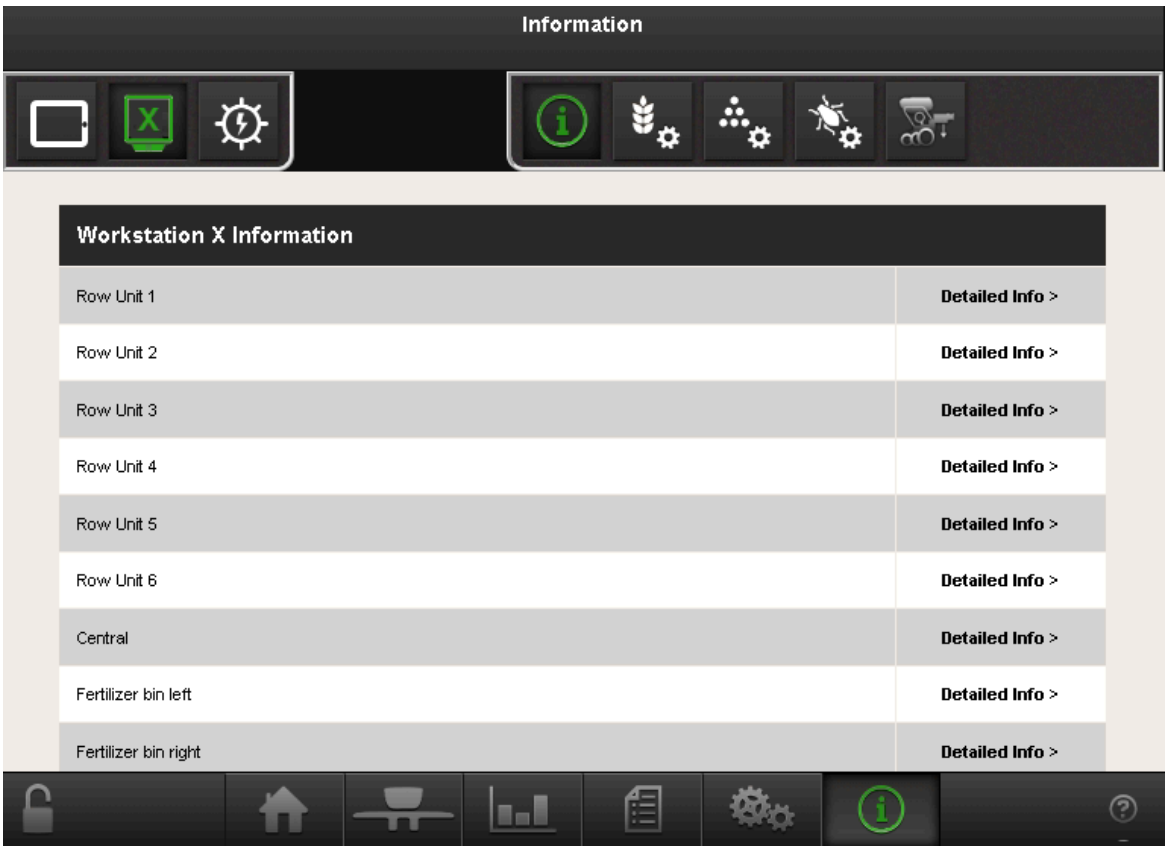

Figure 11.4 Information about all the machine's row units

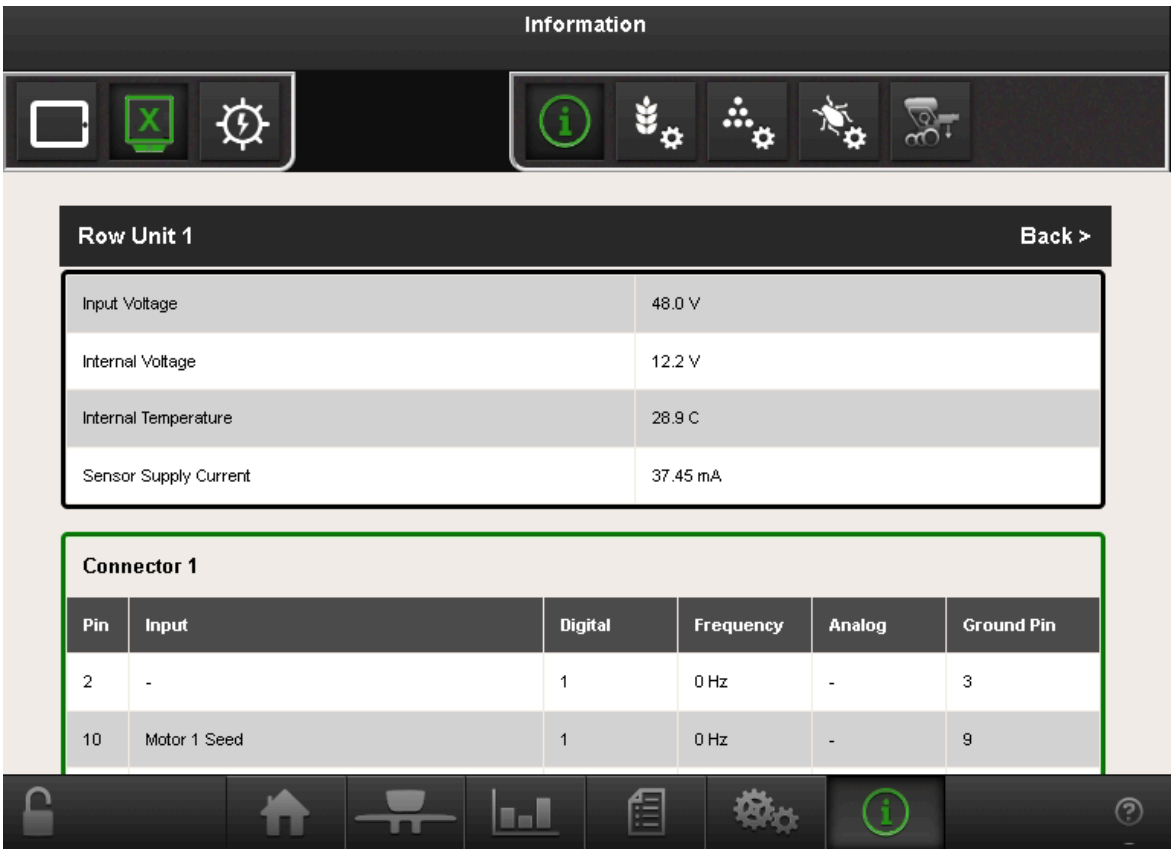

Figure 11.5 Detailed information about a given row unit

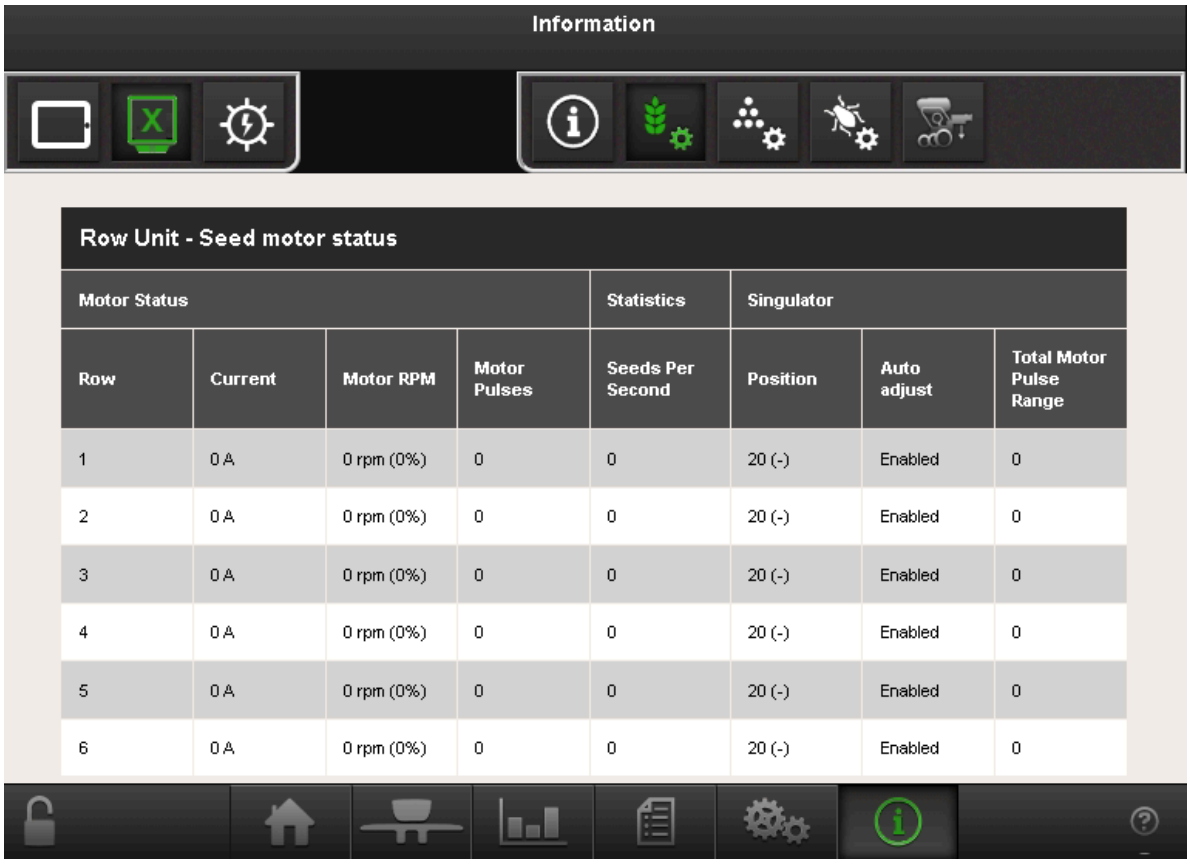

Figure 11.6 Row unit information: status of the seed motors, as well as the singulator motors if there is electrical singulation

