

User Manual

Machine Control Solution



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1. Introduction

This manual contains important information on how to install, configure, and use the display. To access the complete manual with all other display features and products, download the document version available from the Hexagon Agriculture website support (<https://hexagonagriculture.com/support/manuals>).

Initials informations:

- Carefully read this user manual before turning the display on;
- To ensure your safety, observe the instructions contained in the **User Manual** and the **Safety Manual** issued by the manufacturer of the farming machinery;
- The images in this manual are purely illustrative. Screens and visual elements may differ from the actual items.

The symbols used in this manual have the following meanings:

 Warning	Indicates a potentially hazardous situation or misuse which, if unavoided, may result in minor to moderate injury, material loss, financial loss and/or environmental loss.
 Danger	Indicates an imminently hazardous situation which, if unavoided, may result in serious injury or death.
 Important	Important information that must be observed so that display is used in a technically correct and efficient manner.

2. Safety instructions

- [Allowed usage](#)
- [Use risks](#)
- [Electromagnetic compatibility](#)

2.1 Allowed usage

The following instructions aim to inform users about the inherent risks to display operation as well as how to avoid them.



Warning

Only use the display computer on vehicles with farming purposes such as tractors, sprayers, planters, fertilizer applicators, subsoilers, trucks, among others.

It is not allowed:

- Using outside the restrictions imposed in this manual;
- Opening the device with tools, except with technical support's written permission;
- Modifying or altering the product;
- Using the display with obvious damage or defects;
- Using the display with accessories from other manufacturers without approval.



Warning

The display must not be used without the user being aware of the correct product usage. Its incorrect usage may result in personal injury, breakdown, and damage.



Danger

Unauthorized modification of the vehicle for mounting or installing the display may alter the operation and safety of the agriculture machinery.



Warning

Verify the integrity of the results of the display's measurements after a fall or misuse, transport, modification, or when stored for long periods of time.

2.2 Use risks

- Use of the display is not recommended during thunderstorms due to the risk of being struck by lightning;
- Keep a safe distance from electrical installations and components;
- In case the product will not be used for a long time, it is recommended to disconnect all components and cables;
- To clean the display's monitor, use a soft cloth moistened with 50% isopropyl alcohol.

Incorrect disposal of the display may cause the following problems:

- Release of poisonous gases in case of polymer burning;
- Improper product use, resulting in serious physical harm;
- Contamination of the environment.



Warning

The display must not be mixed with household waste. It must be disposed of in accordance with regulations in force in the country of use.

2.3 Electromagnetic compatibility

Electromagnetic compatibility refers to the product's ability to function properly in an environment with electromagnetic radiation and electrostatic discharge, without causing electromagnetic disturbances to other devices.



Warning

Electromagnetic radiation may cause disturbances in other devices. Although this product fully meets the strictest regulations and standards in force, Hexagon Agriculture cannot completely exclude the possibility of interference with other devices.

There is a risk that interference may occur in other devices if the instrument is used with accessories from other manufacturers such as computers, laptops, radios, non-standard cables, external batteries, etc.

Recommendations:

- **Only use devices and accessories recommended by Hexagon Agriculture.** When used with this instrument, such accessories meet the strictest requirements of the regulations and standards in force;
- **Consider the information on electromagnetic compatibility provided by computer and transceiver radios during their use;**
- Monitor measurement results when operating in areas with disturbances caused by electromagnetic radiation, as these may lead to incorrect results. **Although this product fully meets the strictest regulations and standards in force, Hexagon Agriculture cannot completely exclude the possibility of interference in the instrument caused by intense electromagnetic radiation emitted, for example, by radio transmitters, generators, electric cables, etc.**
- **Always connect both ends of the cables during use.** If the instrument is used with cables connected only to one end, the permissible level of electromagnetic radiation may be exceeded and the correct operation of the instrument may be affected;
- **Do not operate the product with radio devices or mobile phones near fuel stations, chemical facilities, areas with explosion hazards, medical devices, or aircraft.** The electromagnetic fields caused by using the product with radio devices or mobile phone may cause interference in other devices, facilities, aircraft, and medical instruments such as heart rate regulators or hearing aids. Electromagnetic radiation might even affect humans and animals. Although the product meets the regulations and standards in force, Hexagon Agriculture cannot completely exclude the possibility of other devices being disturbed or people and animals being affected.

3. Displays overview

- [Overview display Ti10](#)

3.1 Overview of the HxGN AgrOn Ti10

The HxGN AgrOn Ti10 is a complete precision farming guidance system with the following functions:

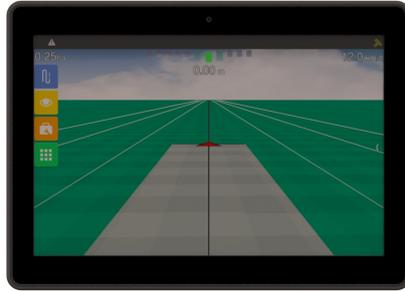


Figure - General application

3.1.1 System components

1. Display's monitor
2. GNSS antenna
3. Antenna suport
4. Antenna cable
5. Power cable
6. Arm - mounting bracket
7. Clamp - mounting bracket
8. Flashdrive
9. Documentation

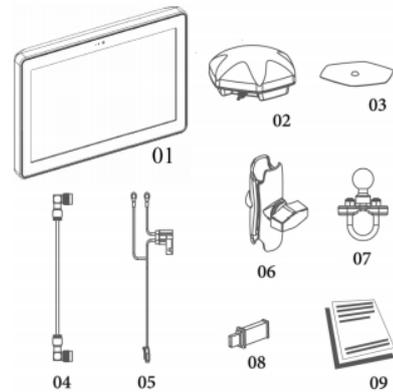


Figure - System components

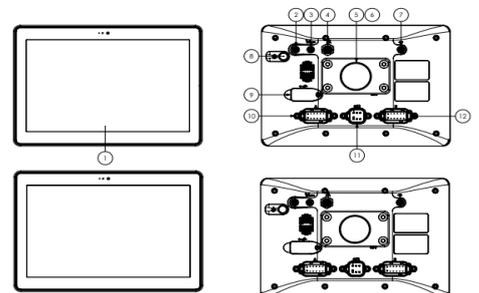
3.1.2 Views



Warning

The display was designed to be used with the touch of your fingers on the screen. Do not operate with sharp objects such as pens or screwdrivers as this may damage and affect the warranty of your product.

1. 10,1-inch color touchscreen
2. Secondary mobile data connection
3. Connection for mobile data
4. Connecting the GNSS antenna
5. Mounting bracket
6. SIM card slot
7. Wi-Fi antenna connection
8. Power button



- 9. USB interface
- 10. Connector A
- 11. Connector C
- 12. Connector B

Figure - Connector identification

See page 12 for more information on the connectors.

3.1.3 Product identification

The product type (model) and serial number are indicated on a label on the back of the display. Record the type and serial number in your manual and inform them when contacting technical support.



Figure - Product identification



Important

You can also check your device s serial number accessing the **Configuration menu – System settings – About.**

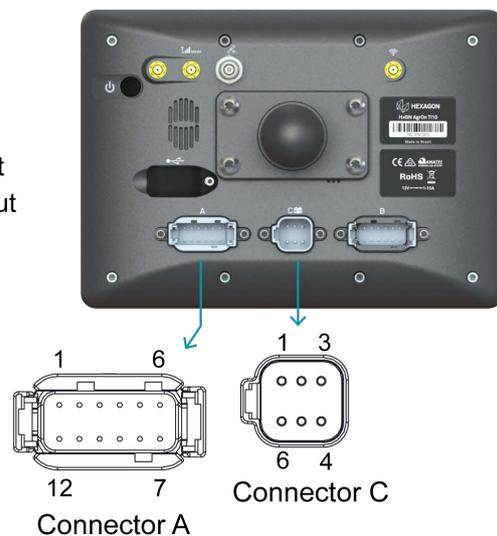
3.1.4 CAN connector pinout

Connector A

- 01 - Power Output
- 02 - CAN 1 High
- 03 - Radar Output
- 04 - CAN 2 High
- 05 - Power Output
- 06 - Serial 1 RS232 TX
- 07 - GND
- 08 - Serial 1 RS232 RD
- 09 - GND
- 10 - CAN 2 Low
- 11 - GND
- 12 - CAN 1 Low

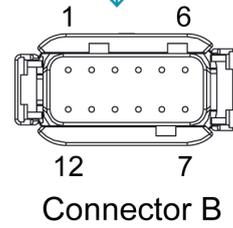
Connector C

- 01 - Battery -
- 02 - Battery +
- 03 - Power Output
- 04 - Sensor B input
- 05 - CAN 3 Low
- 06 - CAN 3 High



Connector B

- 01 - Power Output
- 02 - Sensor M input
- 03 - Buzzer Output
- 04 - Disabled
- 05 - Power Output
- 06 - Serial 2 RS232 TX
- 07 - GND
- 08 - Serial 2 RS232 RD
- 09 - Analog Output 1
- 10 - Analog Output 2
- 11 - GND
- 12 - Sensor P input



Connector B

4. Equipment's installation

- [Display's fixation](#)
- [SIM Card installation](#)
- [Antenna installation](#)

4.1 Displays's fixation



Warning

The display installation must be performed by a qualified technician. Read the safety instructions before performing the installation steps.



Warning

Do not mount the display where it can be struck by an airbag.

Ti10 display fixation

Choose an appropriate location for securing the display monitor within reach of the operator while seated in a normal operating position and in front of the operator's field of vision.

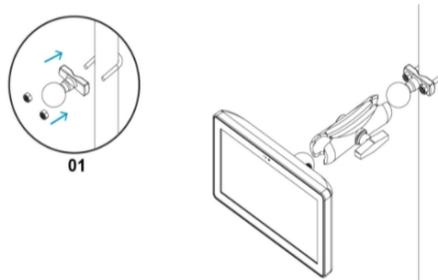


Figure - Display installation



Warning

Do not mount the display where it can be struck by an airbag.

To perform the installation, proceed as follows:

1. Mount the clamp to the desired location in the vehicle. To mount the clamp, wrap the bow around the tube, insert the base, and fasten with hex nuts. Use a socket wrench for better tightening;
2. Connect the clamp ball and the monitor to the mounting arm, firmly securing using the handle;
3. Position the assembly in a location visible to the operator and check if it is firm and secure;
4. Connect the power cable to a battery or to a location indicated by the vehicle manufacturer and connect the other end to the back of the display;
5. Connect the horn cable to the input/output connector.

4.2 SIM card installation



Warning

The viability of installing the SIM card should be checked by a qualified technician for the Ti10 display.

To enable remote communication on systems equipped with an internal modem, a SIM card is required.



Important

Only required in Wi-Fi + Mobile network version.

To install the SIM card, proceed as follows:

1. On the back of the display, remove the four screws as shown in the figure. Use the lowered space to make it easier to open the lid;



Figure - Opening the lid

2. Pull the insert down and open to a 90-degree angle;



Figure - SIM card housing step 1

3. Insert the SIM card into the slot, ensuring its proper positioning;
4. Close the opening and push up until you hear the locking sound;

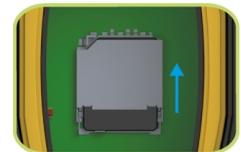


Figure - SIM card housing step 2

5. Put the back lid on and screw the removed screws.

4.3 Antenna installation



Warning

- The display antenna must be mounted on the roof of the vehicle, preferably front and center on the flat part of the roof;
- The antenna must be mounted horizontally and must not be tilted in order to ensure the best GNSS signal reception;
- It is necessary to keep the antenna as far away as possible from obstacles in order to ensure that the signal is received in all directions;
- A clear view of the sky to the horizon in all directions is recommended for the ideal reception of satellites, as obstacles close to the antenna prevent the reception of signals;
- Keep the GNSS antenna as far away from the radio antennas as possible;
- If the antennas are installed too close to each other there may be interaction between the antennas and a consequent loss of sensitivity.

To install the antenna, proceed as follows:

1. Clean and dry the roof of the vehicle to prepare the installation. We recommend isopropyl alcohol;
2. Check if the installation area on the roof is clean and dry;
3. Attach the GNSS antenna. It has magnets that attach to the vehicle's metallic roof. In case it is not metallic, use a metal bracket for fastening, using double-sided tapes on the back of the holder. Remove the tape's plastic protection and make it adhere to the roof of the vehicle;
4. Connect the antenna cable to the back of the display. The cable cannot be cut, twisted, or excessively bent, as its performance may be degraded causing the system to fail.

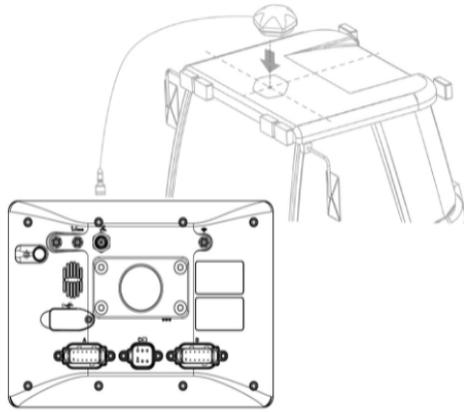


Figure - Ti10 monitor display antenna installation

5. Running display for the first time



Warning

We recommend starting the vehicle before turning the display on.

5.1 Starting the device

To turn the monitor on, proceed as follows:

1. Press the **On** Button on the front panel of the display for one second;
2. The display will show the screen for selecting **Language**, **Time Zone**, and **Theme**;
3. Enter the desired settings and confirm;
4. If operating in the quick launch mode, when starting your display for the first time, the new work session setup wizard will show. Go to topic [New job section on fast start mode](#);
5. If operating in the conventional launch mode, go to next topic [Job section](#).



Important

The fast start mode is only available for the display with solely and exclusively the **Guidance** activated. To enable or disable this function, select the **Fast mode ON/OFF** option located on the right side of the work session list. The display will always start in the same startup mode it was operating in when it was turned off (quick launch mode or conventional launch mode).

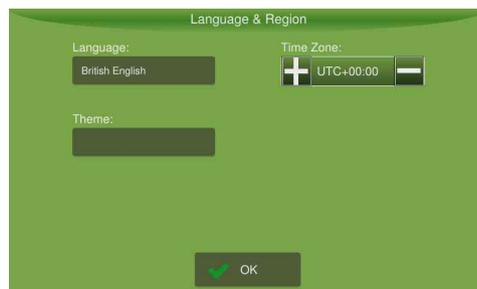


Figure - Language and time zone selection

5.2 Shutting down the monitor

To shutdown the monitor of your display, proceed as follows:

1. Press the **Off** button on the front of the module;
2. A confirmation message will be displayed;
3. Confirm the operation by selecting **Yes**;
4. Wait for the screen to turn off.