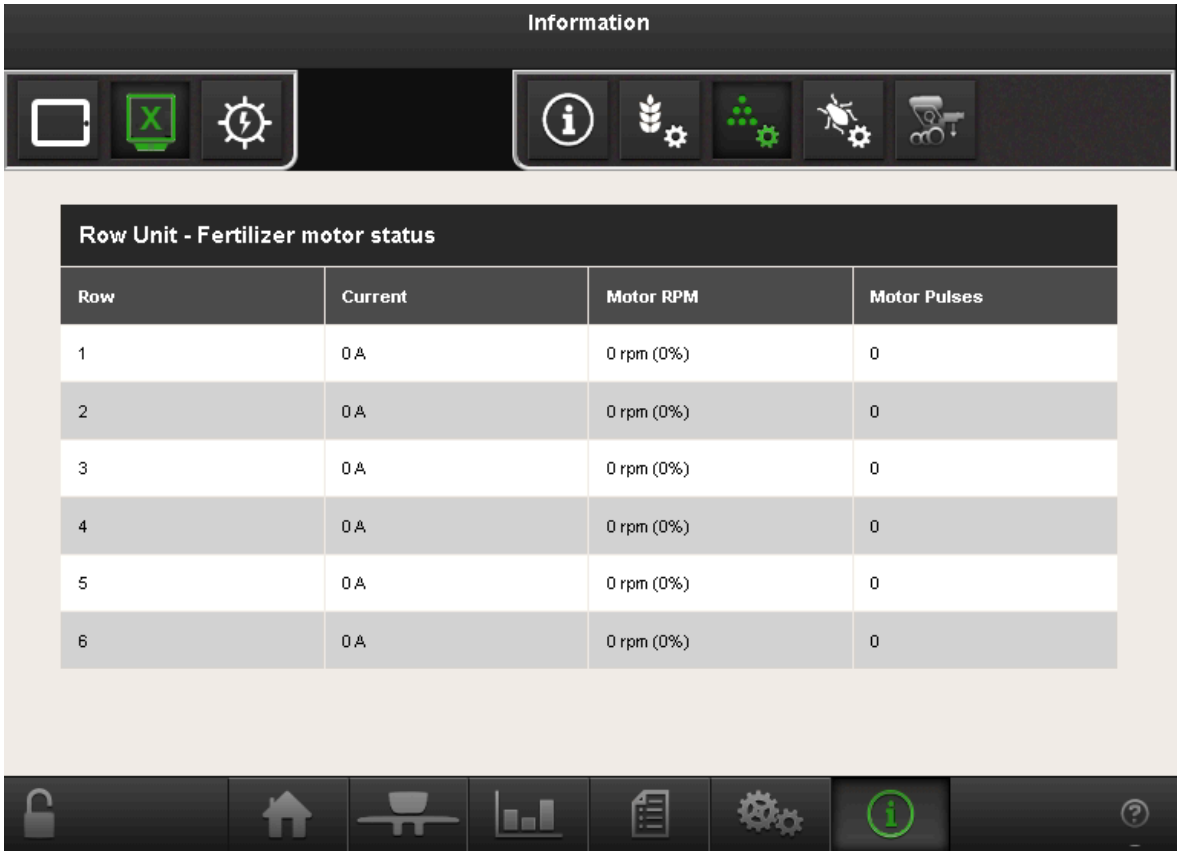

Figure 11.7 Row unit information: status of the fertiliser motors

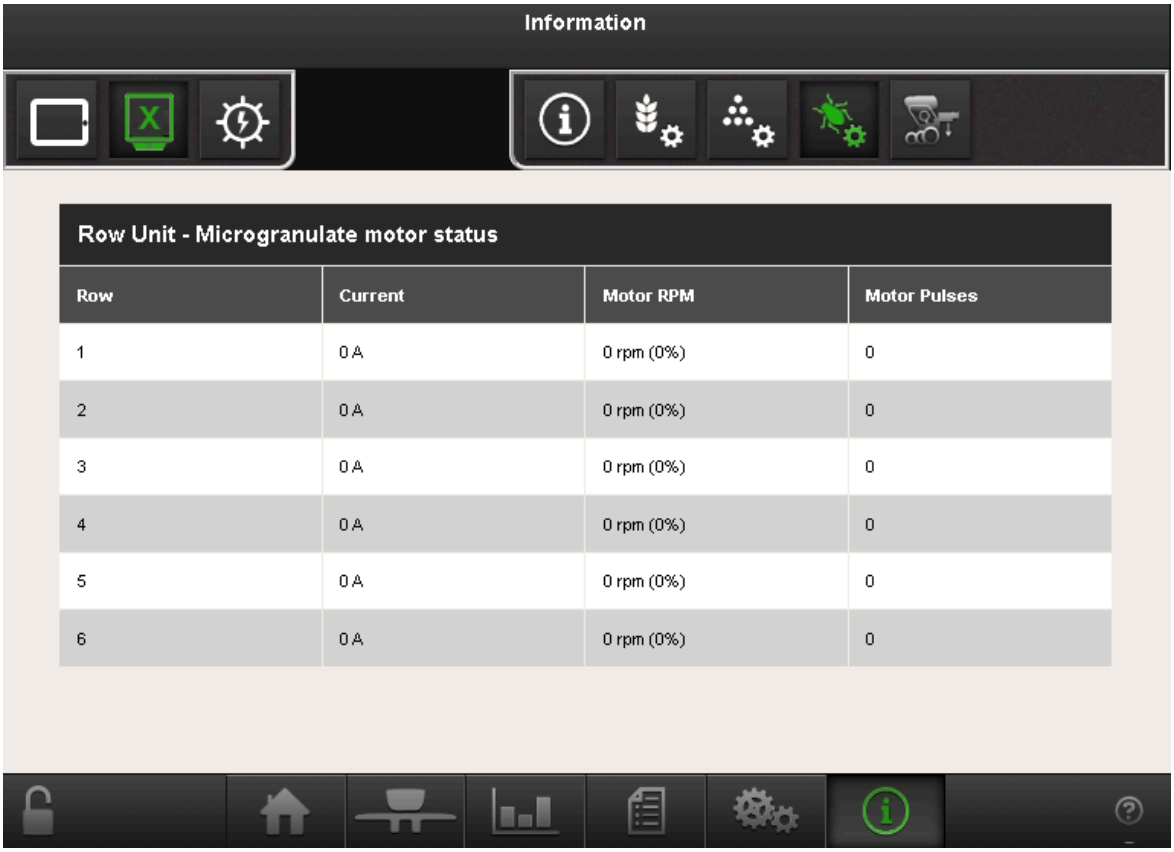

Figure 11.8 Row unit information: status of the microgranulate motors

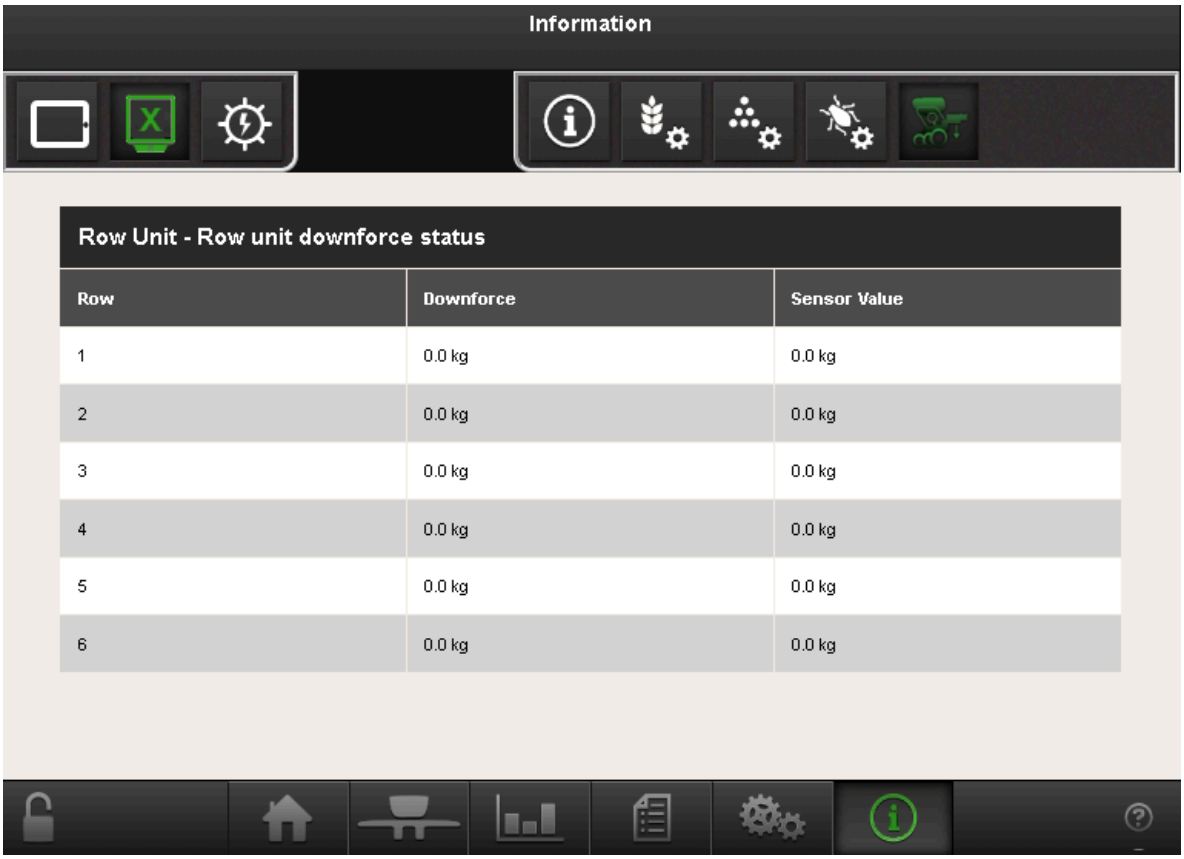

Figure 11.9 Row unit information: status of row unit pressure

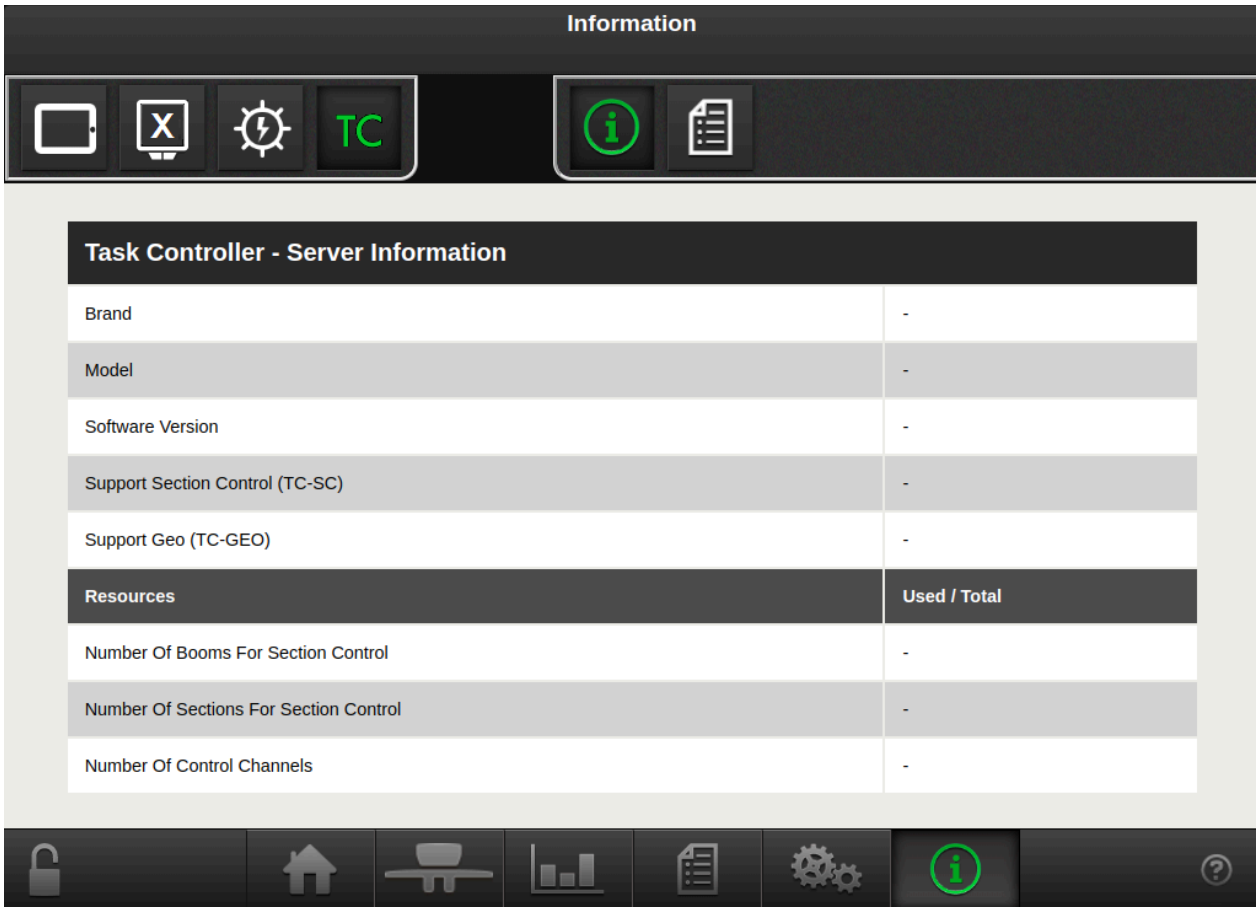

Figure 11.10 Task controller server Information.

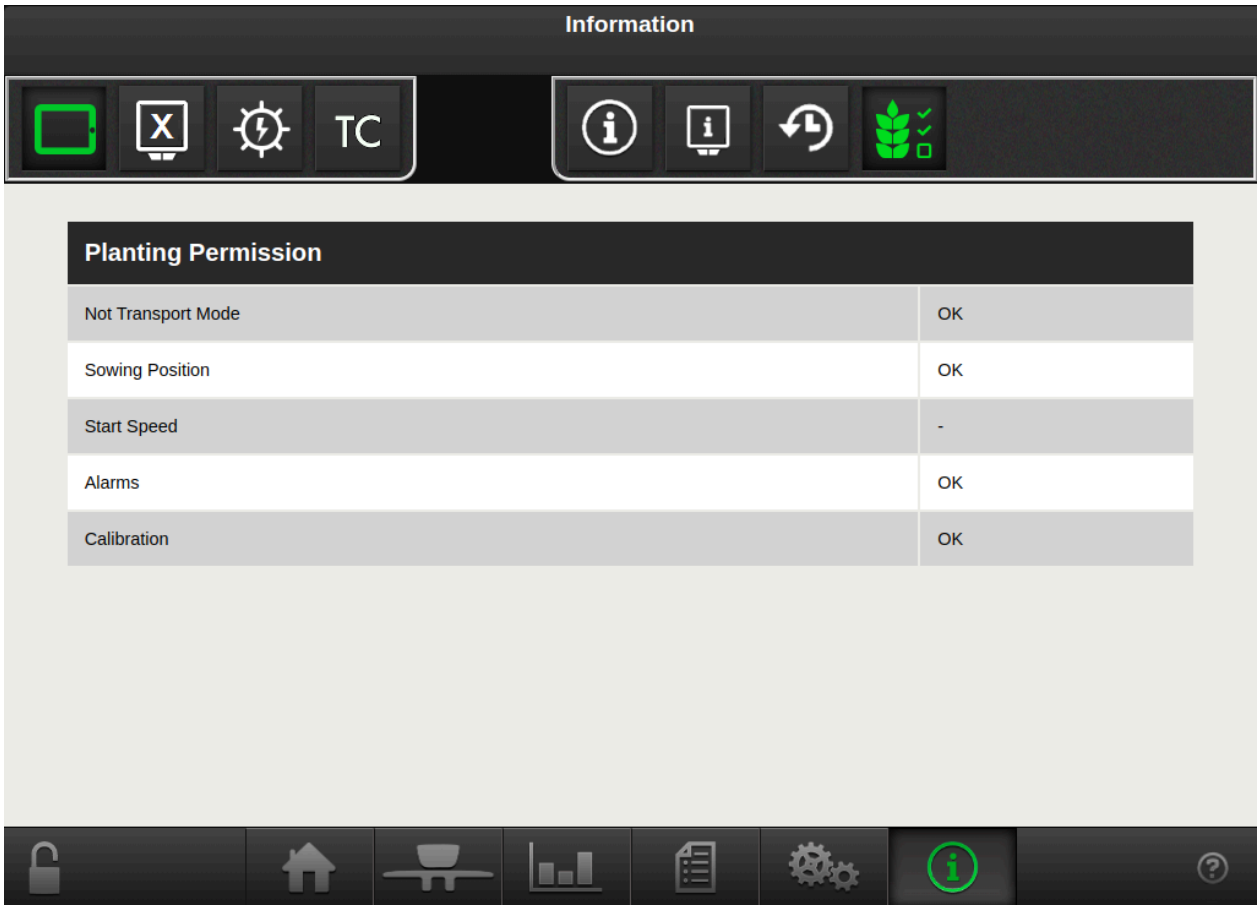

Figure 11.11 Information planting permission

12 Virtual Terminal (ISOBUS)

Note that certain functions require E-control.

12.1 The home screen

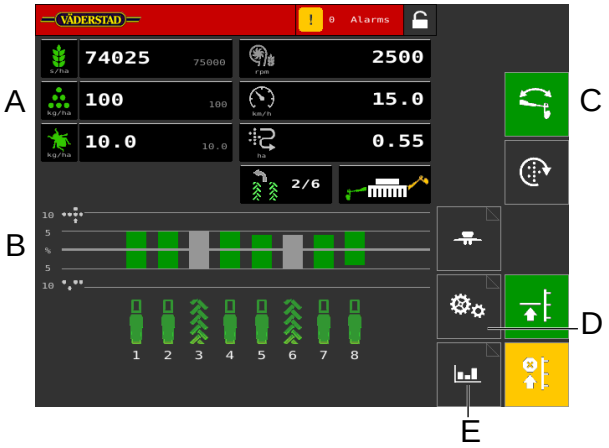

Figure 12.1

The home screen

The home screen is the view shown whilst operating All the information that it is important to monitor is shown here, and all necessary settings can be made here too.

A. Display for control and monitoring; see *"12.1.1 Row units"*and *"12.1.2 Work display"*
B. Row units. You can switch off a row unit here (it will then be marked in grey)
C. Function buttons for settings when drilling; see *"12.1.3 Function buttons"*
D. Navigation buttons that open submenus for basic settings and alarms; see *"12.2.1 Menu settings"*
E. Opens statistics page.

The location of the display and function buttons may vary between different terminals but the symbols are always the same.

If the home screen does not show all function buttons in the same view, you have the ●●● button, which toggles to other function buttons.

By pressing on the field for the seed application rate, you can adjust the application rate directly on the home screen. Row units can be switched OFF/ON by pressing on a row unit

Navigation buttons

Operational settings. This is where the settings are entered for hydraulic row unit pressure. (If the machine is equipped with hydraulic row unit pressure and the function is activated.)

General settings and calibration. No settings in this menu need to be made during operation.

Alarms. Press the button to access the alarms menu. The alarms menu shows a detailed description of the nature of the alarm; alarms can also be acknowledged here. The digit in the button shows the number of active alarms. This button is only shown if there are active alarms

Back. This button is only shown in submenus and takes you back to the previous view or the home screen.

The padlock at the top of the screen indicates whether master status has been obtained or not. A white padlock indicates that master status has been obtained, while a red padlock means that the terminal is in slave mode. A request to switch to master status can be made by clicking on the red padlock. On start-up, the terminal always defaults to slave mode.

12.1.1 Row units

When you raise and lower the machine, all row units always start automatically..

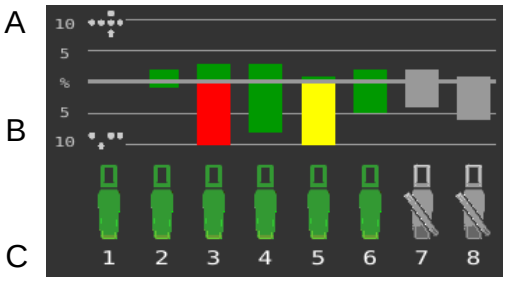

Figure 12.2

Bars

A. The number of doubles – The bar indicates the row unit's number of doubles as a percentage.
B. The number of skips – The bar indicates the row unit's number of skips as a percentage.
C. Row number

If you use quantity output (seed disc in the seed meter with more than 70 holes), the deviation from the sown amount is shown as a percentage in fields A and B.

A bar chart is displayed for each row unit, which monitors the output. Status indication and a row unit number are also displayed. For more information on row unit statuses, see

It is possible to switch on/off the feed from an individual row unit directly on the screen by pressing on the row unit to be changed. Restart the feed by pressing the same row unit again.

Colour of the bars

Drilling quality here refers to the number of skips and the number of doubles..

- Green bar = drilling quality within approved area
- Yellow bar = drilling quality is >= 50% of set alarm level
- Red bar = drilling quality is >= 100% of set alarm level..

The levels for the different alarms are set in the alarms menu in general settings.

12.1.2 Work display

The fields in *"12.1.2 Work display"* show work monitoring on the home screen.

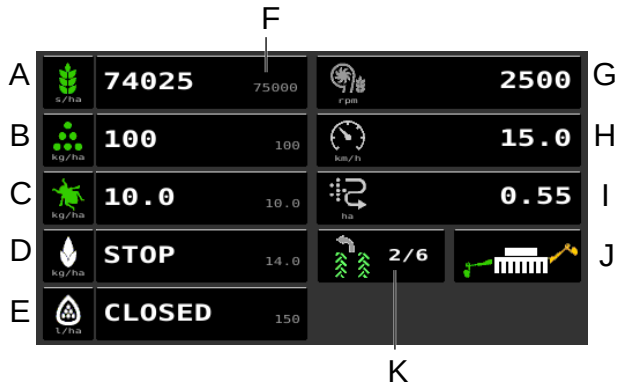

Figure 12.3

Fields on the home screen:

A. **Seed application rate** Depending on the calibration method, either seed spacing or the amount of seed per hectare will be displayed.
B. **Fertiliser application rate** The feed can be switched off and on by pressing the fertiliser symbol.
C. **Microgranulate application rate** The feed can be switched off and on by pressing the micro-granulate symbol.
D. **BioDrill rate** The feed can be switched on and off by pressing the BioDrill symbol.
E. **Liquid fertiliser rate** The feed can be switched off and on by pressing the liquid fertiliser symbol.
F. **Target feed rate** By tapping the field for the feed rate, a pop-up window for variable adjustable application rate appears. See *"13.10 Variable adjustable application rate"*
G. Press the field to switch values. The button can switch between:


Driving speed


Area meter


Fan rotation speed, seed


Fan rotation speed, fertiliser

Fan speed, Central Fill


Fan speed, BioDrill


Air pressure

Air pressure, Central Fill


Air pressure, liquid fertiliser


Pump speed, liquid fertiliser


Tank level, liquid fertiliser

H. Press the field to switch value. The button can switch between the values in the list above.
I. Press the field to switch value. The button can switch between the values in the list above..

J. **Bout marker switching** Shows the current position of the bout marker arms. Press the field to switch bout marker. Switches manually or automatically depending on selection with the function button.  .

K. **Tramlining** The first number shows which phase of the tramlining cycle you are in. The second number is the number of tramlining cycles selected in the tramlining menu. Here it is possible to advance up through the bouts in numerical order..

During operation, it is a good idea to check at regular intervals that the air pressure in the seed feed housing is maintained at 3.5 kPa.

12.1.3 Function buttons

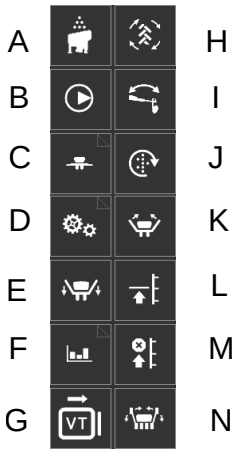

Figure 12.4

A. Front hopper activation
B. Shut-off of liquid fertiliser pump control for TPL.
C. Operational settings
D. Basic settings
E. Leave transport position
F. Statistics
G. Move to next VT
H. Auto advance
I. Bout marker switching
J. Manual output
K. Transport position
L. LowLift
M. Lift stop
N. Wing folding

12.2 Settings

12.2.1 Menu settings

Settings are accessed via the (E) button on the home screen *"Figure 12.4 "* (this may vary slightly between machine models). Use the navigation buttons for area-specific settings. The green button shows the active selection.

To change the settings – **press** the relevant field on the screen.

Edit by selecting a value or inputting a value in the pop-up window.

Confirm your selection between each setting.

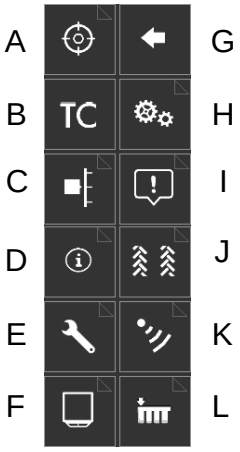

Figure 12.5

A. Menu for selection of calibration type,*"12.3 Calibration menu"* .
B. Activates Task Control and opens a settings submenu, *"12.2.4 Task Control"*.
C. Lift and output verification, *"12.3.7 Checking lift and output levels"*.
D. Information,*"12.2.9 Information"* .
E. Machine settings, *"12.2.3 Machine settings"*.
F. Device, *"6.6 Device"*.
G. Back.
H. General settings. Lights up green to indicate the current selection; *"12.2.2 General settings"*.
I. Alarm levels, *"12.2.5 Alarm levels"*.
J. Tramlining, *"6.3 Tramlining"*.
K. Calibrating the radar, *"12.2.6 Tramlining"*.
L. Setting row units; *"12.2.7 Row unit settings"*.

12.2.2 General settings

The precision seed drill always has basic factory settings with the correct machine type, size, et

Replacing the Gateway device that contains the machine's memory requires resetting the machine's basic settings

Figure 12.6 General settings products

The settings page can only be accessed when the machine is stationary. If a page in the menu is open, contact with the page will automatically be lost if the tractor is accelerated. *An exception applies to the radar, since calibration takes place while the tractor is running.*

For daily use no settings need to be entered in this menu.

A. Fertiliser output Off/ Normal/ FH (front hopper)
B. Microgranulate ON/OFF
C. BioDrill ON/OFF. [12]
D. Liquid fertiliser ON/OFF

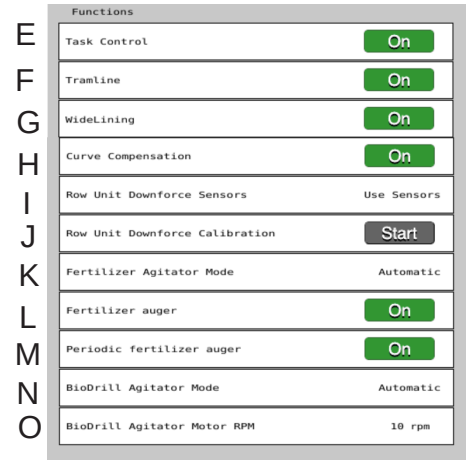

Figure 12.7 General settings functions

E. Task Control ON/OFF. While Task Control is enabled/disabled, a countdown will be displayed in place of ON/OFF.
F. Tramline ON/ OFF Output rate fertiliser AV/3m³/ 5m³ (only TPL and Central Fill).
G. If the machine is equipped with WideLining ON/OFF, this has to be marked. The output will then not be switched off for the row units that indicate tramlines and the row units will move laterally instead.
H. Curve compensation ON/OFF. Maintains same seed spacing on all rows at curves.
I. Row unit pressure in kilos is adjusted by pressing the +/- buttons on the operational settings page
J. Row unit downforce calibration
K. Fertiliser agitator mode

   ON: Electric motor/ hydraulic valve is always running/open

   OFF: Electric motor/ hydraulic valve is never running/open

   AUTOMATIC: Electric motor/hydraulic valve running/open when any of the fertiliser motors are running.
L. Output rate fertiliser AV/3m³/ 5m³ 18
M. Periodic auger, fertiliser ON/OFF
N. Biodrill agitator mode

   ON: Electric motor/ hydraulic valve is always running/open

   OFF: Electric motor/ hydraulic valve is never running/open

   AUTOMATIC: Electric motor/hydraulic valve running/open when any of the BioDrill motors are running.
O. BioDrill agitator speed. Only selectable with electric motor type.

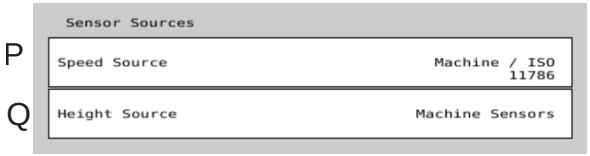

Figure 12.8 General settings sensors

P. Speed source
   - Radar on the machine or via ISO11786 connector
   - Ground speed (No Slip) via ISO11783 connector. [13]
   - Wheel-based speed (Slip) via ISO11783 connector. [14]

Q. Height source, machine sensors
   - Machine sensors
   - The height of the 3-point linkage via ISO11786 connector. [15]
   - The height of the 3-point linkage via ISO11783 connector. [15]

12. Only selectable on TPL and TPF.
13. Note that when selecting a speed from ISO11783, the tractor's terminal needs to be able to support the selected speed source.
14. Note that wheel-based speed can lead to reduced accuracy, depending on the amount of slippage that the tractor experiences when drilling.
15. Note that when selecting a height source from ISO11786/11783 connector, it is a requirement that the tractor is able to support this. Only selectable on TPR, TPT and TPV.

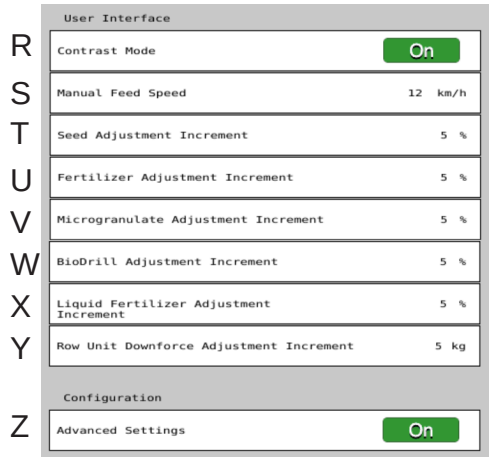

Figure 12.9 User interface

R. Contrast mode.

S. Manual feed speed. Speed to be used when using manual feed

T. Seed output percentage is adjusted by pressing the +/- buttons

U. Fertiliser output percentage is adjusted by pressing the +/- buttons

V. Microgranulate output percentage is adjusted by pressing the +/- buttons

W. BioDrill percentage is adjusted by pressing the +/- buttons

X. Liquid fertiliser output percentage is adjusted by pressing the +/- buttons

Y. Row unit pressure in kilos is adjusted by pressing the +/- buttons

Z. Advanced settings. Toggles accessibility to advanced settings ON/OFF

12.2.3 Machine settings

If a machine configuration needs to be done, keep in mind that an invalid machine configuration can damage the machine.

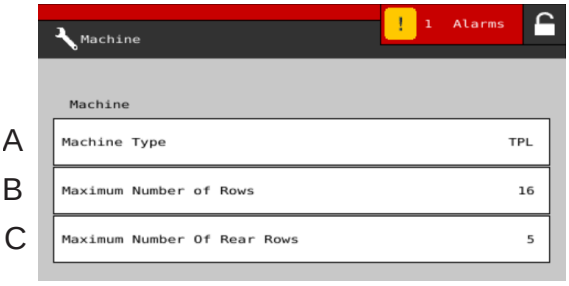

Figure 12.10 Machine settings

A. Selecting machine type. TPF, TPL, TPR, TPT or TPV.

B. Maximum number of rows

C. Maximum number of rear rows

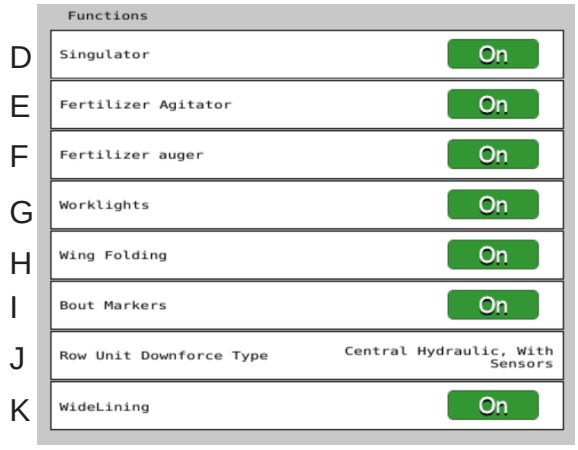

Figure 12.11 Machine settings functions

D. Singulator ON/OFF

E. Fertiliser Agitator ON/OFF

F. Fertiliser auger ON/OFF

G. Work lights ON/OFF

H. Wing folding ON/OFF

I. Bout markers ON/OFF

J. Row unit downforce Type

K. WideLining ON/OFF

Height detector type. This is displayed if the number of height detectors is 1. If two detectors are selected, a right and left detector type will be displayed.

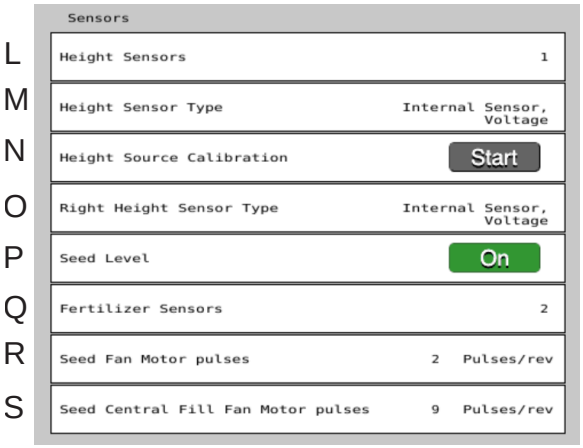

Figure 12.12 Machine settings sensors

L. Height sensor.

M. Height sensor type

This is displayed if the number of height detectors is 1. If two detectors are selected, a right and left detector type will be displayed

N. Height source collaboration

O. Right height sensor type. Only displayed when the number of height detectors is set to 2.

P. Setting of the number of level sensors for fertiliser (1/2)[16]

Q. Fertiliser sensors

16. Not selectable for TPL.

R. Seed fan motor pulses

S. Seed central fill fan motor pulses

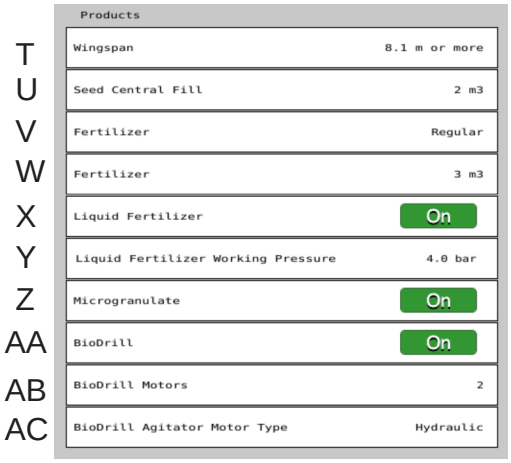

Figure 12.13

T. Wingspan (7.2m or less/ 8.1m or more

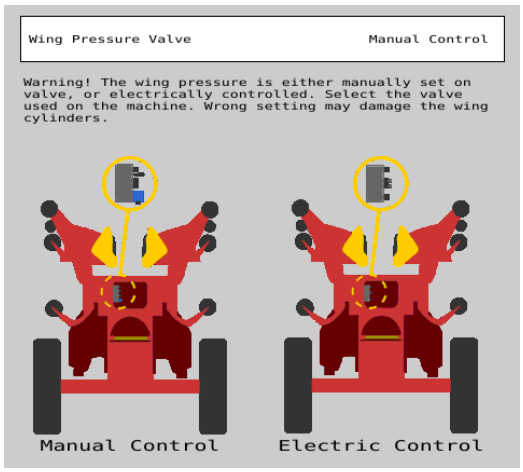

Figure 12.14

Setting wing pressure control. Manual or electronic wing pressure control is specified depending on the type of valve block mounted on the machine. Only selectable for TPL.

U. Seed central fill

V. Fertiliser Regular

W. Fertiliser 3 m3

X. Liquid fertiliser

Y. Liquid fertiliser working pressure

Z. Microgranulate

AABioDrill

ABBioDrill motors

ACBioDrill agitator motor type

Table 12.1

Seed output fan	Motor pulses
TPV, TPR, TPT, TPF (external sensor)	2
TPV, TPR, TPT, TPF (internal sensor)	9
TPL with 24 rows or more	5 (Parker piston engine) 7 (Bosch piston engine)
TPL med färre än 24 rader	9 (Bosch gear motor)

Table 12.2

Fertiliser fan	Motor pulses
TPL with 5 m³ fertiliser hopper	5 (Parker piston engine) 7 (Bosch piston engine)
TPL with 3 m³ fertiliser hopper	9 (Bosch gear motor)

Table 12.3

FH	Motorpulser
FH (external sensor)	2
FH (internal sensor)	9

12.2.4 Task Control

Task Control is a GPS-based help function to use in the field. A GPS terminal supporting this function is required for Task Control to work correctly. Contact your local GPS supplier to ensure that you have the correct functionality.

12.2.4.1 Main menu

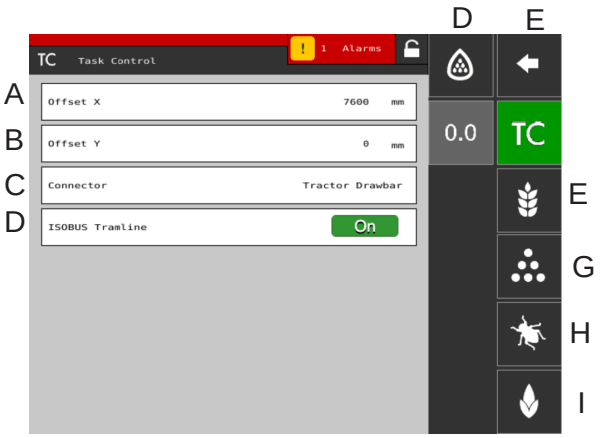

Figure 12.15

This is where information is entered regarding the geometric location of the drill in relation to the tractor.

A. Offset X = Distance between the hitching point and the ground contact point, e.g. gauge wheels and hitching point. Expressed in mm
B. Offset Y = Compensation for any canting. If the machine is pulling in one direction or if it is offset to one side. Expressed in mm.
C. Connector = Type of coupling device. Three point linkage or hitch
D. ISOBUS Tramline
E. Liquid fertiliser
F. Seed
G. Fertiliser
H. Microgranulate
I. BioDrill

12.2.4.2 Product-specific menus

Settings for sowing:

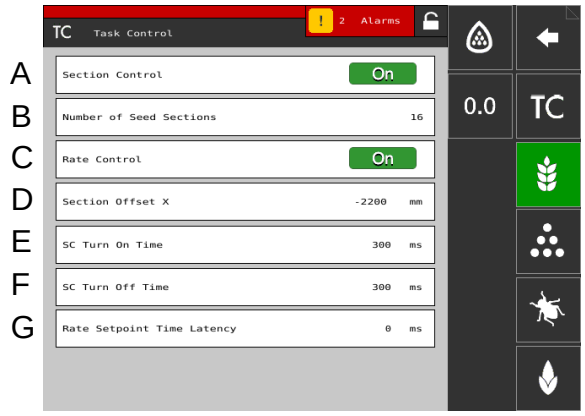

Figure 12.16

A. Shut-off by row
B. Number of sections = Maximum number of sections that are sent to the TaskControll screen. If this is exceeded, then several row units will share one section.

   Example: a 32-row machine with a maximum number of 16 sections installed, results in only 16 sections being reported on the screen.
C. Variable feed rate according to the control file ON/ OFF.
D. Section X = Distance between the ground contact point and the application point. This value together with the value in the field Offset Y is the same as the distance between the connecting device and the seed coulter. Expressed in mm.
E. SC Turn On Time = Time compensation for seed transportation (switch on)

   Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has stopped rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor stops rotating 0.3 seconds (300 ms) before the expected shut off
F. SC Turn Off Time = Time compensation for seed transportation (switch off)

   Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has stopped rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor stops rotating 0.3 seconds (300 ms) before the expected shut off
G. Time compensation when changing the variable rate. Example: If it takes 1.0 s (1000 ms) for the system to adjust the new rate, the setting will be 1000 ms.

Settings for fertiliser dispensing

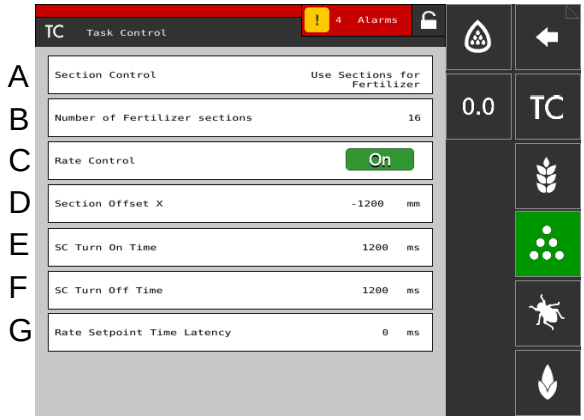

Figure 12.17

A. Shut-off by row, micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.

   Three options are possible:
   - Same as shut-off by row for sowing (A).
   - Specific shut-off by row for micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.
   - No shut-off by row
B. Number of sections, micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.
C. Variable feed rate according to the control file ON/ OFF.
D. Section X = Distance between the ground contact point and the application point

Offset is indicated by a positive value in the direction of travel. If the application point is located behind the gauge wheels, a negative value is set.

E. SC Turn On Time = Time compensation for seed transportation (switch on)

Example: If it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has begun rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor begins rotating 0.3 seconds (300ms) before the expected switch on. Units in this field should be entered in ms.

Units in this field should be entered in ms.

F. SC Turn Off Time = Time compensation for seed transportation (switch off)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has stopped rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor stops rotating 0.3 seconds (300 ms) before the expected shut off.

Units in this field should be entered in ms.

G. Time compensation when changing the variable rate. Example: If it takes 1.0 s (1000 ms) for the system to adjust the new rate, the setting will be 1000 ms.

Settings for micro-granulate:

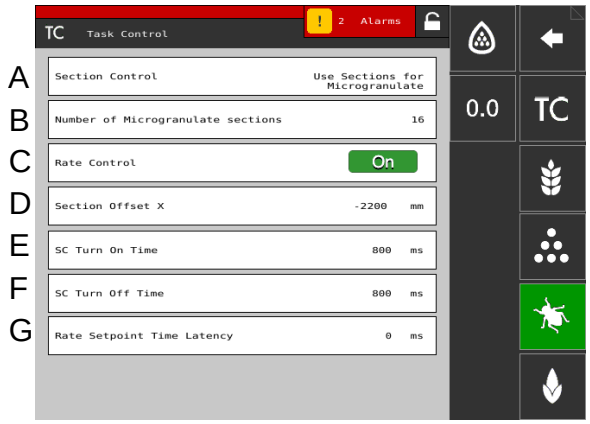

Figure 12.18

A. Shut-off by row, micro granulate/ BioDrill/ fertiliser/ liquid fertiliser

Three options are possible:

- Same as shut-off by row for sowing (A).
- Specific shut-off by row for micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.
- No shut-off by row

B. Number of sections, micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.

C. Variable feed rate according to the control file ON/ OFF.

D. Section X = Distance between the ground contact point and the application point

This value together with the value in the field Offset Y is the same as the distance from the coupling device to the seed coulter.

E. SC Turn On Time = Time compensation for seed transportation (switch on)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has begun rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor begins rotating 0.3 seconds (300ms) before the expected switch on. Units in this field should be entered in ms.

Units in this field should be entered in ms.

F. SC Turn Off Time = Time compensation for seed transportation (switch off)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has stopped rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor stops rotating 0.3 seconds (300 ms) before the expected shut off.

Units in this field should be entered in ms.

G. Time compensation when changing the variable rate. Example: If it takes 1.0 s (1000 ms) for the system to adjust the new rate, the setting will be 1000 ms..

Settings BioDrill:

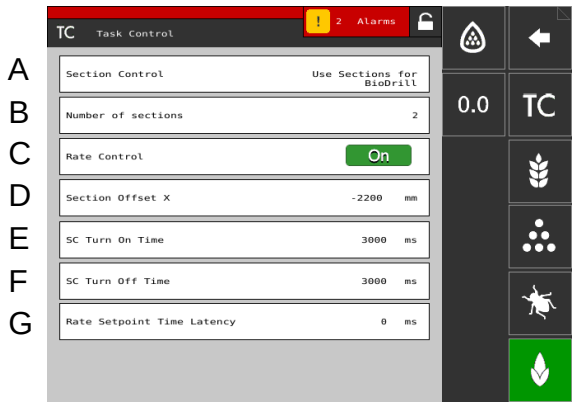

Figure 12.19

A. Shut-off by row, micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.

Three options are possible:

- Same as shut-off by row for sowing (A).
- Specific shut-off by row for micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.
- No shut-off by row

B. Number of sections, micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.

C. Variable feed rate according to the control file ON/ OFF.

D. Section X = Distance between the ground contact point and the application point

This value together with the value in the field Offset Y is the same as the distance from the coupling device to the seed coulter.

Offset is indicated by a positive value in the direction of travel. If the application point is located behind the gauge wheels, a negative value is set.

E. SC Turn Off Time = Time compensation for seed transportation (switch on)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has begun rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor begins rotating 0.3 seconds (300ms) before the expected switch on. Units in this field should be entered in ms.

Units in this field should be entered in ms.

F. SC Turn Off Time = Time compensation for seed transportation (switch off)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has stopped rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor stops rotating 0.3 seconds (300 ms) before the expected shut off.

Units in this field should be entered in ms.

G. Time compensation when changing the variable rate. Example: If it takes 1.0 s (1000 ms) for the system to adjust the new rate, the setting will be 1000 ms..

Liquid fertiliser settings:

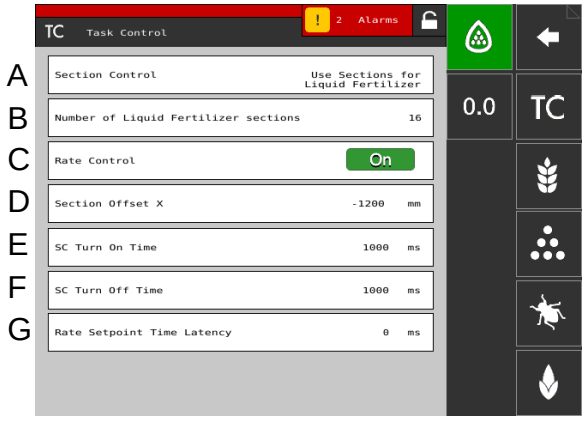

Figure 12.20

A. Shut-off by row, micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.

Three options are possible:

- Same as shut-off by row for sowing (A)
- Specific shut-off by row for micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.
- No shut-off by row

B. Number of sections, micro granulate/ BioDrill/ fertiliser/ liquid fertiliser.

C. Variable feed rate according to the control file ON/ OFF.

D. Section X = Distance between the ground contact point and the application point

This value together with the value in the field Offset Y is the same as the distance from the coupling device to the seed coulter.

Offset is indicated by a positive value in the direction of travel. If the application point is located behind the gauge wheels, a negative value is set.

E. SC Turn On Time = Time compensation for seed transportation (switch on)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has begun rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor begins rotating 0.3 seconds (300ms) before the expected switch on. Units in this field should be entered in ms.

Units in this field should be entered in ms.

F. SC Turn Off Time = Time compensation for seed transportation (switch off)

Example: if it takes 0.3 seconds (300 ms) for seeds to reach the seed coulter after the motor has stopped rotating, then the setting in this field should be 0.3 seconds (300 ms). This means that the motor stops rotating 0.3 seconds (300 ms) before the expected shut off

Units in this field should be entered in ms.

G. Time compensation when changing the variable rate. Example: If it takes 1.0 s (1000 ms) for the system to adjust the new rate, the setting will be 1000 ms.

12.2.5 Alarm levels

Alarm settings

Set the level at which alarms are to be activated. Change by pressing the field to be changed and set a new alarm level in the pop-up window

Alarm delay indicates the time between an error signal from the sensor and the visual/audible alarm on the home screen. The alarm indication should be slightly delayed to avoid alarms at low driving speeds. Nevertheless, the delay should be as short as possible so that sudden, brief interruptions can also be detected.