Warning

Do not remove the power source without the screen turning off completely.

6. Job section

A **job section** consists of the combination of various information that characterize a performed job, such as the performed activity, in which farm, in which field, etc.

In order to operate the display, there must always be a running work session, which may have been previously created or completely new. For this reason, when the device is turned on, the system directs the user to the **Job section** management screen.



Important

The **Job section** management may also be accessed at any time by the used through the **Configuration menu**.

Job section in conventional mode

From this screen one may **select, delete, or create a new** job section.

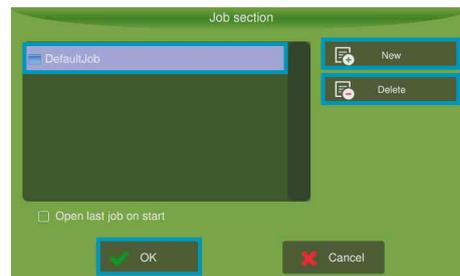


Figure - Conventional job section

Job section on fast start mode

The job section on fast start mode is only available for the displays with solely and exclusively the **Guidance** activated. To enable or disable this function, select the **Fast mode ON/OFF** option located on the right side of the job section list. The display will always start in the same startup mode it was operating in when it was turned off (fast start mode or conventional mode).

From this screen one may select, delete, or create a new job section, enable or disable the fast start mode, or view the settings of the last implement used.

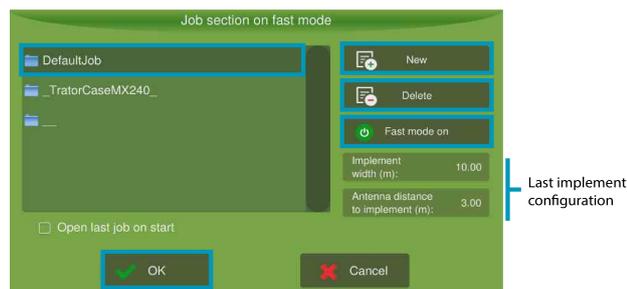


Figure - Job section on fast start mode

6.1 Selecting a job section

Job section selection is the same for both launch modes. See topic [Job section](#).

To select a job section, proceed as follows:

1. Select a **Job section** among those presented on the screen;
2. Press **OK** to start the operation.



Important

Regardless of the **Job section** selected from the list, display will always use the settings for the last implement used. To check the current values, on fast start mode they are displayed in the indicator boxes on the right side of the screen.

6.2 Inserting a job section

The way to create a new job section will depend on the type of startup:

- If operating in conventional mode, go to next topic [New job section in conventional mode](#),
- If operating in fast mode, go to topic [New section on fast start mode](#).

6.2.1 New job section in conventional mode

To create a new job section in conventional mode, proceed as follows:

1. On the **Job section** screen, select option **New**;
2. A message will be displayed informing the necessary input fields for creating a new job section;
3. Click **OK** to confirm reading the message;
4. The list of farms is presented;
5. Select a farm from the list or select **New** to insert a new farm;
6. Enter the farm name and select **OK** to confirm;
7. Confirm the name presented on the list and click **OK** to select;
8. The list of fields is presented;
9. Select a field from the list or select **New** to insert a new field;
10. Enter the field name and select **OK** to confirm;
11. Confirm the name presented on the list and click **OK** to select;
12. The list of activities is presented;
13. Select an activity from the list or select **New** to insert a new activity;
14. Enter the activity name and select **OK** to confirm;
15. Confirm the name presented on the list and click **OK** to select;
16. The new job section is created.



Important

The **Farm**, **Field**, and **Activity** fields only allow names with at most twelve characters. There cannot be work sessions with the same name (Farm, Field, and Activity).



Warning

When the **Open last session when starting** box is activated, the work session screen will no longer be displayed when the device is started. Instead, it will start directly at the operation window for the last used work session.

6.2.2 New job section on fast start mode

To create a new job section on fast start mode, proceed as follows:

1. Click on **New**;
2. On the **Implement and Vehicle** screen, insert the implement s width and the distance from the vehicle s antenna to the implement;
3. Confirm the operation selecting the **Save** option;
4. A message informing that the new job section has been created will be displayed;
5. Confirm you have read the message by selecting **OK**;
6. The operation screen will be displayed.

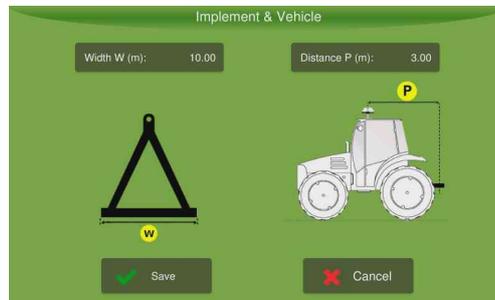


Figure - Implement and vehicle

6.3 Removing a job section

To remove a job section on fast start mode, proceed as follows:

1. Select a **Job section** among those presented on the screen;
2. Select option **Delete**;
3. A confirmation message will be displayed;
4. Confirm the operation by selecting **Yes**;
5. The **Job section** is deleted.



Important

The system will not allow deleting the **Job section** currently in use.

7. Operation screen

The operation consists of the main screen where the activities are in fact executed according to all the configured parameters and activations.

The display operation screen changes to suit the context of use that depends on the vehicle and related activity. For example, truck-type vehicles performing trips use the **Mode of operation with routes**, while tractors in the field use the **Mode of operation with lightbar**.



Warning

In case alerts exist, they will be displayed above the operation screen before execution begins.

Operation screen with lightbar

During operation, in order to provide a broader view of the field, only the following information and features will be visible:

1. Alerts
2. Notifications bar
3. Connectivity information
4. Operation bar
5. Lightbar
6. Suspended operation
7. Operation information

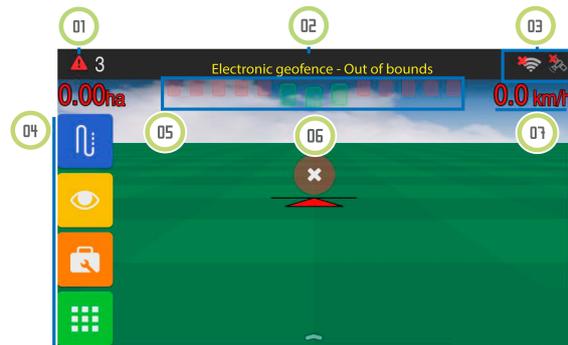


Figure - Operation screen with lightbar

7.1 Upper bar

7.1.1 Alerts



Important

Before starting any operation, make sure that there are no active alerts.

Alerts are displayed automatically on the screen during the operation. The operator may close them, but if the condition which triggered the alert continues to occur, the alert will be displayed on the top of the screen.

Slide the notification bar downwards to visualize the list of notifications and to preview the messages. Slide the bar upwards to close it again.



Figure - Alert notification



Important

When a notification message is clicked on, it is removed from the notification list but is still accessible through the alert icon on the upper left corner.

Click on the alert icon to access all active alarms and to obtain more detailed information on how to troubleshoot the problem.

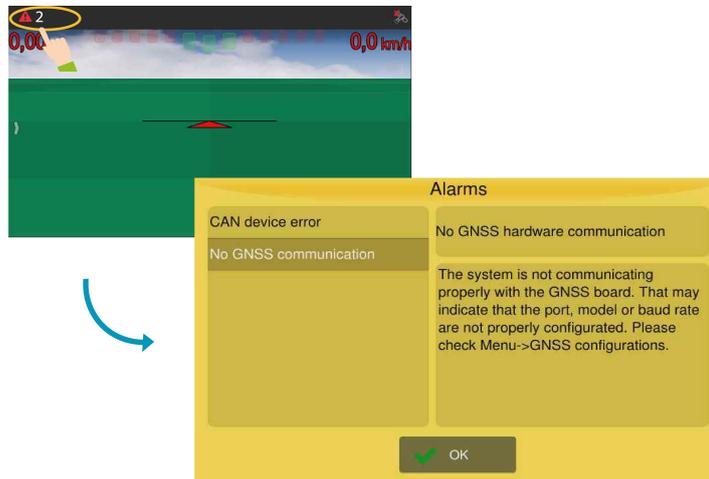


Figure - Alerts - Solutions

The following alarm categories are issued by the display:

- GNSS information;
- Odometer information;
- CAN information (connection to the drivers);
- Power supply;
- Anticide;
- Speed limit;
- Memory;
- Planting monitor;
- Auto steering;
- Fertilization;
- Seed controller;
- Sprayer;
- SIM Card;
- CPU temperature;
- Chat messages;
- Routes.

	Warning	Anti-lock alarms are issued when the temperature and/or memory reach critical levels. In this situation, the user is informed of the required procedure. In case the message is ignored, operation is suspended.
--	----------------	--

7.1.1.1 Alert descriptions

The display's alert table is presented below:

Name	Summary	Description
Monitoring alert	Rule violated	A monitoring rule has been violated. Contact your supervision.
High temperature	High system temperature	Operation suspended due to overheating. Turn off device, let it cool for a few minutes, and then turn it on again. Contact technical support if the problem persists.
Scale	Communication error	The system is unable to communicate with the weighing module. Ensure that the cable is connected and has not been damaged.
Incompatible Titanium database	Incompatible Titanium database	Incorrect version of the Titanium database, which may cause strange behavior and failure. If this occurs, please restore the factory settings to create a correct version.
Virtual fence	Out of bounds	You are outside the operating area. Please return to the allowed area.

GNSS connection	Disconnected GNSS antenna	Please ensure that the cable is properly connected.
Input controller	Outside the speed range	You are operating outside the speed range deemed appropriate for good input application. You may improve the speed range by changing the system calibration.
Input controller	Motor stopped	The system is unable to detect motor movement. Ensure that the hydraulic system is on, the motor speed sensor is connected, and no other alarms are active.
Input controller	No auxiliary power	The input control driver is not getting power to start the motor. Check the auxiliary power cord connections.
Input controller	Desired rate not reached	The system is unable to reach the recommended dosage. If you have not received an alert that the operations is outside the speed range, the calibration or the minimum and maximum motor speed parameters may be wrong.
Liquid controller	Outside the speed range	You are operating outside the proper speed range for good application. You can improve the speed range by altering the spray nozzle.
Liquid controller	Desired rate not reached	The system is unable to reach the spray recommendation. If you have not received an alert that the operation is outside the speed range, the selected nozzle may be incorrect or there may be a problem with the pump.
Seed controller	Outside the speed range	You are operating outside the proper speed range for good planting. You can improve speed range by changing the seed disks.
Seed controller	Motor stopped	The system is unable to detect motor movement. Ensure that the hydraulic system is on, the motor speed sensor is connected, and no other alarms are active.
Seed controller	No auxiliary Power	The seed control driver is not getting power to start the motor. Check the auxiliary power cord connections.
Seed controller	Desired rate not reached	The system is unable to reach seed recommendation. If you have not received an alert that the operation is outside the speed range, the calibration or the minimum and maximum motor speed parameters may be wrong.
Short-circuit	Short-circuit	A short-circuit has been detected involving the red/black power fires of either the CAN bus or the seed sensors. Ensure that the cables are not damaged.
Incompatible monitoring database	Incompatible monitoring database	Incorrect monitoring database version, which may cause strange behavior and failure. Please, update to an appropriate version. Insert a pendrive with an updated database and login with user hxgnguest (blank password). Go to Menu > System Settings > About > Update Database.
Manual anticide application error	Empty line	Please ensure that the anticide tank is not empty and the sensor is not obstructed.
CAN device error	Gate controller disconnected	The gate controller configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Controller disconnected	The input or seed variable rate controller configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Controller disconnected	The logic controller configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Anticide controller disconnected	The anticide controller configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Liquid controller disconnected	The liquid controller configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Section cut off	The section cut controller configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.

CAN device error	Transport driver disconnected	The transport module configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Planting monitor disconnected	The planting monitoring module configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Monitoring disconnected	The monitoring module configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Automatic pilot disconnected	The automatic pilot controller configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
CAN device error	Depth gauge disconnected	The depth gauge configured for this implement is disconnected. Ensure that the CAN bus cables are properly connected and that the module is not damaged.
Automatic pilot driver error	Initialization error	There was an error during driver sensor initialization. Please reboot the system completely. Contact technical support if the problem persists.
Anticide error	Empty line	Please ensure that the anticide tank is not empty and the sensor is not obstructed.
Communication failure	Communication failure	The system is not receiving client messages correctly.
GNSS - Low precision	Number of available GNSS satellites too low.	There are not enough satellites to determine the position. Please, ensure that the antenna and the cables are properly connected and unobstructed. The GNSS card may take a few minutes to sync.
GNSS - Low precision	No GLIDE	The GLIDE positioning system is inactive, which leads to low GNSS accuracy. The system takes six minutes after GNSS syncing to sync the GLIDE signal, but problems with the cable or antenna may cause GNSS malfunction.
GNSS - Low precision	No RTK	The system is not using RTK positioning, which leads to low GNSS accuracy. Ensure that the RTK base is on, the radio is connected, the baud is correct, and that there are no damages to the cables or the antenna. Upon receipt of the RTK corrections, the system may take up to ten minutes for proper positioning.
GNSS - Low precision	No SBAS	The system is not using SBAS positioning, which leads to low GNSS accuracy. Ensure that there are no damages to the cables or the antenna, and that the SBAS correction service is available in your region.
GNSS - Low precision	Inactive TERRASTAR	The system is not using TERRASTAR correction, which may lead to loss of overall GNSS accuracy. Please ensure that your TERRASTAR subscription is valid and has not expired. If you are using the subscription for the first time, it may take up to three hours to activate the TERRASTAR correction.
GNSS - Low precision	TERRASTAR-C not synced	The system is not using TERRASTAR-C correction, which may decrease GNSS accuracy. Ensure that the cables, antennas, and connections are properly connected. The TERRASTAR-C correction may take up to forty minutes to converge.
GNSS - Low precision	TERRASTAR-L not synced	The system is not using the TERRASTAR-L correction, which may reduce GNSS accuracy. Ensure that the cables, antennas, and connections are properly connected. The TERRASTAR-L may take up to five minutes to converge.
GNSS without communication	No communication with GNSS hardware	The system is not communicating correctly with the GNSS hardware, which means that the port, the model, or the baud (when available) selected in Menu > GNSS is incorrect. Select the correct data and click OK.
GNSS syncing	Syncing GNSS	The system is communicating correctly with the GNSS hardware, but is still syncing. The sync time should not be longer than ten minutes, given the antenna is outdoors, i.e., it is not under roofs, trees, electric transmission lines, or others that may interfere with the system. If the above conditions are met and the sync is still taking more than ten minutes, it may be indicative of a problem with the antenna whip or the