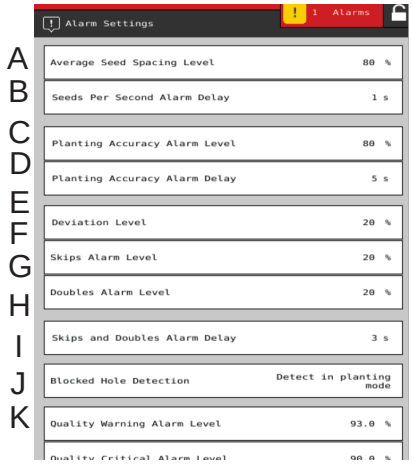

Figure 12.21

A. Alarm level for percentage deviation in the spacing between seeds on average for all row units.
B. Alarm delay (secs) for seeds per second.
C. Planting accuracy alarm level. Generates an alarm if the planting accuracy for one of the row units is less than the set alarm level
D. Alarm delay (sec) for planting accuracy. Basic setting: 5 seconds
E. Alarm level for percentage deviation in the spacing between seeds on average for all row units.
F. Alarm level for the number of skips within each row. Default setting: 20%
G. Alarm level for the number of doubles within each row. Default setting: 20%
H. Alarm delay (sec) for the number of skips and doubles.
I. Detection of a blocked hole. Select whether blocked holes should be detected in planting mode, in planting mode and seeding mode, or not detected at all
J. “Warning” alarm level for drilling quality. Drilling quality is the deviation percentage for skips and doubles together. Displayed as a bar chart on the statistics page (yellow marking if the accuracy is less than the set alarm level)
K. “Critical” alarm level for drilling quality. Drilling quality is the deviation percentage for skips and doubles together. Displayed as a bar chart on the statistics page (red marking if the accuracy is less than the set alarm level).

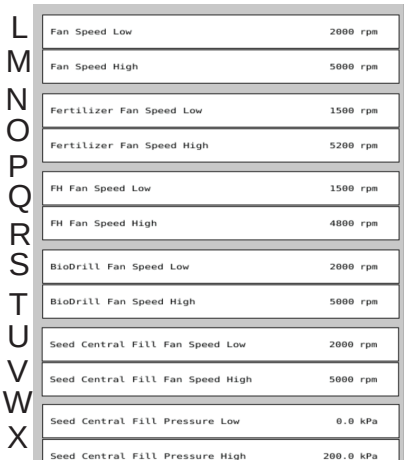

Figure 12.22

L. Fan rotation speed alarm level, lower alarm level. Default setting: 2,000 rpm.
M. Fan rotation speed alarm level, upper alarm level. Default setting: 5,000 rpm
N. Alarm level for fan speed, fertiliser, lower alarm level. Basic setting: 1500 rpm.
O. Alarm level for fan rotation, fertiliser, upper alarm level. Basic setting 5200 rpm.
P. Fan speed alarm level, FH 2200, lower alarm level. Basic setting: 1500 rpm.
Q. Fan speed alarm level, FH 2200, upper alarm level. Basic setting: 4800 rpm.
R. Fan speed alarm level, BioDrill, lower alarm level. Basic setting: 2000 rpm.
S. Fan speed alarm level, BioDrill, upper alarm level. Basic setting: 5000 rpm..
T. Fan speed alarm level, Central Fill, lower alarm level. Basic setting: 2000 rpm
U. Fan speed alarm level, Central Fill, upper alarm level. Basic setting: 5000 rpm..
V. System pressure alarm level, Central Fill, lower alarm level. Basic setting: 0 kPa.
W. System pressure alarm level, Central Fill, upper alarm level. Basic setting: 200 kPa.
X. Alarm level for low tank level, liquid fertiliser. Basic setting: 300 L.

12.2.6 Tramlining

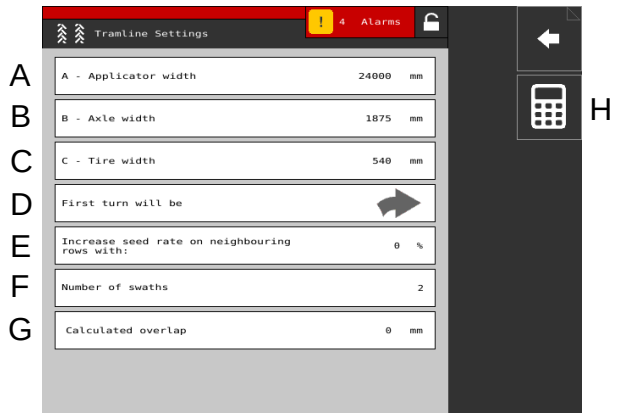

Figure 12.23

This screen is intended for calculation of tramlining.

The following values need to be entered:

A. Total width of the equipment
B. Distance between the set of wheels
C. Width of the wheels (safe clearance of the plants can be achieved by entering a higher value here.

   Example: the wheel width is 500 mm, but additional protection of 50 mm for the plant is desired – so 600 mm should be entered).
D. Also indicate which direction the tractor will turn after the first bout.
E. Tramlining Compensation is a function that allows you to vary the application rate using the tramline program. By entering a percentage in (E) all rows adjacent to a tramlining row will receive an increased application, according to the percentage entered.
F. Number of bouts
G. Number of overlaps
H. Starts calculation of rows and overlaps.

12.2.7 Row unit settings

For TPL, an extra row unit can be added. In which case, use an iPad to configure the row units

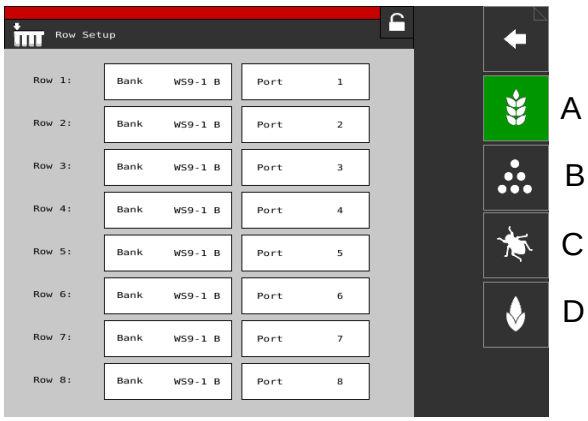

Figure 12.24

A warning is shown before you enter the settings menu. Do not change any settings in this menu if you are unsure. An incorrect value could cause a row unit to stop working.

Every motor on the seed unit, micro-granulate unit and fertiliser unit must be programmed to the correct motor output on WS9. All machines are programmed to the correct machine type at the factory, but new programming may be required in conjunction with software updates or WS9 replacement.

Adjustment

Select which unit is to be set using the function buttons (the symbol goes green). Change the value by pressing the field to be set and enter a new value in the pop-up window.

A. Seed motors
B. Fertiliser motors
C. Microgranulate motors
D. BioDrill motors

12.2.8 Row setup

A warning will be shown before you enter the settings menu: **Do not change any settings in this menu if you are unsure.** An incorrect value could cause a row unit to stop working.

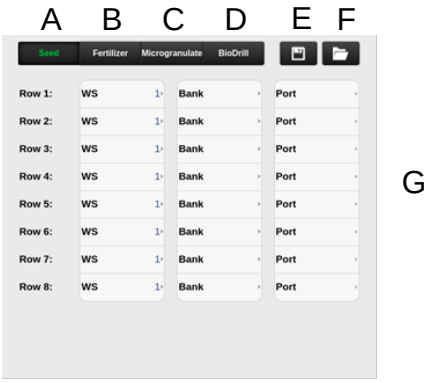

Figure 12.25

A. Seed motors
B. Fertiliser motors
C. Microgranulate motors
D. BioDrill motors
E. Save the row unit setting
F. Open a saved row unit setting
G. List of row units and their mapping

Every motor on the seed unit, micro-granulate unit and fertiliser unit must be programmed to the correct motor output on WS9. All machines are programmed to the correct machine type at the factory, but new programming may be required in conjunction with software updates or WS9 replacement..

Adjustment

Two outputs cannot have the same setting. If they do, this triggers a CAN bus communication error alarm.

1. Select which device is to be set using the function buttons (A), (B) (C) or (D);
2. The symbol for the selected row unit will turn green.
3. The list (F) for the selected unit is displayed.
4. Change the value by pressing the field to be set and enter a new value in the pop-up window. Settings must be made in accordance with

Save the setting

5. Click (E); to save current row unit setting. All devices (seed, fertiliser, micro granulate and BioDrill) are saved.

Figure 12.26

6. Enter a name/descriptor of your choice for the row unit setting.

Press to confirm.

Press to cancel.

Open a saved setting

7. Click (F); to open a saved row unit setting. All devices (seed, fertiliser, micro granulate and BioDrill) are opened..

Figure 12.27

8. Highlight a saved row unit setting. The name is highlighted in green

Press to open a row unit setting.

Press to delete a row unit setting.

Press to cancel opening a row unit setting.

12.2.9 Information

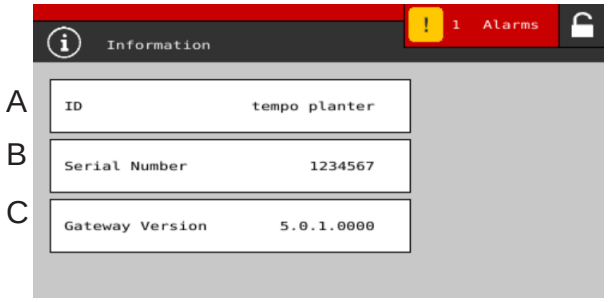

Figure 12.28

A. The name of the machine
B. The machine's serial number.
C. Gateway version

12.3 Calibration menu

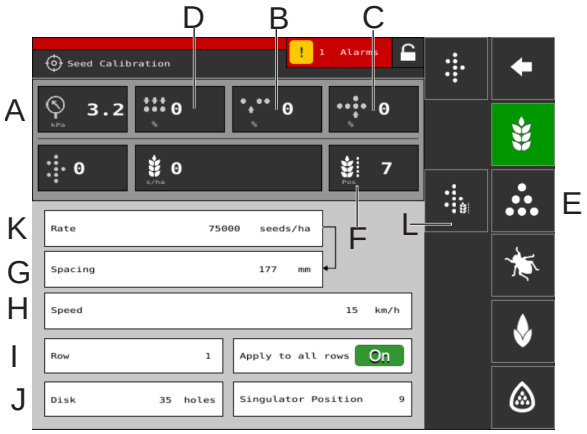

Figure 12.29

Select which unit is to be calibrated; active units are marked with a green symbol.

The calibration menu is described in a separate section for each product.

A. *"12.3.1 Calibration of the amount of delivered seed"*
B. *"12.3.2 Calibration of fertiliser"*
C. *"12.3.3 Calibration of micro-granulate"*
D. *"12.3.4 Calibration of BioDrill"*
E. *"12.3.5 Calibration of liquid fertiliser"*

12.3.1 Calibration of the amount of delivered seed

Go to calibration by selecting Settings/Calibration. Select seed.

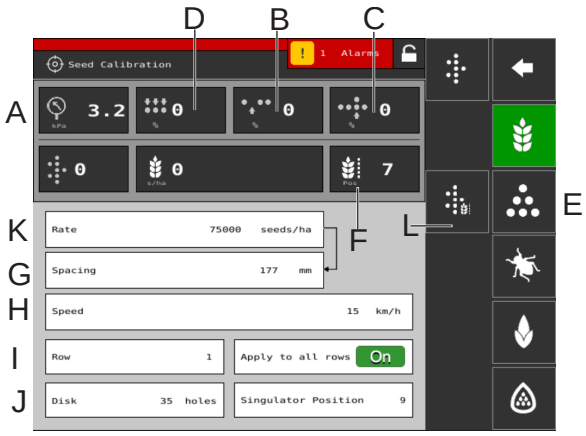

Figure 12.30

Display

A. Air pressure
B. Feed quality
C. Number of skips
D. Number of doubles
E. Feed for filling the feed system.
F. Number of seeds/ha or seed spacing (depending on calibration method).
G. If the calibration is to cover all row units, select ON.
H. Amount of seed
I. Select calibration method, specify number of seeds.
J. Select calibration method, specify distance between plants
K. If the expected driving speed is, e.g., 12 km/h, the calibration must be done for 12 km/.
L. Select which of the row units is to be calibrated.

Calibration menu settings (Values are displayed either in metric or imperial units, depending on which one has been selected in the general settings menu).

To choose the seed disc and settings for the metering unit, refer to the chapter "Drilling Recommendations" in the machine manual.

M. Set the required percentage increase/decrease rate in feed volume in the application rate field. If you select, for example, 5%, the application rate will change in increments of 5% every time the button is pressed in the operations menu.
N. Set the speed for which the machine is to be calibrated. If the expected driving speed is, for example, 12 km/h, the calibration must be done for a speed of 12 km/h.
O. Select which of the row units is to be calibrated (i.e. the row that has a calibration bag). If the calibration is to cover all row units, select ON (default setting).

   If calibration is to be carried out individually for only one row unit, select OFF.

P. Enter the number of holes on the seed disc installed in the seed feed housing.
Q. Select calibration method. Enter the spacing between plants in the upper row or the number of seeds in the lower row. (The selected calibration method is shown in the operations menu.)
R. Calibrate

Calibration

The calibration is normally carried out on one seed feed housing unit and the values are automatically carried over to the others. Check that there is seed in the seed hopper; the depth of seed should be at least 15 cm.

Check that there is seed in the seed hopper; the depth of seed should be at least 15 cm.

1. Position a calibration bag under the feed for the seed meter to be calibrated.
2. Position a calibration bag under the feed for the seed meter to be calibrated.
3. Enter the values in the calibration menu
4. Start the calibration with the button and hold it in until the indication for amount of seed delivered is showing at least 200.
5. Read off the proportion of skips and doubles . If any value is too high, adjust the singulator.
   - To reduce the proportion of **doubles, reduce** the singulator dial's set value.
   - To reduce the proportion of **skips, increase** the singulator dial's set value.

   Repeat points 4 to 5 until the required accuracy has been achieved.
6. You can exit the calibration menu using , or go directly to calibration of another unit
7. Remove the calibration bag and pour the seed back into the hopper.

12.3.2 Calibration of fertiliser

Go to the calibration menu by selecting Settings/ Calibration. Select fertiliser.

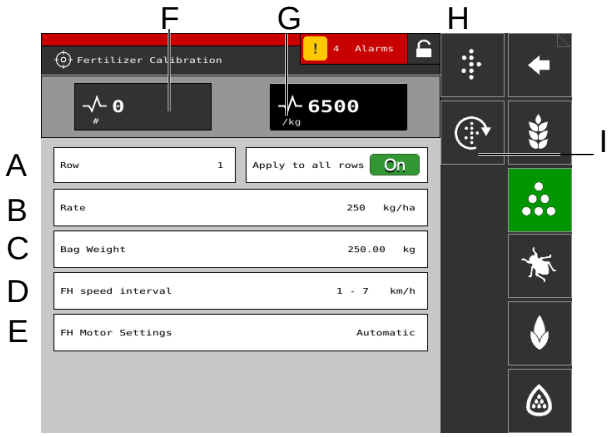

Figure 12.31

Calibration menu settings (Values are displayed either in metric or imperial units, depending on which one has been selected in the general settings menu).

A. Set value for the selected row unit or for all row units
B. Enter the desired feed rate
C. Enter the weight of the contents of the calibration bag filled during calibration
D. The appropriate interval for tractor speed
E. FH motor setup. Specify how to select the motors:
   - The motors are used automatically, one or both depending on what is selected (standard)
   - Choose to use only a specific motor (special)
F. Calculates pulses.
G. Calculates pulses/kg
H. Feed for filling the feed system.
I. Calibrate

Calibration

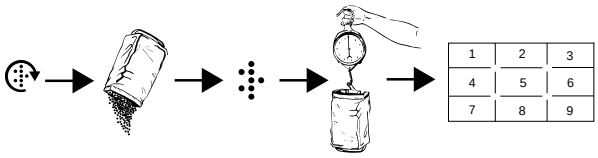

Figure 12.32

The calibration is normally carried out on one feed unit and the values are automatically carried over to the others. If desired, it is also possible to calibrate one feed unit individually.

Before calibration, check that there is a sufficient amount of fertiliser in the fertiliser hopper. The depth of fertiliser in the hopper should be at least 15 cm.

1. Set the feed units and select a feed roller so that it suits the actual fertiliser type.
2. Enter the values in the calibration menu.
3. Fill the feed system using the button.
4. Empty the calibration bag and put it back in place.

5. Select the calibration button and hold this button in until the right amount of fertiliser has been fed into the calibration bag. The pulses from the feed are displayed alongside the pulse symbol.
6. Weigh the contents of the calibration bag. Tip: First reset the scales with an empty calibration bag.
7. Enter the weight of the contents of the calibration bag in field (E) in the calibration menu. The number of pulses per kg will be automatically displayed in field (F).

   To enter the number of pulses manually, press field (F) and specify the number of pulses in the pop-up window. To cancel the calibration and perform a fresh calibration, repeat points 3 to 7.

8. You can exit the calibration menu using , or go directly to calibration of another unit.
9. Reset the calibration flaps to position B for drilling.

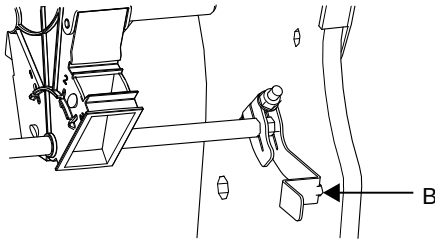

Figure 12.33

- Before drilling, ensure that the same type of feed roller is fitted to all feed units.
- Perform a new feed check in the field after drilling about a hectare.

Check regularly that deposits have not built up on the seed rollers and in the feed units.

12.3.3 Calibration of micro-granulate

Go to the calibration menu by selecting Settings/ Calibration. Select Microgranulate

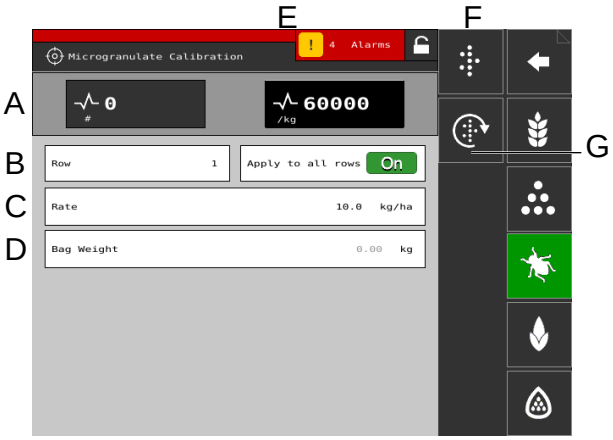

Figure 12.34

Display

A. Calculates the number of pulses.

Calibration menu settings (Values are displayed either in metric or imperial units, depending on which one has been selected in the general settings menu)

B. Select which of the feed units is to be calibrated (i.e. a row with a calibration bag). The position of the feed units is the same as that of the row unit.

   If the calibration is to cover all feed units, select ON (default setting). If the calibration is to be done individually for only one row unit, select A.

C. Enter the required micro-granulate application rate.
D. Enter the weight of the calibration bag contents.
E. Calculates pulses/kg. (You can also enter pulses/kg manually by pressing the row and entering the value in the pop-up window.)
F. Calibrate
G. Feed for filling the feed system

Calibration

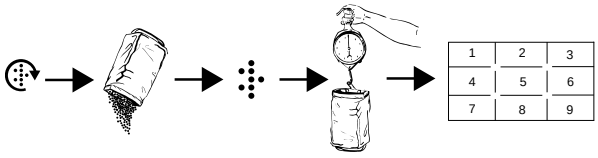

Figure 12.35

The calibration is normally carried out on one feed unit and the values are automatically carried over to the others. If desired, it is also possible to calibrate one feed unit individually.

Before calibration, check that there is a sufficient amount of fertiliser in the fertiliser hopper. The depth of fertiliser in the hopper should be at least 15 cm.

1. Set the feed units and select a feed roller so that it suits the actual fertiliser type.
2. Enter the values in the calibration menu.
3. Fill the output system using the button..
4. Empty the calibration bag and put it back in place.
5. Select the calibration button and hold this button in until the right amount of fertiliser has been fed into the calibration bag. The pulses from the feed are displayed alongside the pulse symbol.
6. Weigh the contents of the calibration bag. Tip: First reset the scales with an empty calibration bag.

7. Enter the weight of the calibration bag contents in field (D) in the calibration menu. The number of pulses per kg will automatically be displayed in field (E).

   To enter the number of pulses manually, press field (E) and key in the number in the pop-up window. To cancel the calibration and perform a fresh calibration, repeat points 3 to 7.

8. You can exit the calibration menu using , or go directly to calibration of another unit.

- Before drilling, ensure that the same type of feed roller is fitted to all feed units.
- Perform a new feed check in the field after drilling about a hectare.

Check regularly that deposits have not built up on the seed rollers and in the feed units.

12.3.4 Calibration of BioDrill

Go to the calibration menu by selecting Settings/ Calibration. Select BioDrill.

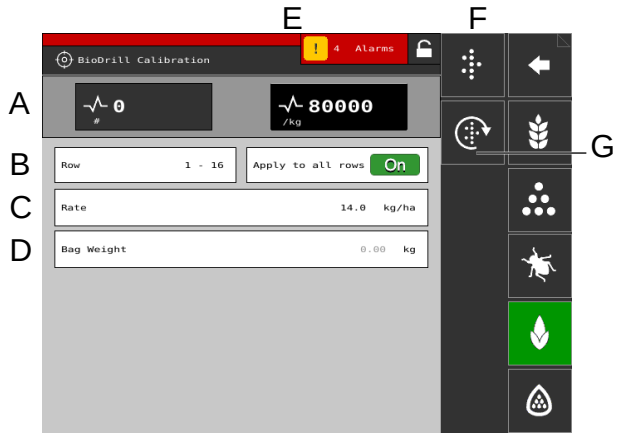

Figure 12.36

Display

A. Calculates the number of pulses

Calibration menu settings (Values are displayed either in metric or imperial units, depending on which one has been selected in the general settings menu)..

B. Select which of the feed units is to be calibrated (i.e. a row with a calibration bag). The position of the feed units is the same as that of the row unit.

   If the calibration is to cover all feed units, select ON (default setting). If the calibration is to be done individually for only one row unit, select A.

C. Enter the desired BioDrill rate.

D. Enter the weight of the calibration bag contents

E. Calculates pulses/kg. (You can also enter pulses/kg manually by pressing the row and entering the value in the pop-up window.)

F. Calibrate

G. Feed for filling the feed system.

Calibration

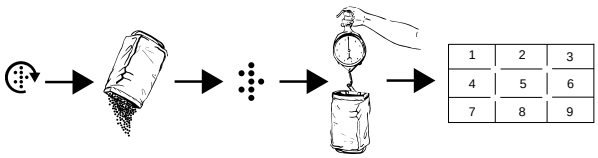

Figure 12.37

The calibration is normally carried out on one feed unit and the values are automatically carried over to the others. If desired, it is also possible to calibrate one feed unit individually.

Before calibration, check that there is a sufficient amount of fertiliser in the fertiliser hopper. The depth of fertiliser in the hopper should be at least 15 cm.

1. Set the feed units and select a feed roller so that it suits the actual fertiliser type.

2. Enter the values in the calibration menu.

3. Fill the output system using the button.

4. Empty the calibration bag and put it back in place.

5. Select the calibration button and hold this button in until the right amount of fertiliser has been fed into the calibration bag. The pulses from the feed are displayed alongside the pulse symbol.

6. Weigh the contents of the calibration bag. Tip: First reset the scales with an empty calibration bag.

7. Enter the weight of the calibration bag contents in field (D) in the calibration menu. The number of pulses per kg will automatically be displayed in field (E).

   To enter the number of pulses manually, press field (E) and key in the number in the pop-up window. To cancel the calibration and perform a fresh calibration, repeat points 3 to 7.

8. You can exit the calibration menu using , or go directly to calibration of another unit.

- Before drilling, ensure that the same type of feed roller is fitted to all feed units.
- Perform a new feed check in the field after drilling about a hectare.

Check regularly that deposits have not built up on the seed rollers and in the feed units..

12.3.5 Calibration of liquid fertiliser

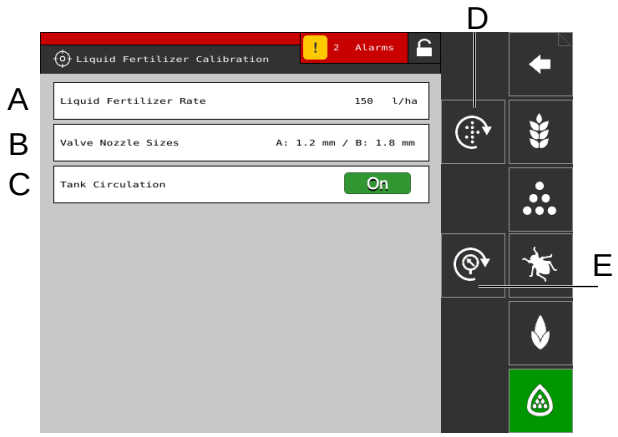

Figure 12.38

A. Enter the desired feed rate
B. Select the nozzle size for the mounted valve A/B
C. If the liquid fertiliser is to be circulated back to the tank, select ON. If the liquid is only to be circulated back to the pump, select OFF.
D. Output to fill and pressurise the output system in working mode.
E. Resetting the pressure control valve in working mode

12.3.6 Calibrate the radar

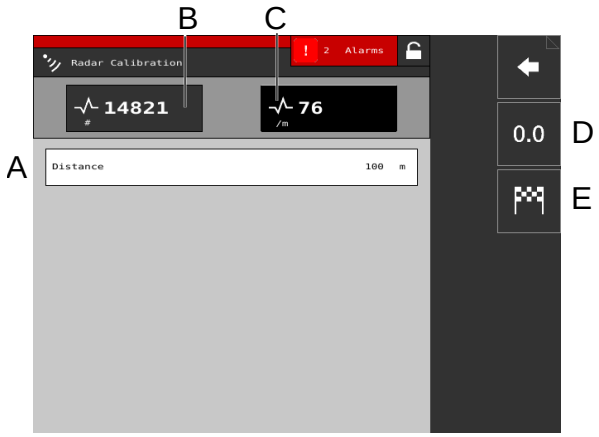

Figure 12.39

Fields on the screen:

A. Field to enter the distance driven when calibrating
B. Displays the total number of radar pulses whilst operating.
C. Displays the calibration result as the number of radar pulses/ m.
D. Resets the number of radar pulses and starts pulse counting.
E. Stops pulse counting, saves the number of radar pulses and calculates the calibration result in field C.

Calibration

1. Measure a specific distance (at least 100 m).
2. Press (A) at the starting point to reset the pulse counter.
3. Drive the selected distance with the machine lowered to the drilling position and press (B) at the stop point.
4. Press the field (E) and enter the distance driven in metres.
5. Press button (C). Number of pulses per metre driven is calculated and automatically updated in field (F).

12.3.7 Checking lift and output levels

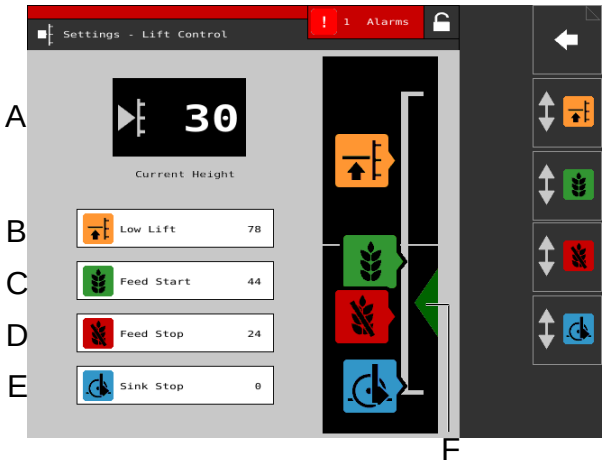

Figure 12.40

Settings

Setting the level for the drilling position (TPF) and the LowLift position (TPF and TPL), as well as setting the levels for output start and output stop.

For TPT, TPV and TPR, the setting is only available if the tractor provides the height of the 3 point linkage via the ISO11786 connector or the ISO11783 connector. See Height Source in Chapter *"12.2.3 Machine settings"*.

A. **Lift height** The machine's momentary height.
B. **LowLift** The set value is a percentage of the level for a fully raised machine, which is 100. The maximum LowLift level for TPL is 20.
C. **Feed start**The level at which the seed meter begins feeding out seed when the machine is lowered into the drilling position. The default values are the relative current values for the LowLift and drilling positions (for the machines where they are available). If the LowLift or drilling positions are changed, the output start level will also be adjusted.
D. **Feed stop** The level at which the seed meter stops feeding out seed when the machine is raised to the LowLift position. The default values are the relative current values for the LowLift and drilling positions (for the machines where they are available). If the LowLift or drilling positions are changed, the output start level will also be adjusted.
E. **Drilling position**

F. **Indicator arrows**

The drilling position should not be changed when feed start, feed stop or LowLift are set! The setting is made during basic machine setup.

(The drilling depth is set individually for each row unit.)

Adjustment

1. Press the button for the function to be set in the field with the height scale. You can also press the corresponding function button.
2. Raise or lower the drill unit to the desired position using the hydraulic lever. The indicator arrow (F) follows the drill unit's movement along the height scale.
3. Confirm your value between each setting.

- If you know in advance which value is to be set, this can be done by pressing the field which shows the value for the function you want to change. Enter the value in the pop-up window and confirm.

and can never be higher than or lower than .

can never be higher than .

12.4 Operational settings

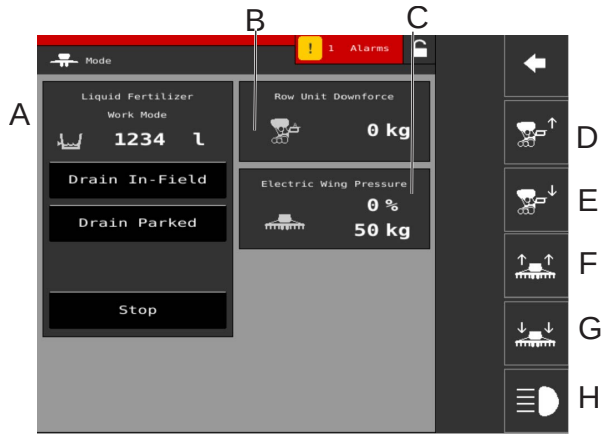

Figure 12.41

Operational settings are available in the following instances:

- On machines with hydraulic row unit pressure
- When the FH 2200 front hopper is used.

A. Liquid fertiliser, fill mode. For information on other modes, see *"8.1 Liquid fertiliser operations (only TPL with liquid fertiliser)"*
B. Current row unit pressure.[17]
C. Current wing pressure and difference in percentage points compared to hydraulic row unit pressure. [18]
D. Reduces the row unit pressure
E. Increases the row unit pressure
F. Reduces the wing pressure
G. Increases the wing pressure
H. Front hopper work lights Turn work lights ON/OFF on the FH 2200. Only available when the FH 2200 fertiliser option is activated.

12.5 Device Setup

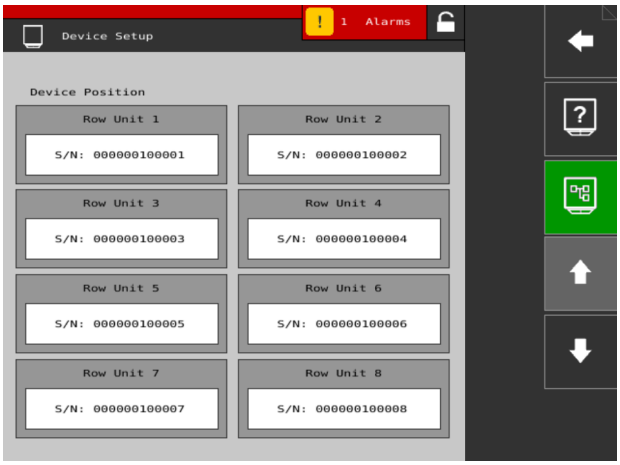

Figure 12.42

12.6 Unit

Row unit positioning does not normally need to be performed unless an existing WorkStation device is replaced. In that case, the new WorkStation device should be placed on its new row unit.

17. Only available on TPF and TPL equipped with hydraulic row unit pressure.
18. Only available on TPL with software controlled wing pressure control.

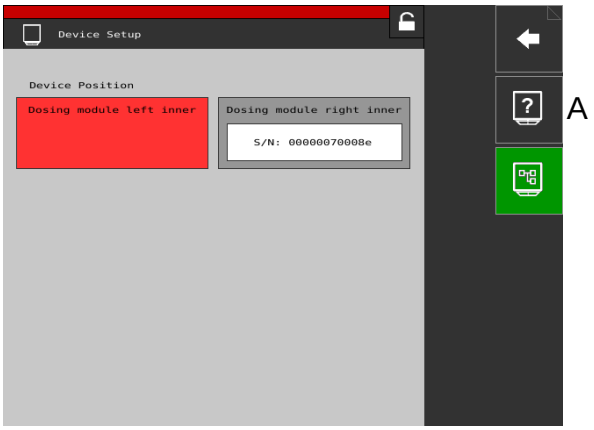

Figure 12.43

A. Unconfigured units.

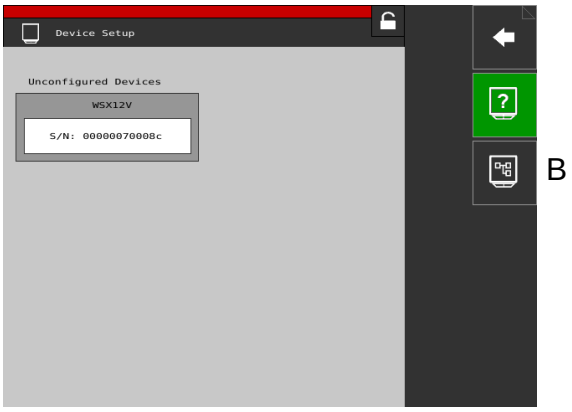

Figure 12.44

B. Device positioning: all row units should be connected to a WorkStation device.

12.7 Statistics

Go to the statistics menu by pressing the statistics field.

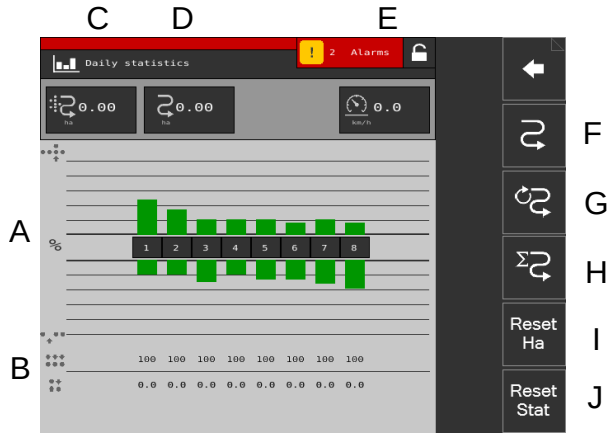

Figure 12.45

Operation statistics

The operations statistics menu shows statistics for the current drilling operation, for the current season and for the total service life of the seed drill.

Depending on whether the machine is equipped with a seed disc with fewer or more than 70 holes, what is displayed will be either skips/doubles or the percentage deviation from the specified feed rate

Times are only recorded for when some type of sowing activity is in progress.

A. Average number of skips and doubles for the current drilling operation and season
B. Average distance between seeds or seeds per hectare
C. Area sown
D. Area driven
E. Average speed
F. Selection of time interval: Current drilling operation
G. Selection of time interval: Season
H. Selection of time interval: Total
I. Resets the numbers for hectares
J. Reset statistics for current drilling operation and season (data in the grey box). Statistics for total service life cannot be reset.

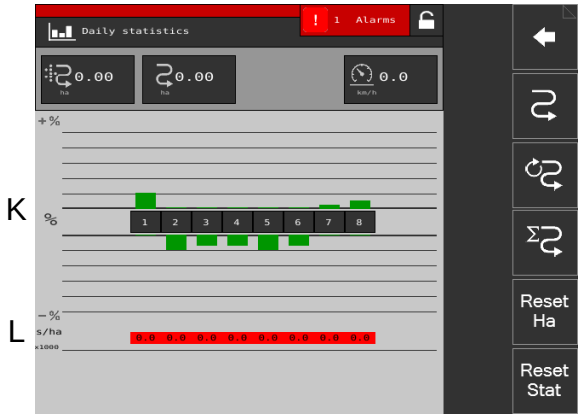

Figure 12.46

K. Percentage deviation from the specified feed rate
L. Average distance between seeds or seeds per hectare..

12.8 Alarms

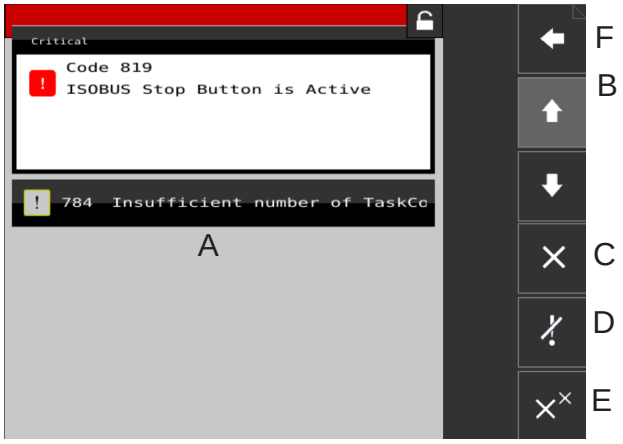

Figure 12.47

When an alarm is triggered, an audible signal will be emitted and the alarm will be displayed visually on the home screen.

Enter the alarms menu by pressing the alarm symbol. The nature of the alarm is described directly on the screen

If an alarm relates to one or more specific row units, all the row units are displayed as a line of numbered blocks where the row unit(s) indicating alarms are shown in a different colour.

Remedy the fault(s) that caused the alarm(s) and acknowledge one alarm at a time or all the alarms at once.

If there are critical alarms, they must all be acknowledged before restarting WS9.

A. Go to the home screen
B. Move UP the list of alarms.
C. Move DOWN the list of alarms.
D. Acknowledge individual alarms
E. Acknowledge all alarms.

In section *"18 Alarm list, ISOBUS/E-Control"* all alarms are described with the suggested action required

Alarm levels

If a critical alarm is triggered, the feed on all units stops. The error condition must be dealt with and the alarm acknowledged before the feed is restarted.

- **Yellow** marking means **Warning**. .

  Operation of the machine may continue, but the error condition should be remedied as quickly as possible.
- **Red** marking means **Critical**.
- The alarm levels are set in the alarms menu under settings; see *"12.2.5 Alarm levels"*.

13 Use in the field

13.1 Manual feed

 Tap the field in the work display to select the function.

Green symbol = feed output enabled. Hold in the button so that feeding occurs without the machine driving forwards. Used when starting at a corner, for example, or during output verification

White symbol = feed output disabled

Standard selection for which driving speed feed output is adjusted is made in the basic settings menu, see *"6.1 General machine settings"*

13.2 Wing folding

To unfold the wings, the iPad must be plugged in to a power cable[19]

 Press on the field in the work display to select the function

Wing folding opens the wing folding valve from transportation to field. **Only applicable to Tempo F**

13.3 Transport position

 Press on the field in the work display to select the function. Transport position enables switching from work position to transport position. **Only applicable to Tempo F.**

Press on the field in the work display to select function. Leaving transport position enables switching from work position to transport position. **Only applicable to Tempo F.**

13.4 LowLift

 Tap the field in the work display to select the function

Green symbol = Used e.g. for headlands when you want to raise the row units and stop feeding without needing to raise the machine more than necessary

White symbol = HighLift/LowLift disabled.