		antenna itself.
Guide	End of guide	The system is approaching the end of the guide. Get ready to maneuver the vehicle.
Guide - Loading	Guide is loading	The selected guide is loading. This alert will automatically disappear as soon as the guide is loaded and the automatic pilot is ready for use. Please wait.
Joystick	No joystick commands	The system is not reading joystick commands. Please ensure that the cables are properly connected.
Speed limit	Speed limit exceeded	The speed limit has been exceeded. Please slow down.
Login	Login before operating the vehicle	Please login before moving or operating the vehicle in any way.
Full memory	Insufficient memory	The available memory is insufficient thus the operation has been suspended. Close this work session and star a new one.
Insufficient memory	No available space	There is no space available thus the operation has been suspended. Export your flash files, then delete them from the system to free up space.
Satellite modem	Satellite modem not connected	Please ensure that the cable is properly connected.
Fertilizer monitor	Line without fertilizer	Ensure that the fertilizer bin is not empty and that the sensor is not dirty.
Seed monitor	Line without seeds	Ensure that the seed container is not empty and that the sensor is not dirty.
Monitoring – Incorrect task	Select new task	According to the parameters set, no task has been selected or the current task does not match. Indicate a new task on the monitoring screen.
Ntrip	Intermittent corrections	The Ntrip client connected successfully, but is not receiving enough corrections. Ensure that the Internet connection is working.
Ntrip	Disconnected	There was a problem connecting to the Ntrip server. Please go to the Ntrip status screen (Menu > GNSS > Ntrip Status) for more information.
Odometer	Close to the limit	The system is approaching the established distance limit. You must be careful not to damage the implement when the limit is reached.
Odometer	Limit reached	The system has exceeded the established distance limit. You must be careful not to damage the implement.
Autosteering pilot	Outside the speed range	You are operating out of the proper speed range.
Autosteering pilot	Displacement direction solution	The double antenna solution did not converge.
Autosteering pilot	Steer Direct communication	The automatic pilot driver is not receiving messages from the motor. Please ensure that the cables and connections are correct.
Autosteering pilot	Failure during alignment	The error or the angle in relation to the line is too high. Activate the device near the trajectory to be followed or change the safety parameters in the General Settings menu.
Autosteering pilot	No auxiliary battery	The automatic pilot is not receiving auxiliary power from the battery. Ensure the cables and connections are correct.
Autosteering pilot	Encoder hall reading	Inconsistent sensor reading.
Autosteering pilot	Electric pilot precision	It was not possible to estimate the vehicle trajectory. Please drive close to twenty meters performing smooth maneuvers.
Autosteering pilot	Unknown wheel position sensor	The system is unable to read the wheel positioning. The sensor may be disconnected or the cable may be broken. Check the installation of the wheel positioning sensor.
Autosteering pilot	Disengaged steering wheel	The vehicle s direction is not responding to the control. Ensure that the actuator is correctly installed
Autosteering pilot	Manual operation detected	The system has detected an external action on the steering wheel. If you did not move the steering wheel, it is possible that the sensitivity parameter is set incorrectly.
Autosteering pilot	Driver overheating	The activation system is overheating. This may be due to excessive stress or due to high external temperature. Modifications to the aggressiveness

		setting may decrease the heating.
Autosteering pilot	Communication failure	The system is unable to establish proper communication with the automatic pilot controller. Check the CAN communication cables.
Autosteering pilot	Shut off remotely	The automatic pilot button or footswitch has been triggered.
Autosteering pilot	Very rough terrain	The system is unable to maintain the trajectory due to excessive cabin swings. Ensure the inclination compensation module is securely attached.
Autosteering pilot	GNSS precision loss	The system has lost GNSS positioning accuracy. Ensure that there are no obstacles near the antenna.
Autosteering pilot - control message	Control message error	The automatic pilot system is not receiving GNSS information as expected. Please ensure that the GNSS is syncing before attempting to operate the automatic pilot.
Pneumatic	Pneumatic	Tire pressure not reached.
CAN port	Insufficient ports	The system is configured to use both the monitoring driver and the CAN ISOBUS, but only one CAN is available. Please reconfigure the system to identify which will be used.
Low memory	Little available memory	The system is operating with little available space. Export your flash files, then delete them to free up space.
Low memory	Little available memory	The system memory is almost fully occupied. If you proceed, the system will become slow. Exit the current work session and start a new one.
Plate	Plates are off	Ensure that the plate sensor is working properly and that the hydraulic is correctly engaged.
Sensor	Unresponsive sensor	The system is not reading the sensor. Please ensure that the cables and connectors are properly installed and/or the sensor is not damaged.
Critical level temperature	Critical system temperature	The system is overheating and the operation has been suspended. Turn the device off and contact technical support.
Low voltage	Power supply – low voltage	There is a problem with the battery to which the device is connected. The voltage is too low or with above normal oscillation. This is common while starting the tractor with the device turned on. In this case, it is recommended to start the tractor with the display turned off and only turn it on afterwards.
High voltage	Power supply – high voltage	There is a problem with the battery to which the device is connected. The voltage is too high or with above normal oscillation. This is common while starting the tractor with the device turned on. In this case, it is recommended to start the tractor with the display turned off and only turn it on afterwards.
Critically low voltage	Power supply – critically low voltage	There is a problem with the battery to which the device is connected. The voltage is low, which generally happens when the tractor is started with the device turned on. If this is the case, it is recommended to restart the tractor and then the controller.
External Wi-Fi	External Wi-Fi disconnected	The external Wi-Fi adaptor configured for this device is not connected. Please ensure that the adaptor is connected and not damaged.

7.2 Connectivity information

For further **GNSS information**, click on the icon located in the upper right corner.



Figure - Connectivity information

The information presented is:

- **GNSS**

Displays the total number of connected satellites. When pressed, it displays a window with details. When used Novatel models, shows the information on the location's accuracy, which allows more accurately identify the positioning of the vehicle. For information details, access topic [GNSS](#);

- **Mobile**

Indicates connectivity to mobile data networks. For details, access topic [Mobile data config.](#)

- **Cloud**

Indicates the display is online and authenticated on the Hexagon Agriculture services.

- **Wi-Fi**

Indicates whether or not the display is connected to a Wi-Fi network. When pressed, it displays details about the network connection. For configuration details, access topic [Wi-Fi](#).

- **Local**

Indicates whether the display is connected to the customer's local service.



Important

Only the options according to the configurations of each display and according to the contracted products will be visible.

7.3 Lightbar

The lightbar is displayed at the top of the operation screen and displays the deviation of the vehicle from the guide being executed. The squares represent the LEDs that light up when the configured offset is reached. Visually they light up right or left indicating the deviation side. The sensitivity in meters of the 5 center position LEDs are configurable by the operator, as shown in the [Parameters](#) topic.



Figure - Light bar in operation

7.4 Information configuration

Up to three pieces of information may be displayed on the operations screen.

To modify or enter the presented information, proceed as follows:

1. Click for two seconds on the information you want to change;
2. A new window will be presented with the possible options as shown in the figure;
3. Select the information you want to display;
4. The window is closed and the selected information is presented.



Figure – Information configuration



Important

If there is no information, just follow the same procedure above, pressing the empty space to select the information you want to display, as indicated in the center of the figure below. To do the inverse, simply select the empty information so that it disappears on the screen.



Figure – Insert and remove information

i Important To make the current time available on the operation screen, select **Time** as one of the information options.

7.5 Main menu

When dragging your finger from the left corner of the screen to the center, a tab will be displayed with the main menu buttons.



Figure – Options to the left of the screen

7.5.1 Guide

Guidance types are used to define a guideline on the field. The display operates with the following:

Icon	Description
	Wayline management
	Parallel line
	Parallel curve
	Adaptive curve
	Pivot
	Line A + Angle

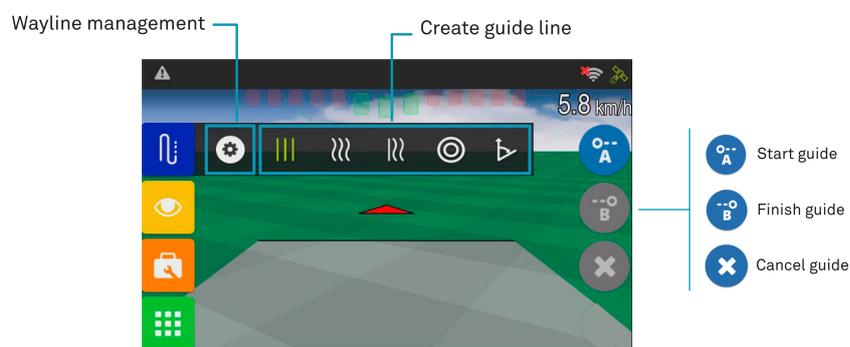


Figure - Guide creation

i Important For further explanations on each guide item, refer to topic [Guidance](#).

7.5.2 Visualization

By clicking on the **Visualization** option, the options for visual presentation of the job on the operation screen are presented.

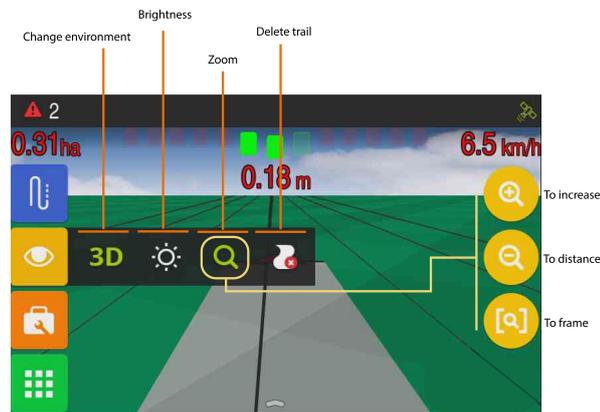


Figure - Visualization

Change environment

Alternates the visualization on the operation screen between 2D and 3D.

Brightness

Alters the brightness of the display screen.

Zoom

Increases or decreases the zoom on the operation screen.

You can zoom in and out of the maps using the pinch gestures, making it quicker and easier for the user to zoom in and out.

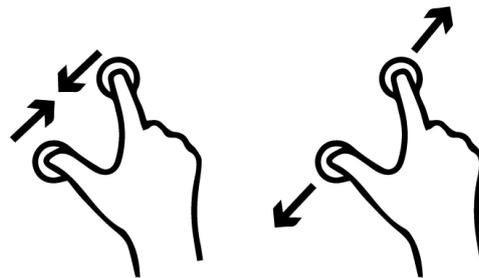


Figura - Pinch gesture

Delete trail

Clears the trace, total input, and deletes the area processed in the current session.

7.5.3 Tools

In the **Tools** option, functions related to perimeter and flag marking are available.

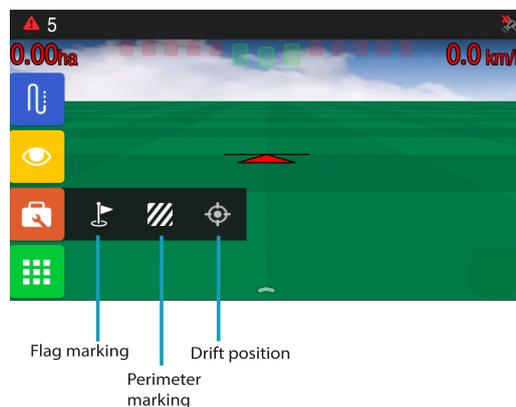


Figure - Tools

For further details, access the following topics:

- [Markers](#)
- [Perimeter](#)
- [Drift position](#)

7.5.3.1 Markers

In the **Tools** option, you can place flag-type markers on the map to mark the location of obstacles or other points of interest such as rocks, holes, anthills, and wet areas.

Icon	Description
	Marker function
	Create new marker
	Manage markers
	Create new marker layer

To use the markers, proceed as follows:

1. Press on the Marker option and then on the Flag icon to mark the desired location.



Important

In this option, the system will create the markers grouped in a layer with the default name given by the system. The marker name and color cannot be changed. If you want the mark in a layer with a specific name, you must select it in advance as described below.

To create different layers of markers with specific names, you must create them in advance before using them on the map. To do so, proceed as follows:

1. Press on the **Marker** option and then press the **Manage markers** icon;
2. In the layer manager, press option **Create new marker layer**;
3. Insert a new name for the layer and confirm. Example: anthills or holes. The name cannot be changed later;
4. The new layer is not displayed on the list;



Important

When you select the layer, you can see a drawing of the marker which indicates the color that the system associated with the layer. You cannot change the color. For each new layer, a new marker color is associated by the system.

5. Select the layer whose markers you wish to visualize on the field or to which you want to add a new marker and press **OK**;
6. On the operation screen, when you press the **Marker** icon a marker will be placed according to the color of the layer which was pre-selected in the manager.



Important

In the layer manager it is possible to select multiple layers at the same time to visualize all the markers on the Field. However, when you click on the flag icon, only one layer will be edited. The new marker will be created on the layer indicated with the pencil icon.

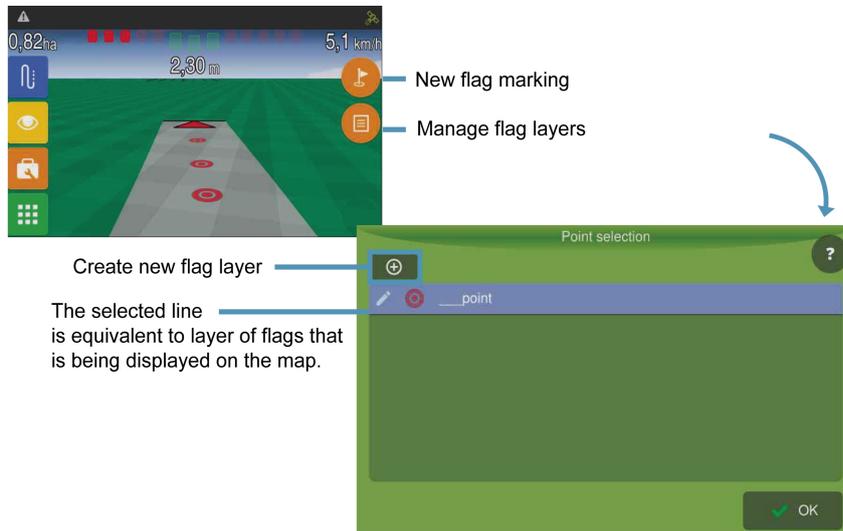


Figure - Flags



Important

It is possible to import/export the flag maps on the file transfer screen. For more information, check the [Files](#) chapter.