13.5 Lift stop

 Tap the field in the work display to select the function.

White symbol = lift stop disabled.

After 30 seconds, the lift stop will be disabled automatically.

13.6 Auto advance

 Press on the field in the work display to select the function

Green symbol = auto advance activated. Auto advance is used during normal driving. The tramlining cycle advances when the machine is lifted and lowered.

White symbol = auto advance disabled. Used to lift the machine in a bout without advancing the tramlining cycle.

13.7 Bout marker switching

 Tap the field in the work display to select the function.

Green symbol = automatic bout marker switching. During normal driving, automatic bout marker switching is used. The bout marker switches when the machine is lifted and lowered. Advance bout marking with  .

White symbol = manual bout marker switching.

Applies only to Tempo F The bout markers are always folded in when the machine is lifted, regardless of the indication on the home screen. This is also the case if the terminal is switched off.

These are the possible choices:

- both bout markers retracted
- right bout marker extended
- left bout marker extended
- both bout markers extended

Advance bout marking with  .

19. Only applies only to TPF.

13.8 FrontHopper activation

Press on the field in the work display to select function.

When the FrontHopper is used for fertiliser output, switching on and off can be controlled in one of the following three ways:

- Via the symbol for FrontHopper on the homepage.
- Via hydraulic ON coupled to one of the tractor's hydraulic valves, if the hydraulic switch is connected.
- Via TaskControl, if this is used.

The other options that are **not** used must always remain enabled.

13.9 Tramline programs

It is possible to manually select the bouts in the tramline program. It may be necessary to do so, such as in cases where there are irregular fields, for example.

For more information on tramlining, see *"6.3 Tramlining"*.

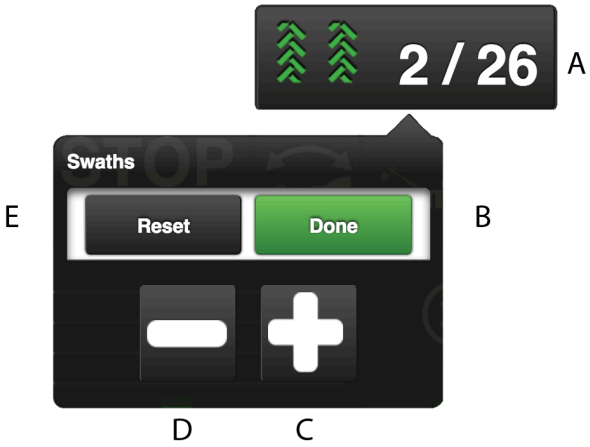

Figure 13.1

1. Press the display field for bouts (A) at the top right of the home screen. A pop-up window will appear.
2. Use the plus or minus keys (C) and (D) to scroll through the tramlining program.
3. Return to the first pass of the tramlining program using the (E) key.
4. Conform your selection with (B).

13.10 Variable adjustable application rate

13.10.1 E-Control

The application rate is adjusted through a pop-up window directly on the home screen where it is possible to select a percentage change (the example in the screenshot shows the setting for the amount of seed delivered).

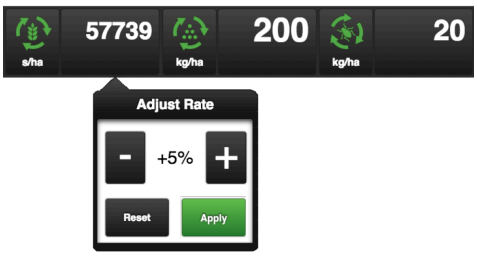

Figure 13.2

Open the pop-up window by pressing on the field for the seed application rate. Adjust the control to the desired change. 0% means no change. The percentage change is recorded in the calibration menu.

13.10.2 Virtual Terminal (ISOBUS)

The application rate is adjusted through a pop-up window directly on the home screen where it is possible to select a percentage change (the example in the screenshot shows the setting for the amount of seed delivered). The percentage change is recorded in the calibration menu.

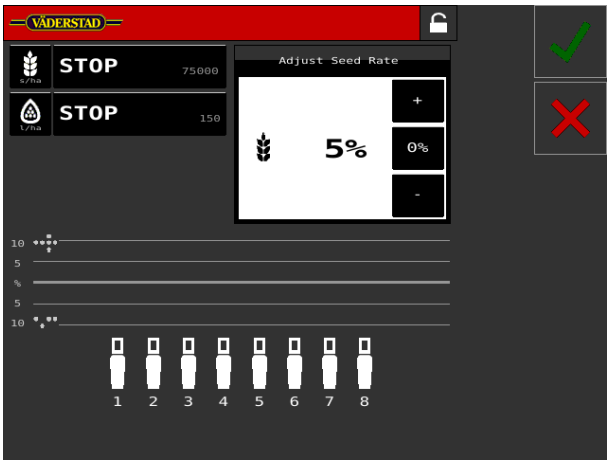

Figure 13.3

Open the pop-up window by pressing the field for the seed application rate.

Close the window by pressing the same field that opened the window.

 increases the application rate in accordance with the selection in calibration.

 reduces the feed rate, in accordance with the selection in the calibration.

resets to zero.

14 Task Control parameters

Task Control settings

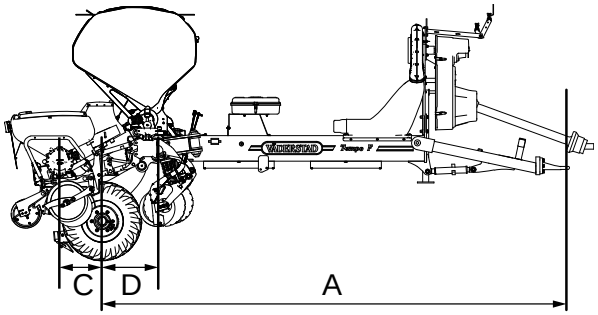

Figure 14.1

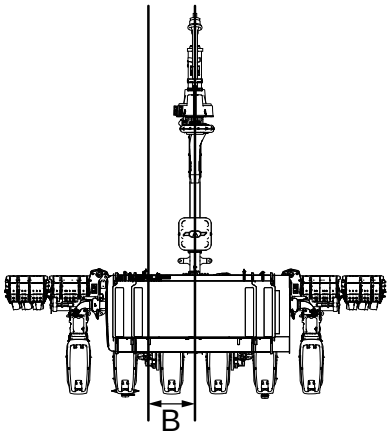

Figure 14.2

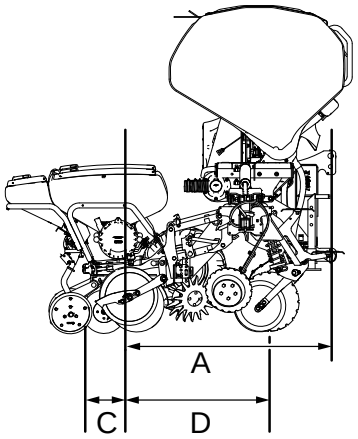

Figure 14.3

A	Coupling offset Y:	The distance from the connection point to the ground contact point, measured in mm.
B	Coupling offset X	The distance between the tractor's coupling point and the centre of the machine, measured in mm. The "positive" direction is to the right of the machine's direction of travel. That is to say, that if the machine has an offset to the right of the tractor, the value should be positive and if the machine has an offset to the left of the tractor, the value should be negative. Example: If the machine is going 3 cm to the right of the tractor, key-in 30 (mm) and if the machine is going 1 cm to the left of the tractor, key-in -10 (mm)
C	Seed and micro granulate section Y	The distance between the ground contact point and the seed coulters, measured in mm. Note, that if the seed coulters are positioned in front of the ground contact point, the value should be negative.
D	Fertiliser section Y:	This parameter is only used if the has been selected and is being controlled by TC.

	A	C	D
TPF	4600	350	-580
TPL	5123[20]/ 6600[21]	2200	1200
TPR	1200	0	-860
TPR[22]	1400	0	-860
TPT	1400	0	-860
TPV	1300	0	-860

20. short frame
21. long frame
22. 3m frame with 4 or 6 rows.

Section ON/OFF times

When the motors start or stop, there will be delays in the system, due to, for example, electrical signals and the fact that it takes a certain amount of time for the product to be transported before it reaches the ground. To compensate for this, you can specify turn-on and turn-off times.

SC on time The time it takes from when a motor starts up to when the product reaches the ground, measured in ms (milliseconds). This means that 1 second will be entered as 1000 (ms), and 1.75 seconds as 1750 (ms).

SC off time The time it takes from when a motor stops to when the product ceases to be delivered, measured in ms (milliseconds). This means that 1 second will be entered as 1000 (ms), and 1.75 seconds as 1750 (ms).

	Time for fertiliser	Time for seed	Time for micrograNulate
TPF	1000	300	800
TPL	1200	300	800
TPR	1000	300	800
TPR[23]	1000	300	800
TPT	1000	300	800
TPV	2500	300	800

Note that the above values should only be considered as guidelines and may need to be adjusted on site according to prevailing conditions

23. 3m frame with 4 or 6 rows.

15 Wing folding

15.1 Wing folding guide

To unfold the wings, the iPad must be plugged in to a power cable[24]

The wing folding guide should be started on the iPad and Virtual Terminal for machines featuring Central Fill and a 2m³ seed hopper when unfolding and folding the machine

The wing folding guide is a picture-based guide that can be interrupted by pressing Close.

When unfolding a machine featuring Central Fill and a 2m³ seed hopper and the height goes below a predetermined height setting, a warning will be displayed to ensure that the telescopic support wheel is recessed. This warning will disappear if the height increases. The same warning will be displayed when folding up the machine.

15.2 Hydraulic wing folding – TPF

15.2.1 Switching between transport and work position

Switching between transport position and working position must take place on level ground with an even surface.

The basic model of the machine is adjusted manually. It can be adjusted hydraulically using optional equipment.

If the machine is in work position when the terminal is started, press to display the home screen.

Figure 15.1

If the machine is in the transport position when the terminal is started, the position for wing folding is displayed; see the figure above. Fold out the wings as follows

1. Press the wing folding button for three seconds. The transportation mode button is displayed.
2. Fold out the wing sections manually or with the hydraulic lever for wing folding. The home screen button is displayed.
3. Press the home screen button.

15.2.1.1 Switching between transport position and working position

The machine must not rest on safety catches during transportation.

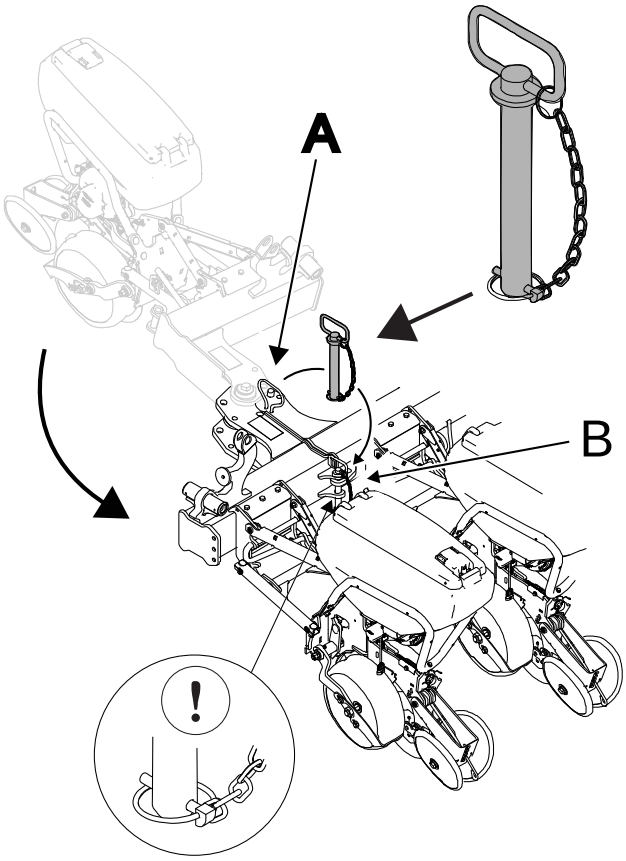

Figure 15.2

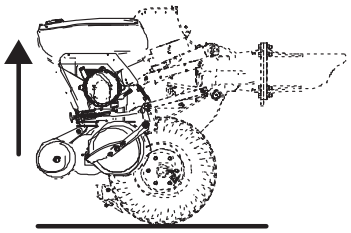

Figure 15.3

1. Lift up the machine so that it moves free of the ground and start the terminal.
2. Release the locking pin from position (A).

   If the machine is equipped with hydraulic wing folding, undo the pin (A) on both sides.

24. Only applies only to TPF.

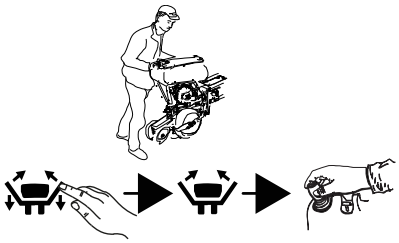

Figure 15.4

3. If the machine is equipped with hydraulic wing folding, press the wing folding button for three seconds so that the symbol for transportation mode is shown. Fold out the wing sections with the tractor's hydraulic lever. Once the wing sections are fully folded out, the home screen button is displayed

4. Press the home screen button.

5. Lock both the wing sections in the folded out position with the locking pins in position (B).

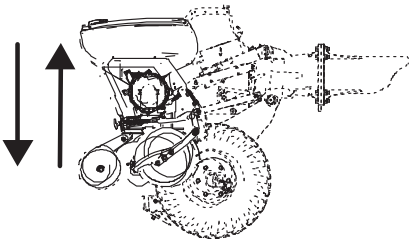

Figure 15.5

6. .Raise the machine to its topmost position. Keep the hydraulic lever in this position with the tractor idling until all movement has stopped in order to synchronise the lifting cylinders of the wheels. The cylinders allow seepage when in their top and bottom positions so that the oil can overflow through the system and expel any air. Always repeat this when hitching the tractor, before adjusting the machine and several times during the working day.

   – If the machine is equipped with support wheels (applies to TPF8) first lower the machine to the working position in order to open the hydraulic valve for the support wheels.

15.2.1.2 Switching from working position to transport position

The machine must not rest on safety catches during transportation.

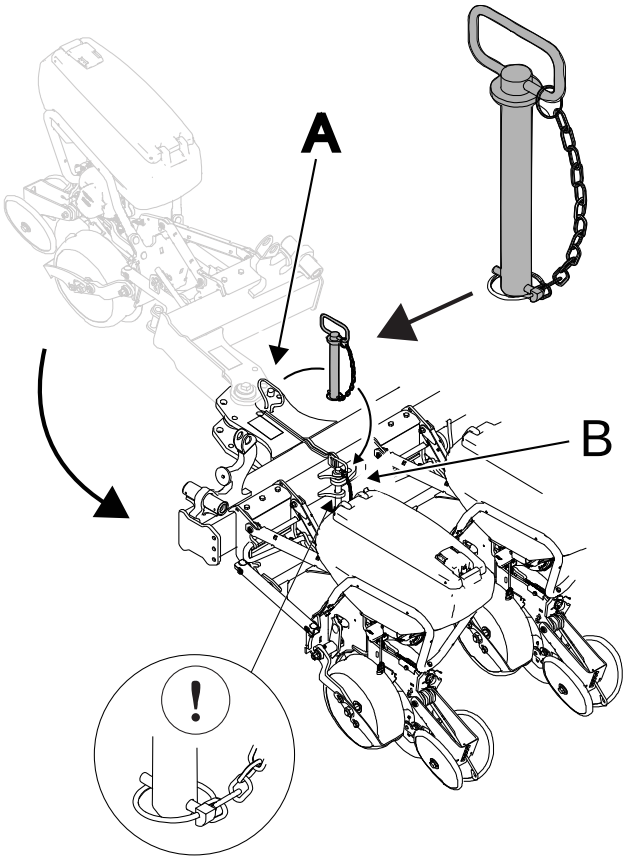

Figure 15.6

1. OFF Switch off the fan.

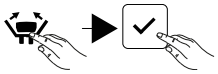

Figure 15.7

2. Press the transport position button and confirm your selection.

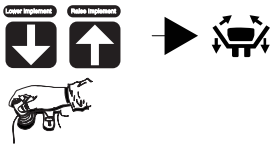

Figure 15.8

3. Follow the on-screen instructions for raising and lowering. Once the machine is fully raised, the wing folding button is shown.

4. Loosen the sprint from position (B).

   If the machine is equipped with hydraulic wing folding, undo the pin (B) on both sides.

If the pins are tight: press the button for 3 seconds and adjust with the hydraulic lever to release the pressure on the pin

Figure 15.9

5. Rotate the wing section by hand into the transportation position.

   If the machine is equipped with hydraulic wing folding, turn the wings to the transport position using the hydraulic lever for wing folding.

6.  Lock the wings in the retracted position with the locking pins in position (A) on both sides

16 Electrical components

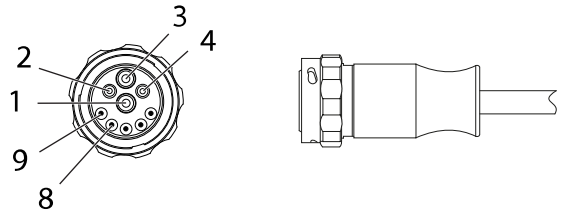

Figure 16.1 ISO111783

16.1 ISO11783 Power supply, Gateway

Tine	Function
1	Electrical earthing
2	Electrical control unit, earthing
3	Voltage 12 V
4	Electrical control unit 12 V
8	CAN high
9	CAN low

16.2 ISO11786 Speed/Lift position

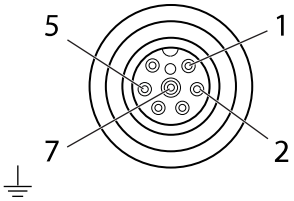

Figure 16.2 ISO111786

Tine	Function
1	Speed Radar, No Slip
2	Speed Drive Wheels, Slip
5	Lift position 3-point
7	Electrical earthing

17 Troubleshooting

17.1 General information on troubleshooting

Electrical, hydraulic and mechanical components are used to control the machine. Work methodically and, step by step, eliminate possible sources of error using the troubleshooting page.

Refer to the troubleshooting chapter in the machine’s instruction manual.

17.2 Troubleshooting list

Critical alarms should always be investigated so that the basic reason for the alarm can be remedied.

Critical alarms on a fertiliser or microgranulate motor can lead to repeated stoppages of the entire output.	Given that the entire machine output is stopped . Whenever an alarm arises in relation to a single fertiliser or microgranulate motor, it may be necessary to temporarily fix the problem by setting the feed rate for the offending row to zero. Check the feed and clean if a blockage has occurred

18 Alarm list, ISOBUS/E-Control

Under “Device Information” on the Information page you can see “Detailed information” about the existing devices on your machine. This detailed information is a good way to help you determine what could be wrong on the machine whenever an alarm appear. Go to the detailed information for the device (row unit) presented by the alarm or the one handling the specific function the alarm is referring to. The five different connectors holds information about the different features position and their actual values such as PWM, voltage, current etc. If the values are not updated correctly, it could be a good idea to check if the feature is actually positioned on this connector on the machine and if the cable is intact.