7.5.3.2 Perimeter

On the **Tools** option it is possible to delimit an area s perimeter. In order to do so, proceed as follows:

1. Press the **Perimeter** option and then press the option to **begin** marking;
2. Insert the name of the new **map** and press **OK** to confirm;
3. Inform the **lateral displacement** (m) for marking the perimeter and press **OK** to confirm;
4. The system will begin marking the perimeter;
5. When you finish marking, press the **stop** option;
6. The system will display a message to confirm creating the new map and the option to load it;
7. Press **OK** to load the map.



Important

For positive values, the line is moved outside of the farming machine s marking, and for negative values the line is moved inside the marking. For example, if you are operating a sprayer with an 18-meter bar from inside the field, add nine positive meters so that the sprayer passes over the line at the end of the field.

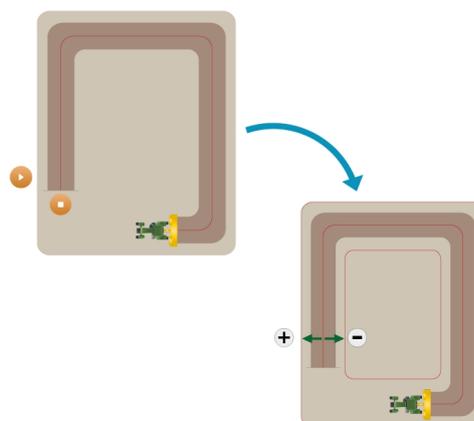


Figure - Perimeter



Important

The display will remove loops made while tracing the perimeter.

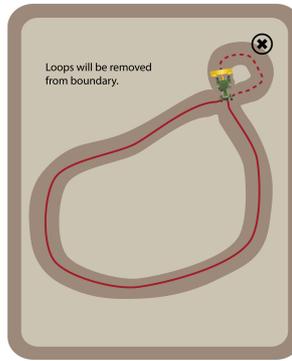


Figure - Removing perimeter loops

It is possible to import a ready-made perimeter file into the on-board computer, see the topic [Importing files](#).

7.5.3.3 Drift position

In the **Tools** option, it is possible to use the **Drift position** feature to demarcate a known field position and later use it to sync the GNSS position.

Icon	Description
	New marker
	Position adjustment
	Undo adjustment



Important

In order for the Drift position feature to be available, there must be a GNSS signal.



Important

In order to insert a new marker or perform the adjustment, the vehicle cannot be in operation or in motion.

New position

To mark a new position, proceed as follows:

1. Position the tractor where you want to add the marker;
2. On the Operation screen, select the **Tools** option;
3. Press the **Drift position** option;
4. Select the **New marker** option;
5. Select **Yes** to confirm the insertion;
6. The system draws a mark on the floor of the operation screen.



Important

Be sure to physically mark the demarcated location (by inserting a stake or other marking medium).

Position adjustment



Important

This option will only be available if there is a previously made mark on the field.

To adjust the position, proceed as follows:

1. Position the tractor on the same physical location on the field where the marked was inserted;

2. On the operation screen, select the **Tools** option;
3. Press the **Drift position** option;
4. Select the **Position adjustment** option;
5. The system will correct the GNSS position, bringing the marked to the indicated location.



Important

To use the position adjustment, the vehicle cannot be more than thirty meters from the marker.

Undo the adjustment



Important

This option will only be available in case the used has made a position adjustment.

To undo a position adjustment, proceed as follows:

1. On the operation screen, select the **Tools** option;
2. Press the **Drift position** option;
3. Select the **Undo position adjustment** option;
4. The system goes back to the GNSS position prior to the adjustment.

7.5.4 Configuration menu

On the **Configuration menu** all the application parameter settings are made available.



Important

To view all the available settings, alter the system mode to **Advanced**.



Important

When you start the system for the first time, only the **Vehicle**, **Implement**, and **Job section** options will be available. In order for the **Guidance**, **Auto steering pilot**, **Fertilisation control**, **Sprayer control**, and **Planting control** options to be active, it is necessary to activate the display and to register the vehicle and implement.

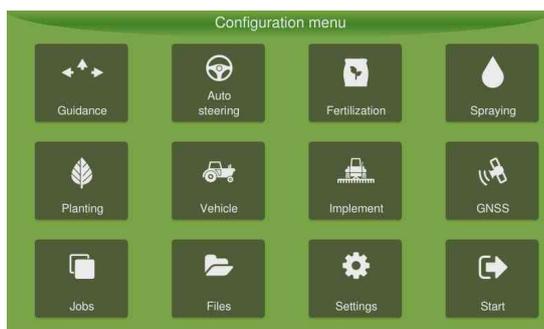


Figure - Configuration menu

Function	Description
Guidance	Guidance settings.
Auto steering	Auto steering settings.
Fertilisation control	Dosage or map settings and calibration of the fertilisation input.
Sprayer control	Dosage and spray nozzle settings .
Planting control	Planting settings .
Bait control	Bait control settings . This shows on the planting button position.
Vehicle	Selection of the vehicle to be used on the operation.
Implement	Selection of the implement to be used on the operation and for performing tests.
GNSS	GNSS settings . Inactive on normal mode.

Job section	Selection of the directory in which to save the data collected by the monitor.
Files	Selection of the location to extract the data and/or insert maps using a pendrive.
System settings	Shows the System settings .
Operate	Enters operation mode.

7.6 Context bar

Some system features enable a black bar at the bottom of the operation screen, usually displaying the controls and information for using these applications. To access the bar for a feature, proceed as follows:

1. On the **Operation** screen, with one touch, drag the bottom of the screen upwards;
2. The bar will be displayed.



Important

In case the operator is using more than one system feature that includes a bar, the current bar will need to be dragged from right to left in order to view the other feature bar, and so on.

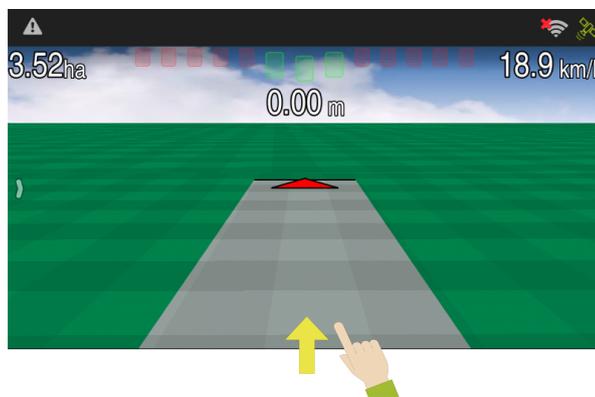


Figure - Drag touch



Figure - Feature bar

The following features/products present a bar:

- Auto steering;
- Bait control;
- Odometer;
- Fertilisation control;
- Planting monitor;
- Sprayer control;
- Machine monitoring.
-

8. GNSS



Important

The system mode must be set to Advanced so that the GNSS option is made available.

The GNSS settings are available on the **Configuration menu – GNSS**.



Important

The visible fields can be different according to the selected **GNSS** model.



Figure - GNSS

Port

Serial GNSS communication port. Three options are available:

- **Internal:** display GNSS module;
- **External:** external GNSS, model must be **External GGA** or **External RMC**;
- **Simulator:** for use with the internal GNSS simulator.

Minimum GNSS speed

Enter the minimum speed in which the vehicle will be considered to be in movement.

Model

Select the GNSS model used on your device. The available options are:

- **External GGA:** NMEA external GNSS. Messages provided and recommended frequencies: GGA (minimum 5Hz and desirable up to 20Hz), VTG (minimum 5Hz and desirable 20Hz), and ZDA (1Hz);
- **External RMC:** NMEA external GNSS. Messages provided and recommended frequencies: RMC (highest possible up to 20 Hz), GGA (1Hz), and ZDA (1Hz);
- **Max7/8:** L1 e GPS + Galileo + GLONASS para Max 8 e GPS + GLONASS para Max 7;
- **Max 8 BeiDou:** L1 e GPS + Galileo + BeiDou;
- **NTRIP:** OEM628 L1+L2 with NTRIP;
- **Novatel:** OEMStar L1 and Glide;
- **Novatel NO GLIDE:** OEMStar L1;
- **Novatel SBAS:** OEMStar L1+SBAS;
- **OEM617:** L1+L2 and Glide, dual antenna;
- **OEM617 NTRIP:** L1+L2 with NTRIP, dual antenna;
- **OEM628:** L1+L2 and Glide;
- **OEM628 PPP:** L1+L2 and Terrastar-C paid signal;
- **OEM628 PPP BASIC:** L1+L2 and Terrastar-L paid signal;
- **OEM628 SBAS:** L1+L2 and SBAS;
- **OEM7:** L1 and Glide (L2 available under activation);

- **OEM7 DUAL ANTENNA PPP:** TerraStar-C paid signal;
- **OEM7 DUAL ANTENNA PPP BASIC:** TerraStar-L paid signal;
- **OEM7 NTRIP:** L1+L2 with NTRIP;
- **OEM7 PPP:** L1+L2 e sinal pago Terrastar-LC;
- **OEM7 PPP BASIC:** L1+L2 and TerraStar-L paid signal;
- **OEM7 SBAS:** L1+SBAS;
- **OEM7 RTK:** L1+L2 with RTK;
- **RTK:** OEM628 with RTK;
- **Simulator:** simulator (external or internal, configurable through the door).



When using TerraStar-L, TerraStar-C, TerraStar-C Pro, RTK or NTRIP correction signals, an alarm will indicate that the accuracy is low if the correction service is not active or the position estimate has not yet converged.

Baud



This configuration will only be available when selecting the following GNSS models: **External GGA, External RMC, RTK, and OEM7 RTK.**



Figure - Baud

GPS simulator



This option will only be available in case selected the **Simulator** Model option.

In this option the desired file must be selected to run the simulation. The simulation is shown on the operation screen.



Figure - Simulator

Activate GNSS



Important

This configuration will only be available for all Novatel GNSS models (Novatel, Novatel NO GLIDE, Novatel SBAS, OEM617, OEM617 NTRIP, OEM628, OEM628 PPP, OEM628 PPP BASIC, OEM628 SBAS, OEM7, OEM7 DUAL ANTENNA PPP, OEM7 DUAL ANTENNA PPP BASIC, OEM7 NTRIP, OEM7 PPP, OEM7 PPP BASIC, OEM7 SBAS, OEM7 RTK, RTK).

Enter the activation code to release **GNSS** board models:



Figure - Activate GNSS

NMEA output



Important

This setting is only available for the Novatel and OEM (without RTK correction) GNSS models.

The NMEA output is a serial output that may be used to availability NMEA messages for the Novatel GNSS for external devices, see topic [NMEA output](#).

NTRIP output



Important

This setting will only be available for the NTRIP GNSS model, which in turn are only available for the display Ti10 device.

NTRIP is a RTK service for which the correction is transmitted through the Internet, using the available 3G or Wi-Fi networks. See topic [NTRIP](#).

Firmware update



Important

This configuration will only be available for all Novatel GNSS models (Novatel, Novatel NO GLIDE, Novatel SBAS, OEM617, OEM617 NTRIP, OEM628, OEM628 PPP, OEM628 PPP BASIC, OEM628 SBAS, OEM7, OEM7 DUAL ANTENNA PPP, OEM7 DUAL ANTENNA PPP BASIC, OEM7 NTRIP, OEM7 PPP, OEM7 PPP BASIC, OEM7 SBAS, OEM7 RTK, RTK).

This option is useful for manually updating the GNSS firmware:

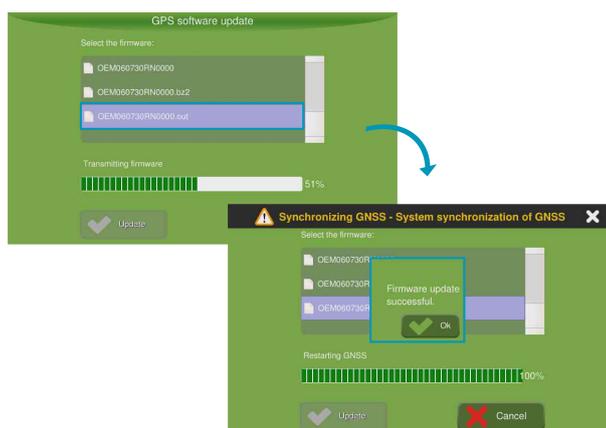


Figure - Firmware update



Important

When the device starts, if there is a firmware update available, the device will ask if you wish to update to the newest version.

RTK ASSIST



Important

This setting will only be available for the GNSS model OEM628 NTRIP, OEM628 RTK, OEM7 NTRIP and RTK..



Figure - RTK ASSIST

This option can be **Disabled** or **Enabled**. When enabled, it allows Novatel's GNSS models to maintain centimeter accuracy during a drop in connection with RTK data, usually caused by radio signal blind spots or cellular network connectivity interruptions. RTK ASSIST works until corrections are recovered, the 20 minute time limit is reached or the position accuracy decreases beyond a defined limit. The RTK ASSIST service is available by subscription.

Speed filter



Important

This setting will only be available for the GNSS model **Max7, Max7/8** and **Max8BeiDou**.

This option can be **Off** or **On**. Enables an intelligent speed filter. Very useful in regions with low visibility of satellites, and / or in high forests.



Figure - Speed filter

Steadyline



Important

This setting will only be available for the GNSS model with RTK/NTRIP.

This option reduces the position jumps that may occur when a GNSS receptor alters the positioning modes. This effect is visible when a receptor switches from a high-precision RTK position solution to a less accurate solution such as PPP (TerraStar), DGPS, SBAS + GLIDE, or even autonomous GLIDE™ and when the receiver retrieves the high precision solution. Smooth transitions are extremely important for precision farming applications, for which sudden jumps are damaging.



Figure - Steadyline

8.1 NTRIP server

NTRIP is a RTK service in which the correction is transmitted through the Internet, using the available 3G or Wi-Fi network.

 Important	The system mode must be set to Advanced so that the GNSS option is made available.
 Important	This configuration will only be available when selecting the GNSS models: NTRIP, OEM7 NTRIP or OEM617 NTRIP, which are available for AgrOn Ti10 equipment. RTK must be enabled, otherwise an alert will be displayed on the operation screen

To access NTRIP support, proceed as follows:

1. Press the **GNSS** option in the **Settings menu**;
2. In the **GNSS model**, select **NTRIP**, **OEM7 NTRIP** ou **OEM617 NTRIP**;
3. Select the NTRIP option that has been enabled.



Figure - NTRIP

- To find out the status of the NTRIP service, go to the [NTRIP Status](#) topic.
- To enter the NTRIP server data, go to the [NTRIP server](#) topic.

8.1.1 NTRIP status

NTRIP status: indicates whether or not NTRIP is connected. If it is disconnected, it informs the reason.

To check the status of the NTRIP, proceed as follows:

1. In **GNSS Model** select **NTRIP**, **OEM7 NTRIP** or **OEM617 NTRIP**;
2. Select the **NTRIP** option that has been enable;
3. Select the **NTRIP Status** option.



Figure - NTRIP Status

- **Status NTRIP**

- _ Connected;
- _ Connected - intermittent corrections;
- _ Disconnected;
- _ Incorrect username or password;
- _ Incorrect base (or too distant);
- _ Missing GGA messages;
- _ Not configured;
- _ Internal error or no connection.

- **Base position (lat,long)**

Indicates in which latitude and longitude position the NTRIP base is sending the corrections.

- **Timestamp correction**

Time of the last correction received from the base.

- **GGA timestamp**

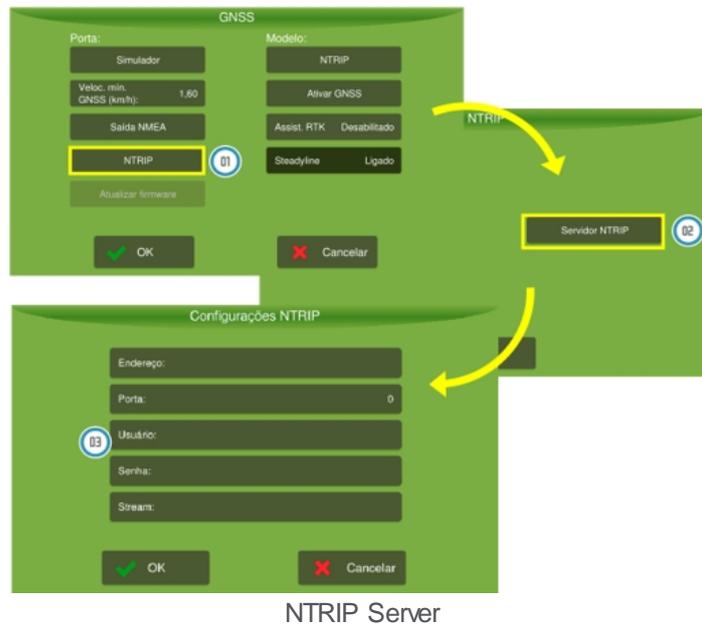
Time of the last vehicle position reference sent to the base.

8.1.2 NTRIP Server

NTRIP server: where the server connection data is configured.

To enter the NTRIP data, proceed as follows:

1. In **GNSS** Model select **NTRIP**, **OEM7 NTRIP** or **OEM617 NTRIP**;
2. Select the used option called **NTRIP**;
3. Select the **NTRIP** Server option;
4. Enter the **User** and **Password** data;
5. Enter the **Address** and **Port**;
6. In **Stream**, the nearest correction points will be listed. Select the desired location and press **OK**.



NTRIP Server

8.2 NMEA output

The NMEA output is a serial output that may be used to circulate NMEA messages for the Novatel GNSS for external devices.



Important

The NMEA output is unavailable for GNSS with RTK correction.



Important

The NMEA output uses the Serial 2 output of the chicoteTi10 display (Connector B), and a suitable cable is required.

To activate this output, proceed as follows:

1. In **Settings menu**, select option **GNSS**;



Important

The system mode should be advanced so that the GNSS option becomes available.

2. In **GNSS model**, select one of the **Novatel** (without RTK correction);
3. Select the **NMEA output** option that has become available;
4. The system will open the settings screen;



Figure - NMEA output

5. On the **NMEA output** screen, press the **Baud** option;
6. Select the output rate among the predefined values of 4800, 9600, 19200, 38400, 57600, and 115200bps and press **OK**;



Warning

Messages are restricted by the baud so that the port can always transmit messages without loss of characters.

- Select the output messages that must be sent and their transmission frequency, which will be restricted by the previously chosen *baud*. This will allow external devices to use this data, which have a standardized format, in their operation.

The message options are:



Important

The frequencies of 1Hz, 2Hz, 5Hz, 10Hz are available. For Novatel models of series 6 and 7 there is also the option of 20Hz.

- GGA;
- GSA;
- GST;
- GSV;
- RMC;
- VTG;
- ZDA.

- Ensure your information was entered correctly and press **OK**.



Important

The GSV messages send data from at most four satellites per message, so multiple messages may be needed for complete information.



Important

The compatibility module is available for the **OEM** and **Novatel** models.

The **Compatibility mode** is used to transmit the desired GAA correction quality parameter, regardless of the actual correction quality of the GNSS board. It is critical in order to work on third-party devices. Generally, planter controllers accept the NMEA signal, which reports the high-precision correction (RTK) quality and stops whenever the system changes for less accurate correction..



Figure - Compatibility mode

8.3 Operation

On the operation screen, through the connectivity symbols, it is possible to view the status of the GNSS system.

Ícon	Description
	Indicates that GNSS is active, synchronized and the accuracy is in accordance with the selected model.
	Indicates that the GNSS system is active, synchronized, but adequate accuracy has not yet been reached.
	Indicates that the GNSS system is active, but is not synchronized.



Indicates that the system is not communicating with the GNSS module.

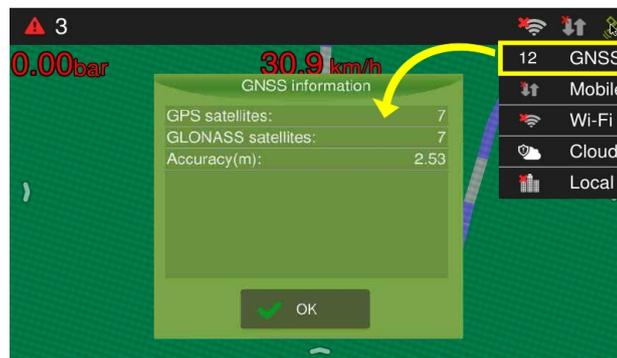
By pressing the **GNSS** icon, it is possible to view the total number of satellites connected to the system, and it is also possible to see a detail of the information.



Important

The information below is valid for Novatel receivers only and does not consider altitude, only horizontal coordinates.

When using Novatel models, information regarding location accuracy will be presented, which allows for more accurate identification of vehicle positioning. According to technical information about Novatel models on displays, horizontal accuracy is the probability that a measured point is within an area centered on the average coordinate over time. For this reason, the **Average Square Root Distance** (DRMS) is applied to define a 65% probability that this point will remain in this region and this value is calculated in all received position packages. This precision is used as a trigger to transition the GNSS synchronization status to converged.



Figurae - Details GNSS

9. Vehicle

To select a vehicle, proceed as follows:

1. Select the **Vehicle** option on the **Configuration menu**;
2. Select the desired vehicle on the box to the left of the screen;
3. Ensure the settings are correct and press **OK**.



Warning

Incorrect vehicle selection may compromise the entire validity of the work.



Figure - Vehicle selection



Important

If no vehicles have been created, it will not be possible to access the **Configuration menu** for the auto steering pilot.

9.1 Inserting a new vehicle



Important

Feature available only in **Advanced** mode.

To enter a new vehicle, proceed as follows:

1. Select the **Vehicle** option in the **Configuration menu**;



Figure - Vehicle

2. Select option **New**;



Figure - Entering a new vehicle

3. Select the **Vehicle type** and enter the required settings;
4. Confirm the operation selecting **Save**.

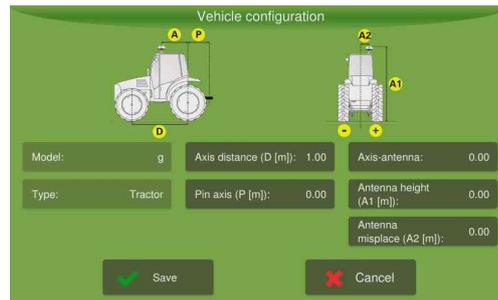


Figure - Vehicle settings

The following parameters must be set:

- **Wheelbase**
Distance, in meters, from the center of the rear axis to the Center of the front axis. Fundamental for calculating the control routine.
- **Antenna axis**
Distance, in meters, from the center of the rear axis to the antenna. Fundamental to the tilt compensation system, for approaching the line, and for working on the curved guides.
- **Pin axis**
Distance, in meters, from the center of the rear axis to the center of the rear pin.



Important

- For the treadmill tractor, the vehicle axis is considered to be at the center of the treadmill. Thus, this should be the starting point for measuring the distances to the center of the pin (P in meters) to the center of the antenna (A in meters);
- For the self-propelled, the distance from the axis to the pin equals the distance from the axis to the section closes to the spray bar. In this case, the pin axis in the implement s configuration should be zeroed;
- As for the truck, the axis distance equals the distance from the axis to the application line.

- **Antenna height**
Distance, in meters, from the ground to the center of the antenna. Fundamental for the tilt compensation system and for line parallelism.
- **Antenna offset**
Distance, in meters, from the antenna lateral offset. Fundamental for line parallelism.



Warning

Enter your vehicle measurements in meters. For measurements smaller than one meter, enter the value fractionally. For example, given a 60 centimeter measurement, enter 0.60. Before taking the measurements, ensure the vehicle is in level ground and in straight position, with the center line parallel to the wheels.

9.2 Editing the vehicle



Important

Feature available only in **Advanced** mode.

To edit a vehicle, proceed as follows:

1. Select the **Vehicle** option in the **Configuration menu**;
2. Select the vehicle you wish to edit on the list;
3. Select the **Configuration** option;

4. Alter the desired fields in the **Vehicle configuration** screen;
5. To confirm, select the **Save** option.

9.3 Removing the vehicle



Important

Feature available only in Advanced mode.

To remove a vehicle, proceed as follows:

1. Select the **Vehicle** option in the **Configuration menu**;
2. Select the vehicle you wish to remove;
3. Select the **Delete** option;
4. Confirm the operation selecting the **Save** option.



Figure - Remove vehicle

10. Implement



Important

Depending on the selected implement, features may be enabled or disabled on the display. For example, when selecting the Guidance, only the Guidance and auto steering pilot features will be enabled (in case there is a vehicle configured).

To select an implement, proceed as follows:

1. Select the **Implement** option in the **Configuration menu**;
2. Select the desired implement in the box to the left of the screen;
3. Ensure the settings are correct and press **OK**.



Figure - Implement selection

10.1 Inserting a new implement



Important

Feature available only in the **Advanced mode**.

To enter a new implement, proceed as follows:

1. Select the **Implement** option in the **Configuration menu**;
2. Select the **New** option;
3. Enter the initial implement data, such as **Type**, **Manufacturer**, and **Model** and press **Create**;
4. Enter the farming implement settings and press **Save**.

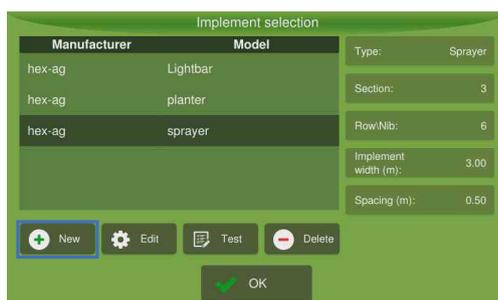


Figure - Entering a new implement



Figure - New implement config



Warning

Enter the implement measurements in meters. For measurements smaller than one meter, insert the value fractionally. For example, given a 60 centimeter measurement, enter 0.60. Before taking the measurements, ensure the implement is in level ground and in straight position.

For more details on the configuration of each implement, check the related activities:

- Sprayer implement configuration, see the topic [Configuring the sprayer implement](#).
- Fertilizer implement configuration, see the topic [Configuring the fertilizer implement](#).
- Linear actuator implement configuration, see the topic [Configuring the actuator implement](#).

10.2 Editing the implement



Important

Feature available only in **Advanced** mode.

To edit an implement, proceed as follows:

1. Select the **Implement** option in the **Configuration** menu;
2. Select the implement you wish to edit on the list;
3. Select the **Edit** option;
4. Alter the desired fields;
5. To confirm, select the **Save** option.



Figure - Implement edit



Important

If the implement is already created, some fields may be ready-only.

10.3 Removing the implement



Important

Feature available only in **Advanced** mode.

To remove an implement, proceed as follows:

1. Select the **Implement** option in the **Settings** menu;
2. Select the implement you wish to remove;
3. Select the **Delete** option;
4. Confirm the operation selecting option **Yes**.

10.4 Testing the implement

To have access to the tests related to an implement, proceed as follows:

1. Select the **Implement** option in the **Configuration** menu;
2. Select the implement you wish to test;

3. Select the **Test** option;
4. The system will present the test options for the selected implement.



Figure - Implement test



Important

For tests using the implement hydraulic motors, use the motor speed recommended by the manufacturer (e.g., 1800RPM for a tractor) in order to have a minimum 48l/min flow in the hydraulic system.

To view details about the tests, check the specific topics:

- Implement tests for the planting control activity, topic [Planting tests](#);
- Implement tests for the Formicide bait Control activity, topic [Formicide tests](#);
- Implement tests for the Fertilization Control activity, topic [Fertilization tests](#);
- Implement tests for the Spray control activity, topic [Spray tests](#).
- Implement tests for the Linear Actuator control activity, topic [Actuator tests](#).

11. Guidance

The navigation aid systems allow input economy and better use of the work area, once they minimize the overpass during input application and culture treatments.