0 Fault in connection of UI and Gateway	Contact lost between iPad and Gateway. Check Wi-Fi connection.
1. Fault in connection of UI and Gateway	Contact lost between iPad and Gateway. Check Wi-Fi connection.
2. CANBUS error	Gateway has lost contact with WorkStation. Check the CANBUS cabling between Gateway and WorkStation.
28. Fan speed too high	The fan’s speed is higher than the set *upper* alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels.
29. Fan speed too low	The fan’s speed is lower than the set *lower* alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels. Check the rotation speed sensor cable, connectors and connections. Check the sensor’s functionality by rotating the fan wheel manually and checking the diode on the sensor. The diode should light up when the pin on the fan shaft passes the sensor. The gap between the sensor and the pin should be between 1 and 2 mm. Adjust if necessary. An illuminated diode is no guarantee that the sensor is working properly. If the alarm appears only occasionally, this is probably because the sensor is either incorrectly adjusted or defective. Check the PTO system’s flow valve setting (if PTO installed). PTO shaft is rotating (if PTO installed).
30. Feed stop	Level for low lift or low stop has not been reached within the preset time limit. Time limit 10 seconds.
31. Blocked hole in seed disc in seed meter	One or more holes in the seed disc are clogged. Check the seed disc and remove seeds or seed residue that have got stuck.
40. Seed spacing	The amount of seed/hectare, or the number of mm between seed/hectare deviates by more than the set value on a given row, or the entire machine. The reference value is the set value in the programming menu.
43. Seeds per second	The amount of seed/hectare, or the number of mm between seed/hectare deviates by more than the set value on a given row, or the entire machine. The reference value is the value input in the programming menu
44. Sowing quality (planting accuracy)	The planting accuracy is below the set limit.

46. Skips	The number of skips exceeds the programmed value.
47. Doubles	The number of doubles exceeds the programmed value
48. Start of output	Output has begun within the preset time limit. Time limit 10 seconds.
57. Error in radar signal	An abnormal change in radar speed has been detected. If the error repeats, check the cabling, connectors and connections Recalibrate the radar The sensor may be defective.
63. Faulty system pressure detector	Check that the measured power for the system pressure detector is in the range 4-20 mA. If not, the detector or the cable to the detector may be damaged. The relevant information can be found on the Information page of the WorkStation that the detector is installed on.
65. Enabled mandatory row units	
86. Irregular sowing	One or more motors have paused and then continued. The result is a gap in sowing, or gaps in the case of multi-row units. This error only occurs in connection with a seed motor.
87. Dusty sensor (seed dusty sensor)	
88. sensor supply voltage low (seed voltage low)	
113. Fertiliser level too low (TPL) If there is fertiliser in the hopper:	Check the fertiliser level in the hopper where the level sensors are placed. The sensitivity of the sensor has been incorrectly set.
116. Fan speed too high, fertiliser	The fan speed is higher than the set upper alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels.
117. Fan speed too low, fertiliser	The fan speed is lower than the set upper alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels.
118 Height report absent from ISOBUS.	Check the ISOBUS cable between the tractor and Gateway and, if possible, whether or not the tractor terminal has been configured to send the speed via the Isobus.
119. Speed report absent from ISOBUS.	Check the ISOBUS cable between the tractor and Gateway and, if possible, whether or not the tractor terminal has been configured to send the speed via the Isobus. Ascertain that Tempo supports reception of both “ground-based” and “wheel-based” speeds and ensure that the selected speed source is supported by the tractor terminal.
122. Pressure too high, Central Fill	The fan’s speed is higher than the set *upper* alarm level Check the alarm limit settings that are programmed in the menu for alarm levels.

123. Pressure too low, Central Fill	The fan's speed is lower than the set *lower* alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels. Check the rotation speed sensor cable, connectors and connections. Check the sensor's functionality by rotating the fan wheel manually and checking the diode on the sensor. The diode should light up when the pin on the fan shaft passes the sensor. The gap between the sensor and the pin should be between 1 and 2 mm. Adjust if necessary. An illuminated diode is no guarantee that the sensor is working properly. If the alarm appears only occasionally, this is probably because the sensor is either incorrectly adjusted or defective. Check that the PTO shaft is rotating (if PTO installed). Check the PTO system's flow valve setting (if PTO installed).
124. Fan speed too high, Central Fill	The fan speed is higher than the set upper alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels.
125. Fan speed too low, Central Fill	The fan speed is lower than the set upper alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels.
131. Old SW version in WS9	The Software version of the WS9 is too old for the required features on the machine. Let a service technician update the WS9.
200. Configuration fault	The configuration failed to upload.
207. Air pressure detector fault	Check the cable and the connector for the detector.
208. Air pressure detector fault for Central Fill	Check the cable and the connector for the detector.
210. Overcurrent for wheel locking valve	Check the cable and the connector for the valve.
211. Overcurrent for lift stop valve	Check the cable and the connector for the valve.
212. Overcurrent for lowering stop valve	Check the cable and the connector for the valve.
214. Short circuit for wheel locking valve	Check the cable and the connector for the valve.
215. Short circuit for lift stop valve	Check the cable and the connector for the valve.
216. Short circuit for lowering stop valve	Check the cable and the connector for the valve.
222. WSX software upgrade failed	Restart the system.
227. Singulator reached max	Calibrate the singulator.
238. Overcurrent wing folding valve	Check the cable and the connector for the valve.
241. Short circuit wing folding valve	Check the cable and the connector for the valve.
244. Detector fault for seed motor	Check the cable and the connector for the seed motor.

245. Detector fault for microgranulate motor	Check the cable and the connector for the microgranulate motor.
246. Detector fault for fertiliser motor	Check the cable and the connector for the fertiliser motor.
247. Low voltage for seed motor	Check the cable and the connector for the seed motor.
248. Low voltage for microgranulate motor	Check the cable and the connector for the microgranulate motor.
249. Low voltage for fertiliser motor	Check the cable and the connector for the fertiliser motor.
250. Short circuit for seed motor	Check the cable and the connector for the seed motor.
251. Short circuit for microgranulate motor	Check the cable and the connector for the microgranulate motor.
252. Short circuit for fertiliser motor	Check the cable and the connector for the fertiliser motor.
253. Overcurrent for seed motor	Check the cable and the connector for the seed motor.
254. Overcurrent for microgranulate moto	Check the cable and the connector for the microgranulate motor.
255. Overcurrent for fertiliser motor	Check the cable and the connector for the fertiliser motor.
259. High torque seed motor	Open the seed meter and check if the seed disc inside it is stuck.
260. High torque microgranulate motor	Check if the microgranulate distributor cylinder is stuck.
261. High torque fertiliser motor	Check if the microgranulate distributor cylinder is stuck.
265. Rotation fault seed motor	Open the seed meter and check if the seed disc inside it is stuck.
266. Rotation fault microgranulate motor:	Check if the microgranulate distributor cylinder is stuck.
267. Rotation fault fertiliser motor	Check if the fertiliser distributor cylinder is stuck.
268. Lost connection to WorkStation	Check the connector cable to WorkStation.
269. Lost connection to WorkStation row unit	Check the connector cable to the WS for the detected row.
270. Lost connection to WorkStation central	Check the connector cable to the central WS.
271. Lost connection to WorkStation fertiliser	Check the connector cable to the fertiliser WS
272. Connection with WorkStation re-established	Check power and CANBUS Cables to WS
273. Connection WorkStation row unit re-established	Check the power and CANBUS cables to the WS for the detected row.
274. Connection re-established with Work-Station central	Check the power and CANBUS cables to the WS for the detected row.
275. Connection re-established with Work-Station fertiliser	Check power and CANBUS cables to fertiliser WS
276. Missing WorkStation	Check cables to WS.
277. Missing WorkStation row unit	Check the cables to the WS for the detected row.
279. Missing WorkStation fertiliser	Check cables to fertiliser WS.

506. Singulator blocked	Open the seed meter and check if the singulator disc is blocked. Remove any seeds that are stuck.
510. Detector fault for row unit pressure	Check if the distributor cylinder for the row unit pressure is stuck
511. System pressure fault for row unit pressure	Check if the distributor cylinder for the row unit pressure is stuck.
513. Max motor speed for seed motor	The machine moves too fast for the seed motor to be able to handle the desired sown amount. Reduce the speed or change the number of holes for the seed disc in the seed meter.
514. Max motor speed for microgranulate motor:	The machine moves too fast for the micro-granulate motor to be able handle the desired sown amount. Reduce the speed or change the sown amount to improve distribution.
515. Max motor speed for fertiliser motor	The machine moves too fast for the fertiliser motor to be able to handle the desired seed amount. Reduce the speed or change the sown amount to improve distribution.
518. Overcurrent for singulator motor:	Check the cable and connector for the singulator motor.
524. Short circuit for singulator motor	Check the cable and connector for the singulator motor.
531. CAN warning	Faulty CAN communication. Check the CANBUS cable and connector between GW and WS.
532. Detector fault for machine height detector	Check the detector cable for machine height.
533. Detector fault for level sensor	On the information page for the WS that the detector is fitted to, check whether the detector value updates when you block the detector. The value should change between 0 and 1. If the value does not change, the detector or cable may be faulty. Check that the cable and connector are intact.
545. Overcurrent for agitator motor	Check the cable and connector for the agitator motor.
546. Short circuit for agitator motor	Check the cable and connector for the agitator motor.
550. Overcurrent in plus valve for row unit pressure	Check the cable and connector to the plus valve for the row unit pressure.
551. Overcurrent in minus valve for row unit pressure	Check the cable and connector to the minus valve for the row unit pressure.
552. Overcurrent in ON/OFF valve for row unit pressure	Check the cable and connector to the ON/OFF valve for the row unit pressure.
557. Detector fault for agitator motor	Check the cable and connector to the seal pressure valve.
565. Overcurrent for bout marker arms	Check the cable and connector to the bout marker arm valve.
567. Overcurrent for seal pressure	Check the cable and connector to the seal pressure valve.
568. Overcurrent for auger	Check the cable and connector to the auger valve.
569. Short circuit for bout marker arms	Check the cable and connector to the seal pressure valve

571. Short circuit for seal pressure	Check the cable and connector to the seal pressure valve.
572. Short circuit for auger	Check the cable and connector to the auger valve.
574. Wire fault: Internal fault for WS.	Try acknowledging the alarm. After this, the system will restart. If the fault persists, try disconnecting the power cable to the detected WS connector. Finally, contact support.
575 Overcurrent in locking valve 1 for row unit pressure	Check the cable and connector to locking valve 2 for row unit pressure.
576. Overcurrent in locking valve 2 for row unit pressure	Check the cable and connector to locking valve 2 for row unit pressure.
577. Communication disturbance	
580. Overcurrent for work ligh	Check the cable and connector to the work light. Check on the information page for the WS that the work light is fitted to whether the value changes between 0 and 1 when the light is turned on or off
581. Short circuit for work light	Check the cable and connector to the work light. Check on the information page for the WS that the work light is fitted to whether the value changes between 0 and 1 when the light is turned on or off.
583. Wire fault for central unit	Check the cable and connector to the work light. Check on the information page for the WS that the work light is fitted to whether the value changes between 0 and 1 when the light is turned on or off.
584. Wire fault for left fertiliser unit:	Try acknowledging the alarm. After this, the system will restart. If the fault persists, try disconnecting the power cable to the detected WS connector. Finally, contact support
585. Wire fault for right fertiliser unit:	Try acknowledging the alarm. After this, the system will restart. If the fault persists, try disconnecting the power cable to the detected WS connector. Finally, contact support.
586. Wire fault for row unit	Try acknowledging the alarm. After this, the system will restart. If the fault persists, try disconnecting the power cable to the detected WS connector. Finally, contact support.
591. Central seed tank empty	Check if the tank for Central Fill is empty. If not, there may be a fault in the detector, its cable, or the connector.
593. BioDrill tank empty	Check if the tank for Central Fill is empty. If not, there may be a fault in the detector, its cable, or the connector.
593. BioDrill tank empty	Check if the BioDrill tank is empty. If not, there may be a fault in the detector, its cable, or the connector.
697. Lost connection to PDB	Check the CANBUS cable from GW to PDB.
698. Connection for PDB re-established	Check the CANBUS cable from GW to PDB.
699. Missing power distributor box PDB	Check the CANBUS cable from GW to PDB.
700. Low voltage for PDB 12V battery	Check the cable between the tractor and PDB.
701. High voltage for PDB 12V battery	Check the cable between the tractor and PDB.

702. Low voltage for PDB 48V generator	Check the cable between the tractor and PDB.
703. High voltage for PDB 48V generator	Check the cable between the tractor and PDB.
704. Short circuit for PDB outlet 1	Check cable from PDB outlet 1.
705. Short circuit for PDB outlet 2	Check cable from PDB outlet 2.
706. Short circuit for PDB outlet 3:	Check cable from PDB outlet 3
707. Short circuit for PDB outlet 4	Check cable from PDB outlet 4.
708. Short circuit for PDB outlet 5	Check cable from PDB outlet 5.
709. Overcurrent for PDB outlet 1:	Check cable from PDB outlet 1.
710. Overcurrent for PDB outlet 2	Check cable from PDB outlet 2.
711. Overcurrent for PDB outlet 3	Check cable from PDB outlet 3
712. Overcurrent for PDB outlet 4	Check cable from PDB outlet 4.
713. Overcurrent for PDB outlet 5	Check cable from PDB outlet 5.
714. High Temperature for PDB outlet 1	Check cable from PDB outlet 1.
715. High temperature for PDB outlet 2:	Check cable from PDB outlet 2.
716. High temperature for PDB outlet 3	Check cable from PDB outlet 3
717. High temperature for PDB outlet 4	Check cable from PDB outlet 4
718. High temperature for PDB outlet 5	Check cable from PDB outlet 5.
719. Low battery voltage for PDB	Check that the generator is running. The fan must be on for the generator to be able to generate power.
720. Discharged battery for PDB	Check that the generator is running. The fan must be on for the generator to be able to generate power.
751. Surplus of WorkStations	Check that all WS are correctly mapped to a row unit under “Unit” and that they have the correct status under “Row unit”.
758. Overcurrent for WideLining	Check the cable and connector for WideLining.
759. Short circuit for WideLining	Check the cable and connector for WideLining.
769. Overcurrent in On/Off valve for wing pressure	Check the cable and connector to the On/Off valve for wing pressure
770. Short circuit in On/Off valve for wing pressure	Check the cable and connector to the On/Off valve for wing pressure.
771. Overcurrent in proportional valve for wing pressure	Check the cable and connector to the proportional valve for wing pressure.
772. Short circuit in proportional valve for wing pressure	Check the cable and connector to the proportional valve for wing pressure

775. Detector fault for singulator motor	Check the cable and connector for the singulator motor.
776. Curve compensation fault	The actual curve compensation speed differs from the expected speed for one or more units. Try acknowledging the alarm and see if the alarm persists after restarting. If it does, turn off curve compensation and contact customer service.
777. Deviating row unit pressure	Go to the information page under row unit pressure and check that the pressure does not deviate too much for any row. If it does, troubleshoot the line with the deviating pressure.
782. Task controller insufficient booms	More booms for section control is used then what the task controller supports. Go to task control settings and update the number of booms used for section control.
783. Task controller insufficient sections	More sections for section control is used then what the task controller supports. Go to task control settings and update the number of sections used for section control.
784. Task controller insufficient control channels	More control channels for variable rate is used then what the task controller supports. Go to task control settings and update the number of control channels used for variable rate.
785. Seed hopper empty	
786. Seed bin level too low	
797. Detector fault in load cell for row unit pressure	Check the cable and connector to the load cell detector.
798. Sensor fault for Seed bin level	
799. Low voltage for system pressure detector	Check the cable and connector for the system pressure sensor.
800. Overcurrent for system pressure sensor	Check the cable and connector for the system pressure sensor.
801. Short circuit for system pressure sensor	Check the cable and connector for the system pressure sensor
810. Machine height missing for coulter force controlled	If possible, check the lift control page that the height will update when changing the machine height. Check cable and connector for the height sensor.
811. System pressure missing for coulter force controlled	Check cable and connector for system pressure for coulter force.
812. Fan speed missing for coulter force control	Check cable and connector for seed fan.
813. Ground speed missing for meter control	Check that correct speed source is selected for the machine. Check cable for speed source.
814. Ground speed missing for precision meter controlled	Check that correct speed source is selected for the machine. Check cable for speed source.
815. Machine height missing for wing force	Check that correct height source is selected for the machine. Check cable and connector for the height sensor.

818. Ground speed missing for wideLining	Check that correct speed source is selected for the machine. Check cable for speed source.
819. Isobus stop button pressed	
820. Overcurrent for wing pressure	Check cable and connector to the wing pressure valve.
821. Short circuit for wing pressure	Check cable and connector to the wing pressure valve.
822. Pressure too high for wing pressure	
823. Pressure too low for wing pressure	
824. Lost connection to front hopper WS	Check the power and CANBUS cables to the front hopper WS.
825. Missing front hopper WS	Check the cable and connector to the front hopper WS.
826. Regained connection to front hopper WS	Check the power and CANBUS cables for the front hopper WS.
841. Task controller tramline guidance reference line changed	
842 Task controller tramline swath width overlap detected	
999. Unknown alarm	Contact customer service.

18.1 Alarm List FrontHopper

70. Fan speed too high	The fan's speed is higher than the set *upper* alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels.
71. Fan speed too low	The fan's speed is lower than the set *lower* alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels. Check the rotation speed sensor cable, connectors and connections. Check the sensor's functionality by rotating the fan wheel manually and checking the diode on the sensor. The diode should light up when the pin on the fan shaft passes the sensor. The gap between the sensor and the pin should be between 1 and 2 mm. Adjust if necessary. An illuminated diode is no guarantee that the sensor is working properly. If the alarm appears only occasionally, this is probably because the sensor is either incorrectly adjusted or defective.
72. Rotation sensor: fertiliser	
If the feed rollers are not moving	The dispensing cylinder is stuck. Check the power supply to the metering unit. Check the motor and the cabling to it.
If the alarm appears despite rotation of the output rollers	Check the cabling, contacts and connections. The sensor is not emitting a signal.
73. fertiliser level sensor	Check the fertiliser level in the fertiliser hopper.
If there is fertiliser in the hopper	Check that the sensor is not dirty or damp. Wipe the sensor clean with a cloth Check the cables, contacts and connection The sensor may be defective. The sensitivity of the sensor has been incorrectly set.
74. Level sensor (FrontHopper)	
Level sensor error	Check the sensor's cable, contacts and connections. Check that the sensor is not dirty or damp. Wipe the sensor clean with a dry cloth The sensor may be defective.
75. Supply voltage for FrontHopper is too low	Check that the connectors and supply cables from the tractor to FrontHopper are correctly connected. Check the tractor's charging voltage.
76. Supply voltage for FrontHopper motor is too low	Check that the connectors and supply cables from the tractor to FrontHopper are correctly connected. Check the tractor's charging voltage.

77. FrontHopper fault, motor 1	Check if there is fertiliser residue/buildup under or in the motor housing. Clean and run with a higher fan speed. Check the gear setting and cabling Check the power supply to the output unit. Check the cabling, connectors and connections.
78. Temperature is too high (FrontHopper)	The machine will not start or stops because the system has been overloaded. Check and clean the metering unit if it has stopped. Wait until the machine has cooled down. Upper limit 80°C.
79. Temperature is too low (FrontHopper)	The machine will not start because the temperature has dropped below the permissible limit (-5°C) for an appropriate output working temperature.
80. CAN timeout for GW to FrontHopper	The time limit for CAN communication between Gateway and FrontHopper has expired. Check that the motor outputs on FrontHopper are configured. Check the cabling between Gateway and FrontHopper. Check the ground cables in the entire installation.
81. CAN timeout for FrontHopper to GW	The time limit for CAN communication between Gateway and FrontHopper has expired. Check that the motor outputs on FrontHopper are configured. Check the cabling between Gateway and FrontHopper. Check the ground cables in the entire installation.
82. Maximum speed	
The motor is running at full speed but the application rate has not been achieved	Check that the application rate is not set to a value that is too high The system is not capable of delivering the desired application rate if the application rate is set too high
83. FrontHopper fault, motor 2	Check the gear setting and cabling Check the power supply to the metering unit Check the cabling, connectors and connections.
84 Error in WS6 software version for FrontHopper	Incorrect WS6 software version Contact service personnel for a WS6 software update.