They have the following work precisions up to 95% of the time:

Use this setting	For
GNSS L1 - GPS+Glonass	28 cm (15 min each pass)
GNSS L1/L2 - GPS+Glonass	15 cm (15 min each pass)
GNSS L1/L2 with TerraStar	4 cm (absolute)
RTK	2 cm (absolute)

11.1 Settings

The following settings are available:

- [Width \(in meters\);](#)
- [Sensitivity \(in meters\);](#)
- [Side overlap \(in meters\);](#)
- [Activity overlap: Yes or No;](#)
- [Overlap rate \(%\);](#)
- [Wayline settings;](#)
- [Reverse detector;](#)
- [Odometer: On or Off;](#)
- [Perimeter;](#)
- [Erase perimeter;](#)
- [Coverage info outside map.](#)



Figure - Guidance

11.1.1 Parameters

To alter the light bar parameters, proceed as follows:

1. Access the **Guidance** option from the **Configuration menu**;
2. Select the parameter you wish to alter;
3. Enter the desired values;
4. Press **OK** to confirm the operation.

The following parameters are available for setting:

- **Width (in meters)**
Indicates the width of the stride according to the selected implement.



Important

This parameter can only be altered here for the Guidance product. For the others products, the width must be altered directly on the implements settings.

• **Sensitivity (in meters)**

Specifies the offset required for a LED in the light bar to light up. This value is associated with the five LEDs in the center of the light bar. For the other LEDs, the on-board computer divides the rest of the stride width among each LED. To increase sensitivity, decrease the spacing and to decrease sensitivity, increase the spacing. Example: to enter a 15 centimeter sensitivity, enter 0.15.

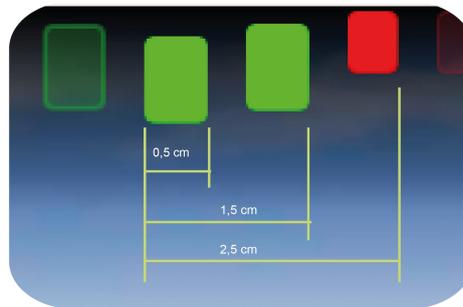


Figure - Lightbar sensitivity

• **Lateral overlap (in meters)**

Overlap the application (reassemble). Used mainly in sprayer implements.

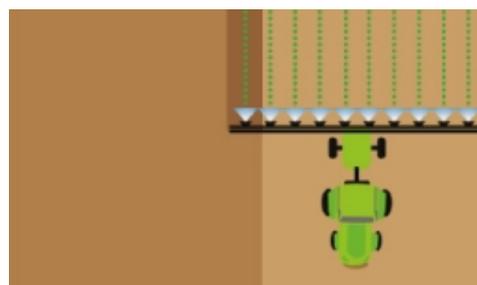


Figure - Lateral overlap

• **Activity overlap (Yes or No)**

Reapplies to an already treated area, overlapping the activity on the application map. For example, if an implement passes over an area where it has already been applied, it does not shut off and continues application normally, thus overlapping application in that area.

• **Overlap rate (in %)**

The **Overlap rate** parameter is only enabled when the **Activity overlap** is set to **No**. Insert the overlap percentage needed for the application or a section shuts off automatically. For example, if the overlap rate is adjusted at 50% and the section has a 4-meter length, when 2m of overlap are reached, the implement will shut off. The **Overlap rate** is calculated based on the implement width.

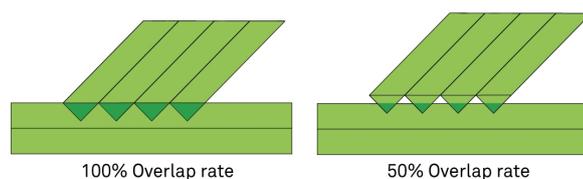


Figure - Overlap rate



Important

The **Overlap rate** parameter must be set even if **No** is selected for the overlap, because there is an acceptable rate that the implement cannot avoid so that it can detect that it is over an already treated area.

11.1.2 Wayline settings

This screen is divided into two types of settings. It contains the settings for saving the guide in the operation, and also for the parameters used for curves and maneuver detection, as described in the following topics.

- The user can determine the standard way he wants the display to save a new guide that is generated. See the [Saving mode](#) topic.
- The user can determine the operating logic of the **Realign** option, used on the operation screen with an active guide. See the [Realign configuration](#) topic.
- The user can determine the operating logic of the Nudge option, used on the operation screen with an active guide. See the [Manual adjustment](#) topic.
- The user can configure the automatic detection parameters for the equipment to use when generating a guide. See the [Advanced settings](#) topic.



Figurae - Guide settings

11.1.2.1 Saving mode

The type of guide saving must be previously defined. To define the way the guides are saved, proceed as follows:

1. Select the **Guidance** option in the **Configuration menu**;
2. Select the **Wayline settings** option.
3. Select the option in the frame on the left.



Figure - Save mode

The following saving options are available:

- **Automatically save**
By selecting this option, the system will automatically save the guide without asking the user for a name. A name is given by the system comprising a numeric system containing the date followed by other numbers.
- **Never save**
By selecting this option the system will never save the created guide. This way, the guide will be available for saving as a temporary guide.
- **Always ask**
By selecting this option, the system will always ask if you want to save the guide. An option to edit the filename will open and you will be able to save the guide.

11.1.2.2 Realign mode

The **Realign** option is presented on the operation screen, when working with an active guide, see the topic [working with an](#)

[active guide.](#)

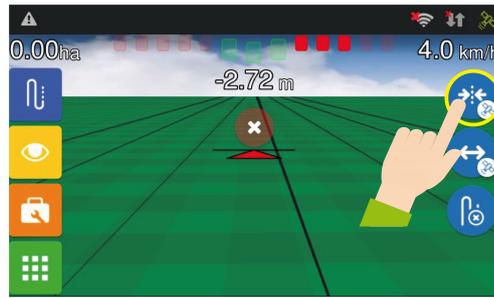


Figure - Realign

Two different behaviors are possible when selecting this option, it is necessary to previously configure the default behavior as described below.

To define the behavior of the realignment option, proceed as follows:

1. Select the **Guidance** option in the **Configuration Menu**;
2. Select the option **Guidance settings**;
3. Select the default option in the middle frame.



Figure - Guidance settings

The following behavior options are available:

- **Move the guide position by moving the GNSS position**

This option is selected by default. In this option when the **Realign** button is clicked on the operation screen, the equipment adjusts the position of the GNSS of the guide to the current position where the vehicle / antenna is located, thereby moving the guide to the zero error position.



Important

In this option, as the positions of the guides are changed, it is not possible to return the position of the original guide. If you intend to work again in the area already applied using the same guides, it is advisable to use the other behavior that would be to realign by moving the position of the guide.

- **Move the position of the guide by creating a new guide**

When the user selects this behavior, when selecting the **Realign** button on the operation screen, the equipment will draw a new original guide similar to the previous one in the same location where the vehicle / antenna is located and new parallels will be drawn. The previous original guide can be accessed again in the guide manager, if it has been saved.



Important

In this option, the visual result for the user is the same as the previous option, the movement of the guide aligned to the vehicle, but here in fact a new guide was created.

11.1.2.3 Manual adjustment mode

The **Manual adjustment** option is presented on the operation screen, when working with an active guide, see the topic [working with an active guide.](#)

Two different behaviors are possible when selecting this option, it is necessary to previously configure the default behavior as described below. This option is similar to **Realign**, but instead of using the vehicle/antenna location for the adjustments, here they are made according to the values and direction manually indicated by the operator.

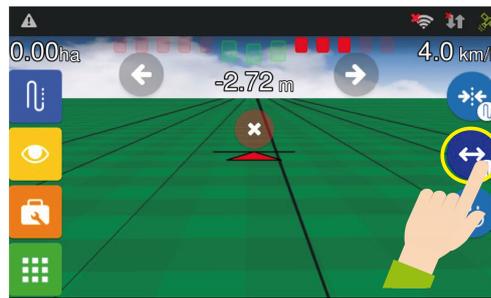


Figure - Manual adjustments

To define the behavior of the realignment option, proceed as follows:

1. Select the **Guidance** option in the **Configuration Menu**;
2. Select the option **Guidance settings**;
3. Select the default option in the right frame.



Figure - Guidance settings

The following manual adjustment options are available:

- **Guide adjustment by changing the position of the GNSS**

This option is selected by default. In this option when the **Manual adjustment** button is activated on the operation screen, the equipment has manual controls so that the operator can adjust the position of the GNSS, the adjustment is made every **2 centimeters** to the side indicated by the user.



Important

The position of the GNSS is adjusted and the original guide and its parallels remain the same of the guide.

- **Guide adjustment by changing the position of the guide**

When the user selects this behavior, when selecting the **Manual Adjustment** button on the operation screen, the equipment has manual controls so that the operator can move the guide in the direction and distance he wants. In this case, a new original guide similar to the previous one will be created according to the side and distance indicated by the operator and new parallels will be drawn. The previous original guide can be accessed again in the guide manager, if it has been saved.



Important

The position of the guide is adjusted, creating a new original and parallel guide.

11.1.2.4 Advanced configuration

To change the **Curve configuration**, proceed as follows:

1. Access the **Guidance** option in the **Configuration menu**;

2. Select the **Guidance settings** option;
3. Select the **Advanced settings** option;
4. Enter the values for the curve configurations;
5. Press **OK** to confirm the operation.



Figure - Guidance settings

The following parameters are available for setting:

01 - Maneuver detection

The maneuver detection settings affect how the device detects that the vehicle has performed a **U** movement to exit a guide line and enter another. This detection is used to automatically determine modifications to the adaptive guide, thus saving operator actions.

- **Angle delta (degrees)**
Determines the vehicle direction variation relative to the guide line needed to characterize exiting that guide line.
- **Distance (meters)**
Is the limit to the **U** movement distance that can be removed automatically.

For example, the display will consider that the operator finalized capturing the adaptive curve and will generate new lines based on the new reference as soon as the vehicle direction varies more than 100 degrees (delta angle) in the last 15 meters (distance).

It is important to note that the course during the **U** movement will automatically be removed and will not be present in both the modified guide line and its parallel lines.

02 - Adaptive detection



Important

The process of modifying the current guide line when an adaptive guide line is used requires the operation to be enabled. If it is not, the process will never begin. If it is disabled after modification begins, it will be finalized and incorporated into the current guide line and its parallels.

- **Error (meters)**
Expected error to consider capturing a new line.
- **Distance (meters)**
Distance to consider capturing a new line.

Situation 1

For the **adaptive detection**, the operator enters the parameters used to begin and end capturing a new modification of the

adaptive curve. For example, using the data in the figure, as soon as the operator drives over 5m (**Distance**) with an error lower than 0.3m (**Error**), the approximation to the guide line will be classified as successful and the display will begin capturing the modification of the guide line.

Situation 2

However, this will not be visible to the operator yet. After this initial stage, if the vehicle drives over 5m (**Distance**) with an error larger than 0.3m (**Error**), the user's intention of modifying the current guide line will be detected and the new trajectory will be visible along with the old guide line.

Situation 3

If the vehicle drives over 5m (**Distance**) with an error lower than 0.3m (**Error**), it will be detected that the operator deviated from an obstacle and wished to return to the old guide, so the capture will be finalized and the guide line will be modified, as will its parallels.

03 - Curve detection

Parameters for filtering (pilot navigation) and smoothing the guide lines obtained when using adaptive guides and curves.

- **Between points**

For this parameter, instead of using all the saved points to generate the reference path, the display will generate a smoother path by keeping a distance between consecutive points as indicated in the **Between points** field. High values may prevent closed curves (small radii) from being considered when generating the final path.



Important

The value of this parameter will only be considered when the **Activate distance filter** option is selected.

- **Spline points**

This parameter smoothes the final trajectory by inserting intermediary points on the curve to be shown to the operator. The value does not affect the pilot's behavior, however increasing it causes a larger processor load and slowness in calculating the parallel lines. The recommended value is 3.

- **Noise filter**

With this parameter the final path is smoothed by eliminating noise and vibrations obtained while capturing the desired guide. Reducing this value will yield a smoother path, which will make the pilot perform softer maneuvers as well. However, the path may be different from expected. Increasing the value, the filtration is reduced, yielding a path closed to the actual points obtained while capturing the guide. However, noise and vibrations in the points will not be removed, which may result in abrupt maneuvers.



Important

The value for this field will only be considered when the **Activate noise filter** option is selected. Typical values vary between 10 and 20.

- **Minimum radius**

This value corresponds to the smallest curve radius that can be comfortably made without causing damage to the vehicle or implement. In this field you can enter a radius value more appropriate for your vehicle. For example, in generating a new curve, in case there is a trajectory with a radius smaller than this value, the display will smooth the affected area to make it possible for the pilot to pass.



Important

Check the vehicle's manual for the smallest radius allowed. The minimum allowed for this field is 1.00, and a typical value is around 10.00.

- **Activate distance filter**

If this option is enabled, the device will take into account the **Between points** value, otherwise it will be ignored.

- **Activate noise filter**

If this option is enabled, the device will take into account the **Noise filter** value, otherwise it will be ignored.

11.1.3 Reverse detector

Enable this function to detect when the vehicle is in reverse.

To alter the automatic reverse detection settings, proceed as follows:

1. Access the **Guidance** option from the **Configuration menu**;
2. Select the **Reverse detector** option;
3. Press the **Detect reverse** option to alternate between **Yes** and **No**;
4. Press **OK** to confirm the operation.

 Warning	For using the automatic pilot, the reverse detector must be activated.
 Important	In case you want to inform the display that the reverse direction is inverted, simply select the Invert direction option.
 Important	It is recommended to keep the Reverse detector active for correctly marking the trail.

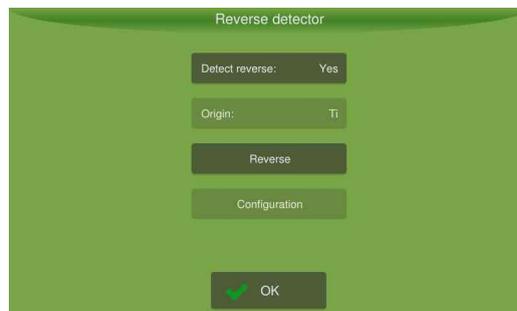


Figure - Reverse detector

On the operation screen, while the display detects reverse, a red backwards arrow will show. When the display is detecting forward movement, a green forward arrow will show for ten seconds, as shown in the figure below.

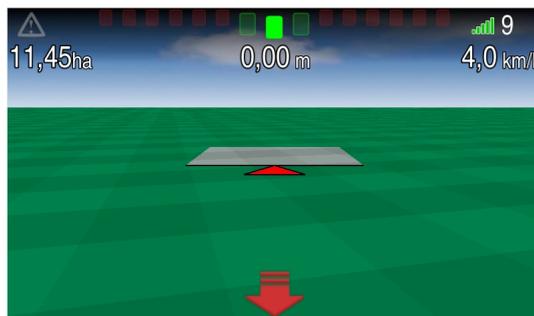


Figure - Reverse detector in operation

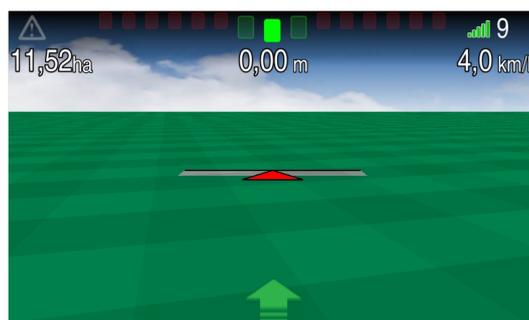


Figure - Operation



Warning

If the implement is performing the opposite motion to that indicated by the arrows on the screen, the operator must simply press the arrow to indicate that the movement is inverted. The occurrence of a false movement is more common at first GNSS syncing or after the vehicle has been stationary for a long time. However, it can occur even with the vehicle in motion.

11.1.4 Odometer

The **Odometer** function is intended to measure the distance traveled by the vehicle using the GNSS positions and allows controlling the applied area by loading maps into the system.

In sugarcane mills, for example, it is used to control the stretch of the vinasse hoses, avoiding the need for markers (flags) and eliminating the risk of breakage. To enable or disable the odometer, proceed as follows:

1. Access the **Guidance** option from the **Configuration menu**;
2. Select the **Odometer** option to alter between **On** and **Off**;
3. Press **OK** to confirm the operation.



Important

To learn how to use the odometer and its features in operation, check topic [Monitoring the operation](#).

The odometer's function is to measure the distance traveled. The number that shows indicates the distance already traveled by the vehicle and the range below shows the relation between traveled and total distance. The range will be green while the distance is normal, yellow when the traveled distance reaches the alert range and red when the distance exceeds the maximum limit. Pressing the alarm icon (bell), the operator may indicate the distance for which an alert is emitted. Pressing the ruler length icon (ruler), the operator may indicate the total route distance. The reset icon zeros the odometer to start over.

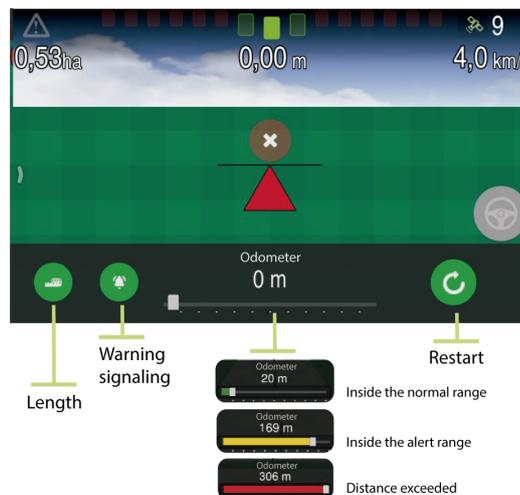


Figure - Odometer

11.1.5 Perimeter

The **perimeter** function is used to load the saved perimeters.



Important

In order for the **Perimeter** and **Clear perimeter** options to be enabled, the **Guidance** option must be selected first. The **perimeters** are saved through the operation screen, on the **Tools** menu.

To load a perimeter, proceed as follows:

1. Access the **Guidance** option from the **Configuration menu**;
2. Select the **Perimeter** option (item 01);
3. Among the items available, select the perimeter you wish to load (item 02);
4. Press **OK** (item 03);
5. Press **OK** to confirm the operation.

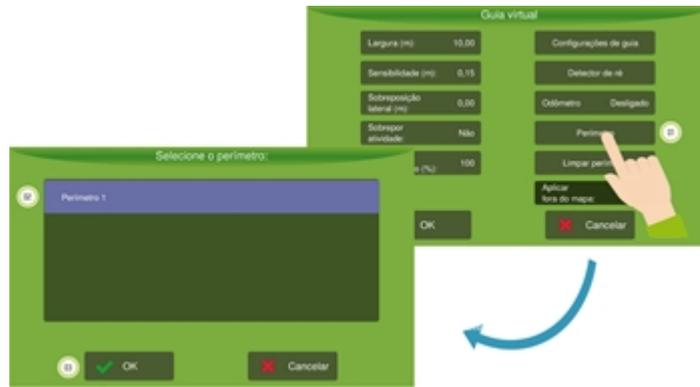


Figure - Select perimeter

To clear the loaded perimeter, select the **Clear perimeter** option.

11.1.6 Apply outside map

The **Apply off the map** function is used to indicate whether the application should exceed the perimeter limits or not.

- **On**
The equipment will not cut the application when leaving the area of the defined perimeter.
- **Off**
The application will be suspended automatically when the vehicle exceeds the perimeter limit.

To change the configuration, proceed as follows:

1. Access the **Guidance** option from the **Configuration menu**;
2. Select the **Apply off the map** option to alter between **On** and **Off**.

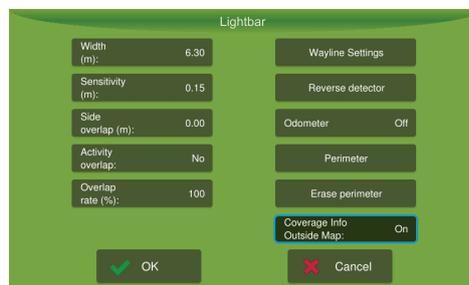


Figure - Apply off the map

11.2 Operation

The operation is started by selecting the suspended operation option in the center of the operations screen.

i Important

The application will only begin when the implement moves and exceeds the minimum speed set for the **GNSS**.

Select the type of operation you desire, see the available types on the following topics.

11.2.1 Creating a guide line

i Important

Before starting the operation, it is important to ensure the vehicle and implement dimensions are correct.

! Warning

In order for the guide to work properly, the GNSS must be operating properly. Do not start while the "GNSS Syncing", "GNSS without communication", "No Glide", or "No RTK" alert show, or while the device is connected to less than four satellites.

Guidance types are used to define a guide line in the field. Display operates with:

- Parallel line;
- Parallel curve;
- Adaptive curve;
- Pivot;
- Line A + Angle.



Warning

To set the way of saving the guide, visit topic [Guide settings](#).

11.2.1.1 Parallel line

The A-B linear trajectory is used to define a line in the field to which all work lines will be parallel.

Configuring trajectory

Icon	Description
	Guide
	Parallel line
	Point A
	Point B

To draw the guide line, proceed as follows:

1. On the operation screen, select the **Guide** option on the left side menu;
2. Select the trajectory mode as **Parallel line**;
3. Position your vehicle on the field over the point where you wish to start and press **Point A** to mark the beginning of the line;
4. Drive until the end point on the field and press **Point B** to mark the end of the trajectory.



Warning

The smallest distance between points of line A-B is of 30 meters. The longest distance between points A-B will be 20km.



Important

You can cancel a guide creation by selecting the option with an "X" at any time.

At the end of this procedure, the reference line 0 (zero) is created, as well as the parallel lines on both sides of the reference. Lines to the right will be positive (+) and lines to the left will be negative (-). Consider that point A is behind the vehicle and point B is ahead. Even if you do not drive straight between points A and B, the references to this guide will be taken only from two points marked.

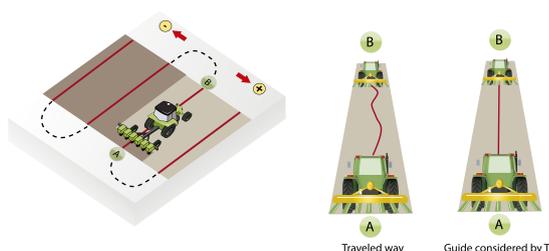


Figure - A-B line

11.2.1.2 Parallel curve

Parallel curve A-B is used when you wish to work on an area with smooth curves. This option stores the actual trajectory you made between points A and B, instead of creating a straight line between them. All following guide lines will be parallel

to the original curve. The current curve and the parallel curves immediately to the right and to the left are shown

Configuring trajectory points

Icon	Description
	Guide
	Parallel curve
	Point A
	Point B

To draw the guide, proceed as follows:

1. On the operation screen, select the **Guide** option on the left side menu;
2. Select the trajectory mode as **Parallel curve**;
3. Position your vehicle on the field over the point where you wish to start and press **Point A** to mark the beginning of the curve;
4. Drive to the end point on the field and press **Point B** to mark the end of the trajectory.

	Warning	The smallest distance between points A and B is of 30 meters. The longest distance between points A-B will be 20km.
---	---------	---

	Warning	In case reference curve A-B intersects with itself, a closed circuit will be created with the curve inside the intersection.
---	---------	--

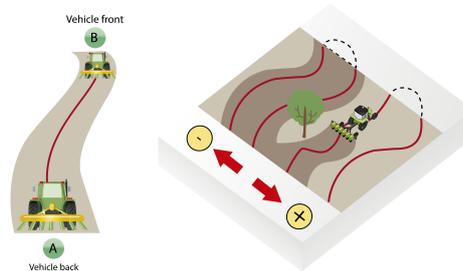


Figure - Parallel curve

11.2.1.3 Adaptive curve

The adaptive curve pattern provides guidance along the curve and updates the orientation after each curve considering the deviations that have been made. To record a deviation, it is necessary to be inside the set adaptive detection requirements. The device continuously records the course and provides guidance to match the last course performed.

Configuring trajectory points

Icon	Description
	Guide
	Adaptive curve
	Point A
	Point B

To draw the guide line, proceed as follows:

1. On the operation screen, select the **Guide** option on the left side menu;
2. Select the trajectory mode as **Adaptive curve**;
3. Position your vehicle on the field over the point where you wish to start and press **Point A** to mark the beginning of the curve;
4. Drive to the end point on the field and press **Point B** to mark the end of the trajectory.



Warning

The smallest distance between points A and B is of 30 meters. The longest distance between points A-B will be 20km.

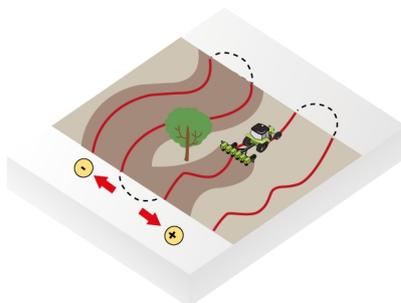
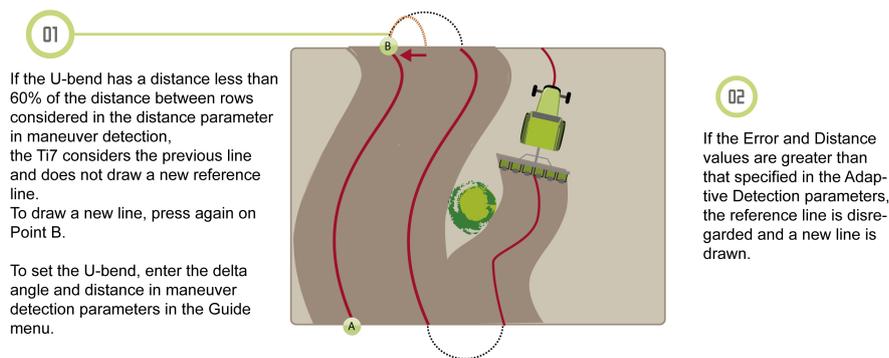


Figure - Adaptive curve



01
If the U-bend has a distance less than 60% of the distance between rows considered in the distance parameter in maneuver detection, the TI7 considers the previous line and does not draw a new reference line.
To draw a new line, press again on Point B.

To set the U-bend, enter the delta angle and distance in maneuver detection parameters in the Guide menu.

02
If the Error and Distance values are greater than that specified in the Adaptive Detection parameters, the reference line is disregarded and a new line is drawn.

Figure - Adaptive curve considerations

11.2.1.4 Pivot

Use the pivot guidance mode in areas that use central pivot irrigation. With this option, the work lines are concentric circles defined by three route points.

Configuring the trajectory points

Icon	Description
	Guide
	Pivot
	Point A
	Point B
	Point C

To draw the guide, proceed as follows:

1. On the operation screen, select the **Guide** option on the left side menu;

2. Select the trajectory mode as **Pivot**;
3. Position your vehicle at the beginning of the curve trajectory;
4. Press **Point A**;
5. Drive to route point B and press **Point B**;
6. Drive to route point C and press **Point C**.



Figure - Pivot

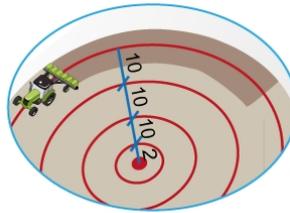


Figure - Curve generation

Points A, B, and C may be pressed at any point in the circumference. Parallel circumferences are generated from the one determined by the points ABC, according to the implement width.

11.2.1.5 Line A + Angle

The Line A + Angle trajectory is used to define a line in the field to which all work lines will be parallel and is defined through an initial route point and an angle with north or with an existing guide.

Configuring trajectory points

Icon	Description
	Guide
	Line A+Angle
	Point A

To draw the guide line, proceed as follows:

1. On the operation screen, select the **Guide** option on the left side menu;
2. Select the trajectory mode as **Line A + Angle**;
3. Position your vehicle on the field over the point where you wish to start;
4. Press the **Point A** to have access to the configuration screen for the reference angle;
5. It is possible to choose as reference guide North or a previously saved guide;
6. If you choose north as the reference, it is necessary to inform the deviation angle for creating a new guide. The angle is a value from 0 to 360, where 0 points to the North;
7. If you choose the existing guide field, it is necessary to choose one of the listed guides and then enter the deviation angle for creating a new guide. The angle is a value from 0 to 360, where 0 refers to the chosen guide;
8. Press **OK**.



Important

The saved guides that may be used as reference are only those of type Parallel line A-B.

At the end of this procedure, a reference line 0 (zero) is created, as well as parallel lines in both sides. Lines to the right will be positive (+) while lines to the left will be negative (-).

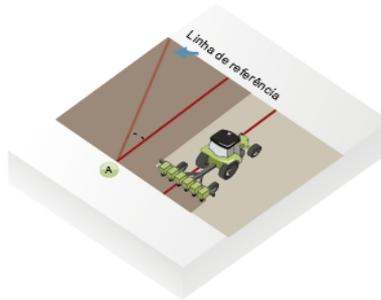


Figure - Line A + Angle

11.2.2 Working with an active guide



Important

The **Realign**, **Manual adjustment**, and **Disable guide** options will only be visible when a guide is loaded into the field.