18.2 Alarm Work Station (WS6)

When an alert that affects Work Station (WS6) happens, the alarm is shown as a high-intensity LED which flashes x times, then waits 4 seconds before recommencing the sequence. Should several alerts occur simultaneously, only the alert with the highest priority is displayed. x = 1 has the highest priority

No. blinks	Error
1	Low logic supply voltage
2	Low power supply voltage
3	Faulty motor power (Polyswitch)
4	Overload protection tripped (software controlled)
5	Thermal MOSFET protection tripped
6	Card temperature too high
7	Card temperature too low
8	CAN communication fault

18.3 Alarm list BioDrill

136. BioDrill fan speed too high	The fan's speed is higher than the set *upper* alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels
137. BioDrill fan speed too low	The fan's rotation rate is lower than the programmed *lower* alarm level. Check the alarm limit settings that are programmed in the menu for alarm levels.
138. BioDrill level senso	Check the BioDrill seed hopper level.
139. BioDrill level sensor error	Check the sensor's cable, contacts and connections. Check that the sensor is not dirty or damp. Wipe the sensor clean with a dry cloth. The sensor may be defective.
141. Supply voltage for BioDrill is too low	Check that the connectors and supply cables to the BioDrill are correctly connected. Check the tractor's charging voltage.
142. CAN Timeout for BioDrill	The time limit for CAN communication between Gateway and BioDrill has expired. Check that the motor outputs on BioDrill are configured. Check the wiring between Gateway and BioDrill. Check the ground cables in the entire installation.
143. Motor voltage BioDrill	Check that the connectors and supply cables to the BioDrill are correctly connected. Check the tractor's charging voltage.
144. Current too high for MOSFET BioDrill	There is a thermal overload of the BioDrill motor. Check and clean the output unit if it has stopped
145. Programmable over-current: BioDrill	There is an overload of the BioDrill motor. The motor trips when the power supply exceeds 5 A.
146. BioDrill temperature sensor fault	The temperature in the sensor is too high. Switch off and wait until the sensor has cooled.
147. BioDrill temperature is too high	The machine will not start or stops because the system has been overloaded. Check and clean the output unit if it has stopped. Wait until the machine has cooled.
148. BioDrill temperature is too low	The machine will not start because the temperature is below the lower limit for working temperature for seed feeding.
149. Rotation guard, BioDrill	Check the power supply to the output unit. Check the motor and the cabling to it.

150. BioDrill rotation guard motor error	Check whether there are product residues in or under the motor housing. Clean and run the motor at a higher speed by increasing the fan's rpm. Check the gear setting. Check the power supply to the output unit. Check the cabling, connectors and connections.
151. BioDrill rotation guard	Check the power supply to the output unit. Check the motor and the cabling to it.
755. Lost connection to WorkStation for BioDrill	Check the power and CANBUS cables to WS for BioDrill.
756. Connection re-established to WorkStation for BioDrill	Check the power and CANBUS cables to WS for BioDrill.
757.Missing WorkStation for BioDrill	Check the cables to the WS for BioDrill.
802. Detector fault for BioDrill motor	Check the cable and connector for the BioDrill motor.
803. Low voltage for BioDrill motor:	Check the cable and connector for the BioDrill motor.
804. Short circuit for BioDrill motor	Check the cable and connector for the BioDrill motor.
805. Overcurrent for BioDrill motor	Check the cable and connector for the BioDrill motor.
806. High torque for BioDrill motor	Check if anything is stuck in the BioDrill distributor.
807. Rotation fault for BioDrill motor	Check if anything is stuck in the BioDrill distributor.
808. Max motor speed for BioDrill motor	The machine moves too fast for the BioDrill motor to be able to handle the desired seed amount. Reduce the speed or change the sown amount to improve distribution
999. Unknown alarm	Contact customer service. Try acknowledging the alarm and see if the alarm disappears.

18.4 Alarm list for liquid fertiliser

723. Liquid fertiliser system pressure too low	Check that there is no air in the system. If so, run fill program. Systemtrycksgivaren kan ge felaktig signal.
724. Liquid fertiliser system pressure too high	The system pressure sensor may give an incorrect signal.
729.Liquid fertiliser fill valve undercurrent	The fill valve is drawing too low a current. Check the valve, cables, connectors and connections
730. Liquid fertiliser pump control valve undercurrent	The fill valve is drawing too low a current.. Check the valve, cables, connectors and connections
731. Liquid fertiliser circulation valve undercurrent	The circulation valve is drawing too low a current Check the valve, cables, connectors and connections.
732. Liquid fertiliser dosing valve A undercurrent	Dosing valve A is drawing too low a current. Check the valve, cables, connectors and connections.
733. Liquid fertiliser tank level detector fault	Check the sensor’s cable, contacts and connections.. The sensor may be defective.
735. Liquid fertiliser system pressure detector fault	Check the sensor’s cable, contacts and connections. The sensor may be defective.
738. Liquid fertiliser low pump speed	The pump is not reaching the target speed. Check that there is hydraulic flow in the pump
739. Liquid fertiliser no pump flow	Check that there is no obstruction in the flow system.. Check that the pressure valve is not closed. If it is closed, run the pressure valve reset program.
741. Liquid fertiliser low feed rate	The machine is unable to achieve the set feed rate. Check that the correct dosing nozzle sizes are set and installed.. Reduce the speed and drive more slowly. Switch to larger dosing nozzles.
742. Liquid fertiliser tank level too low	The tank level is below the set minimum alarm level. Fill the tank or lower the alarm level.
743. Liquid fertiliser dosing valve B undercurrent	Dosing valve B is drawing too low a current. Check the valve, cables, connectors and connections.
744. Connection to WorkStation liquid fertiliser dosing has been lost	Check the connector cable to liquid fertiliser dosing WS.

745. Connection to WorkStation liquid fertiliser dosing has been restored	Check the power and CANBUS cables to liquid fertiliser dosing WS.
746. WorkStation liquid fertiliser dosing is missing	Check cables to liquid fertiliser dosing WS.
747. Liquid fertiliser high feed rate	The machine cannot reach a low enough feed rate. Check that the correct dosing nozzle sizes are set and installed.. Increase your speed and drive faster. Switch to smaller dosing nozzles.
748. Liquid fertiliser pressure detector suction filter fault	Check the sensor’s cable, contacts and connections. The sensor may be defective.
749.Liquid fertiliser no flow suction filter	Check that the suction filter is not clogged
752. Connection to WorkStation liquid fertiliser has been lost	Check the connector cable to liquid fertiliser WS.
753. Connection to WorkStation liquid fertiliser has been restored	Check the power and CANBUS cables to liquid fertiliser WS.
754. WorkStation liquid fertiliser is missing	Check cables to liquid fertiliser WS..
833. Ground speed missing for liquid fertiliser	Check that correct speed source is selected for the machine. Check cable for speed source.
834.System pressure missing for liquid fertiliser	Check cable and connector for system pressure for liquid fertilizer.
835. Bin level missing for liquid fertiliser	Check cable and connector for bin level sensor for liquid fertilizer.
836. System pressure missing for liquid fertiliser	Check cable and connector for system pressure for the liquid fertilizer suction filter.
837. Short circuit in circulation valve for liquid fertiliser	Check cable and connector to the circulation valve for liquid fertilizer.
838. Overcurrent in circulation valve for liquid fertiliser	Check cable and connector to the circulation valve for liquid fertilizer.
839. Short circuit in filling valve for liquid fertiliser	Check cable and connector to the filling valve for liquid fertilizer.
840. Overcurrent in filling valve for liquid fertiliser	Check cable and connector to the filling valve for liquid fertilizer.

19 Download instructions and video

To download instructions and videos to your iPad, it must be connected to the Internet.

The machine's software is updated continuously and to ensure that you have access to the latest version of the instructions, it is also possible to download both the instructions and Quick start videos directly to your iPad.

The instructions and videos are stored locally on your iPad

To download to your iPad, do the following:

1. Connect to the Internet.
2. Start the app.

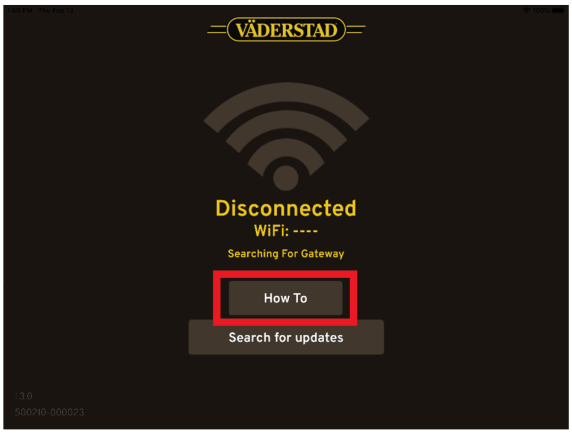

Figure 19.1

3. Go to the ‘How to’ page.

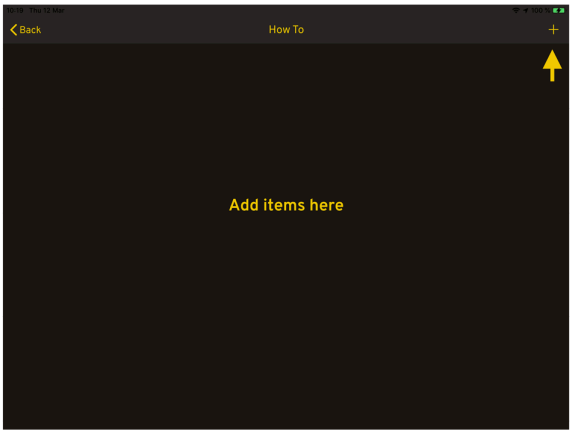

Figure 19.2

4. To download documents. Press + the character in the top right corner.

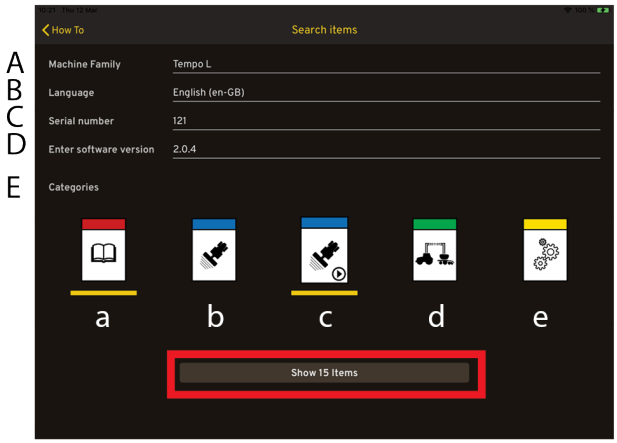

Figure 19.3

On the Search page, you can filter on:

A. Machine family
B. Language
C. Serial number
D. Software version
E. Category
   a. Instruction manual
   b. Quick Start
   c. Quick Start video
   d. Quick Start Isobus
   e. Spare parts book

5. Machine family and language are mandatory fields. Press the Show button.

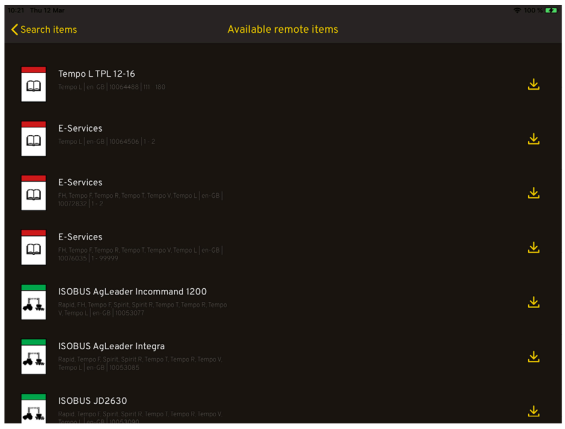

Figure 19.4

6. The search results page appears.

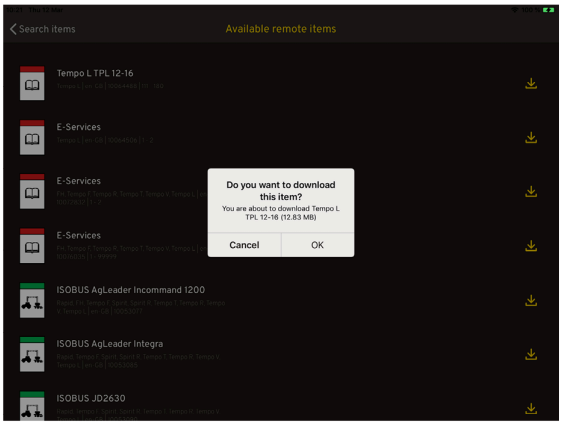

Figure 19.5

7. To download the document, click on the  icon on the right-hand end of each row.
8. Then press OK.

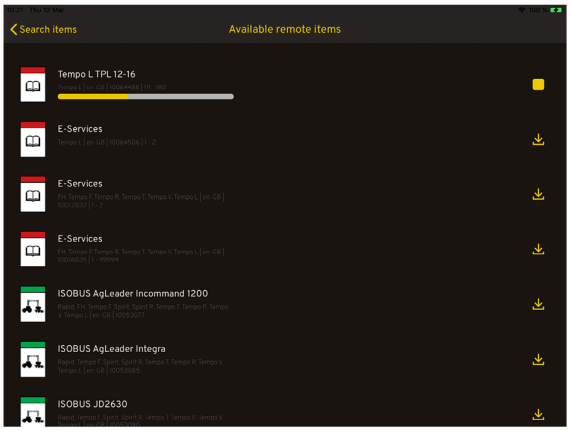

Figure 19.6

9. Download started. Stop downloading by clicking on the stop icon  on the right.

19.1 Viewing on iPad

When the download has finished, return to the ‘How to’ home page to open the saved document.

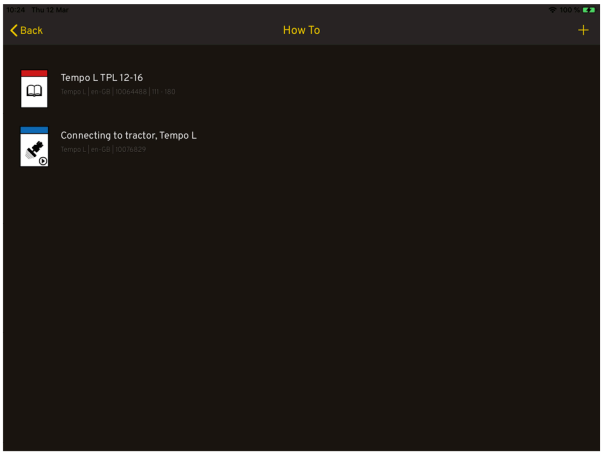

Figure 19.7

Click on the line to open the document or video

When a document is open (not video), you can use three different help functions to find your way in the document easier.

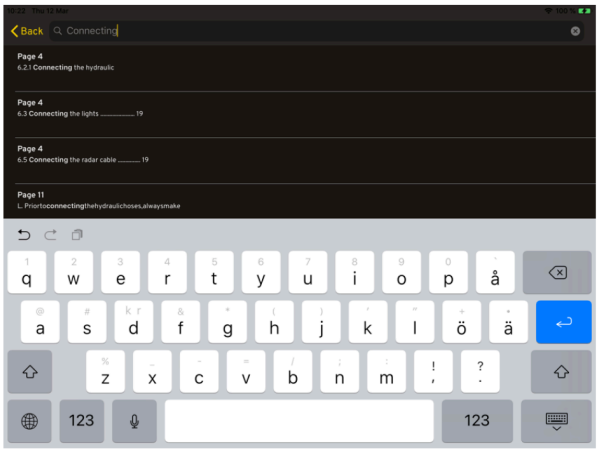

Figure 19.8

Search, enter any word in the search field. See *“Figure 19.8 “*.

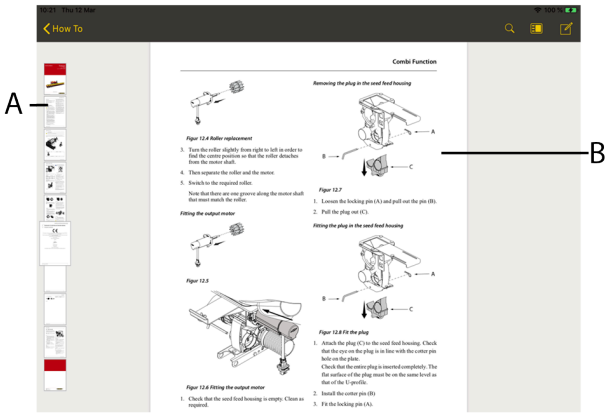

Figure 19.9

Or with thumbnails  and obtain view (A) or browse/ scroll in the document (B).

19.2 Updating previously downloaded files

The symbol is only visible when you are connected to the Internet..

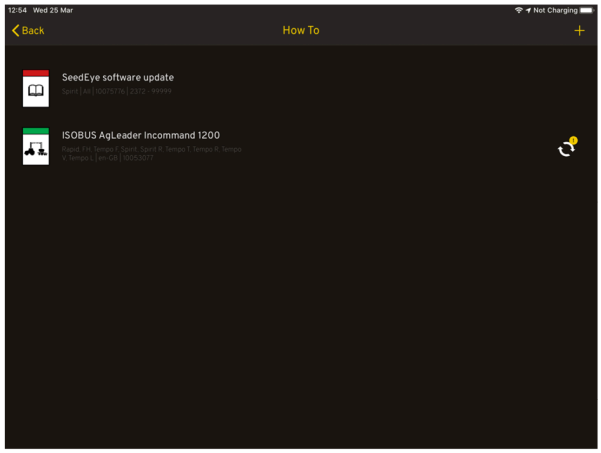

Figure 19.10

If there is a new version of previously downloaded instructions or video, the icon will be lit next to the instructions or video that can be replaced.

19.3 Delete instructions or video

If the memory is full, an error message appears on screen when you try to download.

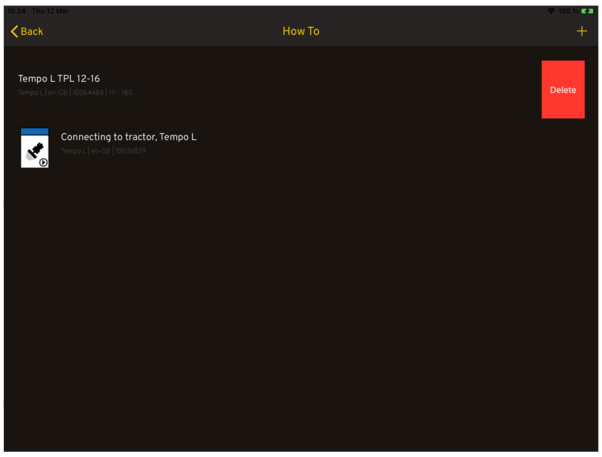

Figure 19.11

To delete instructions or a video. Swipe to the left of the instruction or video you want to delete and press Delete.

20 Release notes

Version	Information
5.0.2	• Support WSX HW Gen2 (FCC approved). • The PDB now disconnects the battery when the generator stops, to avoid discharging the battery.
5.0.1	Initial release

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Where farming starts