Icon	Description
	Realign the position of the GNSS (antenna / vehicle)
	Realign the guide position (antenna / vehicle)
	Manually adjust the position of the GNSS (2 in 2 cm)
	Manually adjust the position of the guide (distance informed)
	Disable active guide

11.2.2.1 Realign

The **Realign** function can have two different behaviors according to what the user has configured, see the [realignment configuration](#) topic.

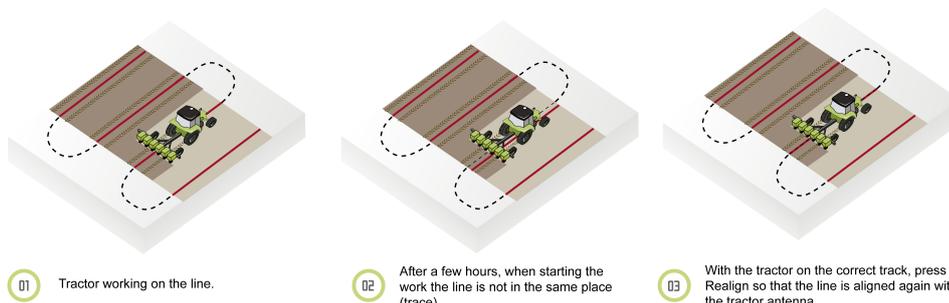


Figura - Realign procedure

Realign the guide by moving the GNSS position

The GNSS system is subject to information variation. It is recommended to use the **Realign GNSS** function if, after pausing the operation for a while, the guide does not show the same location as before when you start over again. This function transfers the GNSS position guide automatically until the point where the antenna/vehicle is, aligning it with the guide (zero error).

To perform a realignment GNSS adjustment, proceed as follows:

1. With the guide active, click on icon **Realign (with GNSS image)**;
2. The guide is adjusted according to the vehicle's antenna position.

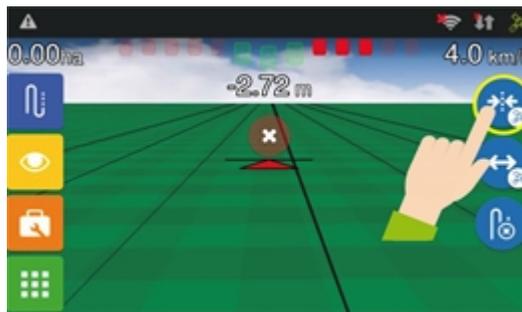


Figure - Realign GNSS



Important

In this option, as the positions of the guides are changed, it is not possible to return the position of the original guide. If you intend to work again in the area already applied using the same guides, it is advisable to use the other behavior that would be to realign by creating a new guide.

Realign the guide by creating a new guide

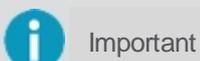
A new original guide similar to the previous one is drawn in the same location where the vehicle / antenna is located and new parallels will be drawn. The previous original guide can be accessed again in the guide manager, if it has been saved.

To perform a realignment guide adjustment, proceed as follows:

1. With the guide active, click on icon **Realign (with guide image)**;
2. A new guide appears at the vehicle's antenna position.



Figure - Realign guide position



Important

In this option, the visual result for the user is the same as the previous option, the movement of the guide aligned with the vehicle, but here in fact a new guide was created and using the previous original guide it is possible to repeat the work in the field.

11.2.2.2 Manual adjustment

Move the guide by manually adjusting the GNSS position

Field displacement is used to move the line 2 cm at a time to the right or to the left. It is recommended when it is necessary to make a fine adjustment to the line that may have dislocated.



Important

As the position of the GNSS is changed, it is not possible to access the original guide again, if the intention is to reuse the guides to do another job in the area already worked, use the other option for this button, which creates a new guide.

To displace the field guide, proceed as follows:

1. With the guide active, press option **Manual adjustment**;
2. Arrows for adjusting the displacement will be presented on the top of the screen;
3. Pulse the arrows for the desired direction.



Important

Each time the arrow is pressed, the line is moved 2cm to the chosen side.

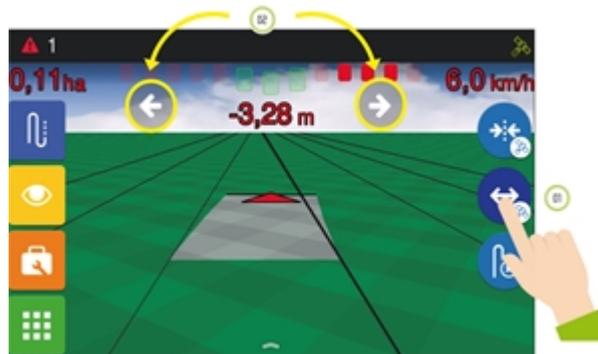


Figura - Manual adjustment GNSS

Move the guide by manually adjusting the position of a new guide

Manual guide adjustment is used to create a new guide according to the user-defined value to the left or right. Recommended when it is necessary to make a larger adjustment on the line.

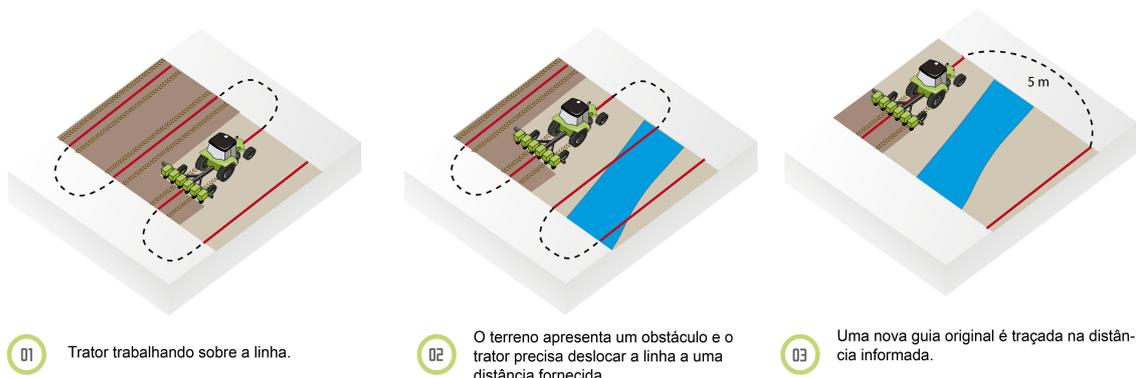


Figure - Manual adjustment procedure

To displace the field guide, proceed as follows:

1. With the guide active, press option **Manual adjustment**;
2. Arrows for adjusting the displacement will be presented on the top of the screen;
3. Press the arrows for the desired direction for 1 second.
4. Enter in the keyboard the distance you want the guide to be moved in that direction.
5. Press **OK** to confirm the operation.



Important

In this case, a new guide similar to the original is being drawn in the indicated location.



Figure - Manual adjustment guide

11.2.2.3 Disable guide

This option is used to disable a guide that is active.



Important

This button does not delete the guide from the system, it only unloads it from the field so that the user can create a new guide or load another one from the **Guide manager**.

To unload a guide from the field, proceed as follows:

1. With the guide active, press the **Unload guide** option;
2. An option asking if you wish to deactivate the guide will be shown;
3. Select **Yes** to confirm the operation.



Figure - Disable guide

11.2.3 Managing guides

The **Wayline management** screen allows managing some functions, such as:

- View information on a guide;
- Load a previously saved guide to the field;
- Save a temporary guide. See topic [Save guide](#);
- Import a guide. See topic, [Import guide](#);
- Export a guide. See topic [Export guide](#);
- Edit a guide s name. See topic [Edit a guide s name](#);
- Delete a guide. See topic [Delete guide](#).

Guide list

On the management screen it is possible to visualize the list of guides that have been created in all work sessions on the

same field.



Important

All guides created for the same field from the current work session are visible, so it is possible to use a guide saved in another work session but for the same physical location.

When selecting a guide from the list, the system presents the following information on it:

- Guide name;
- Name of the farm where the guide was created;
- Name of the field where the guide was created;
- Guide type;
- Data of creation of the guide.

By clicking on the **View details** option, you are able to preview the guide according to its type (curve, angle, or pivot, for example). On the list it is possible to recognize the **Active guide** on the field through the icon marked with a lightning image.

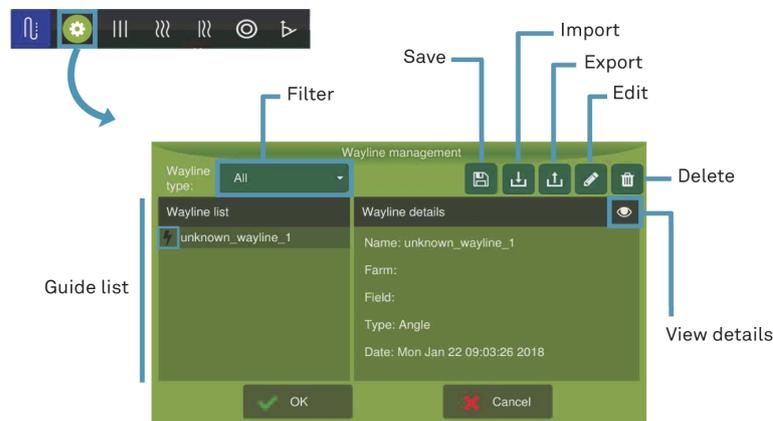


Figure - Guide management

The visualized guides may be filtered by **Guide type**:

- Curve;
- Linear;
- Pivot;
- Angle;
- Adaptive;
- Line map.



Important

Line maps are not created through the operation screen. They are only available on the list through guide importing. See topic [Import guide](#).

Line map

Guides of type **Shape file** actually correspond to a set of lines known as a **Line map**. On the on-board computer, the map can only appear through importing and can be externally created in three ways:

- It can be created in an office using a specific software;
- It can be created by exporting a guide from the on-board computer that the user exported in a **Line map** format. See topic [Export guide](#);
- It may be a guide created in an on-board device from a manufacturer other than Hexagon Agriculture. In this case, if there is incompatibility, the guide is imported as a **Line map**.

To learn how to import a **Line map** to the on-board computer, check topic [Import guide](#).

11.2.3.1 Save guide

Important This feature will only be available if the selected guide is temporary.

When a new guide is created, if the user had selected guide saving options **Never save** or **Always ask** and denied saving the guide, it will still be available in the **Wayline management** as a temporary guide and the user will have a chance to save it again.

Important While the active guide is not saved, it can be accessed as a temporary guide. However, in case a new guide of the same type is created, the previous temporary guide will be lost and replaced by the new one. The system allows one temporary guide of each guide type. To ensure you can access it again, save your temporary guide.

Warning When you try to save a guide with the same name as a previously saved one, you will be asked if you wish to overwrite it.

Important To configure the way of saving guides, visualize top [Managing guides](#).

Icon	Description
	Guide
	Guide management
	Save

To save a temporary guide to the system, proceed as follows:

1. On the operation screen, select the **Guide** option followed by **Wayline management**;
2. Select the temporary guide you wish to save from the list of guides;
3. Select option **Save**;
4. Edit the temporary guide's name;
5. Press **OK** to confirm.



Figure - Save guide

11.2.3.2 Import guide

In this option it is possible to import guides to display to use them at a later time.

Icon	Description
	Guide

	Guide management
	Import

To import guides through the **Guide manager**, proceed as follows:



Important

First insert the pendrive with the guide(s) you wish to import.

1. On the operation screen select the **Guide** option followed by **Guide management**;
2. Select option **Import**;
3. The system will show the pendrive files that can be imported;
4. Select the desired files and press **OK** to confirm;
5. Wait for the progress bar to finalize importing.



Figure - Import guide



Warning

Beware of the following restrictions when loading a line map:

- The display imports existing lines on your map, but does not create the parallel lines;
- Your map must contain at least 75 points to be imported.

The imported guides will show on the list of guides.



Important

In case the imported guide has the same name of a previously saved guide, a number will be added to the end of the file name. The previously saved guide will not be overwritten.

If the imported guide was created in a Hexagon Agriculture display, it can be imported as an **Original guide** or as a **Line map**, depending on how it was exported. See topic [Export guide](#).



Important

If the guide was created on an on-board device from a manufacturer other than **Hexagon Agriculture** and is **incompatible**, the guide(s) will always be imported as a **Line map**.

11.2.3.3 Export guide



Important

This feature will not be available if the selected guide is temporary.

This option allows exporting guides from the display to a pendrive.



Important

The export format is a shape file (.shp).

Guides can be exported in two ways:

Original guide

In this case, only the original guide is exported, without its parallels. In this format, the equipment recognizes the original guide and may import it again in the same format, then create the parallels.



Important

This option is not available for exporting a Line map, in which case it is impossible to know which is the original guide.

Line map

Exports the set of guides (original + parallels) according to the set number of guides to the left and to the right. Exporting creates a **Line map**, for which it is no longer possible to identify the original guide.

Icon	Description
	Guide
	Guide management
	Export

To export guides through the **Guide manager**, proceed as follows:



Important

First insert the pendrive for exporting the guide(s).

1. On the operation screen, select the **Guide** option followed by **Guide management**;
2. Select the guide you wish to export from the list of guides;
3. Select option **Export**;
4. Select the desired option: **Original guide (proprietary)** or **Parallel guides (generic)**;
5. If the **Original guide** option is selected, wait for the exporting on the next screen;
6. If the **Parallel guides** option is selected, specify the number of lines to the right or to the left and press **OK**;
7. Wait for the file transfer.



Figure - Export guide

11.2.3.4 Edit guide name



Important

This feature will not be available if the selected guide is temporary.

This option allows editing the name of a saved guide.

Icon	Description
	Guide
	Guide management
	Edit

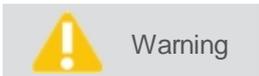
To edit a guide name through the **Guide manager**, proceed as follows:

1. On the operation screen, select the **Guide** option followed by **Guide management**;
2. Select the guide you wish to edit from the list of guides;
3. Select the **Edit** option;
4. Edit the name of the temporary guide;
5. Press **OK** to confirm.



Important

It is not possible to save a guide with the same name of a preexisting guide; the maximum number of characters is 32.



Warning

When editing a guide name with the same name as preexisting guide, you will be asked if you want to overwrite it.

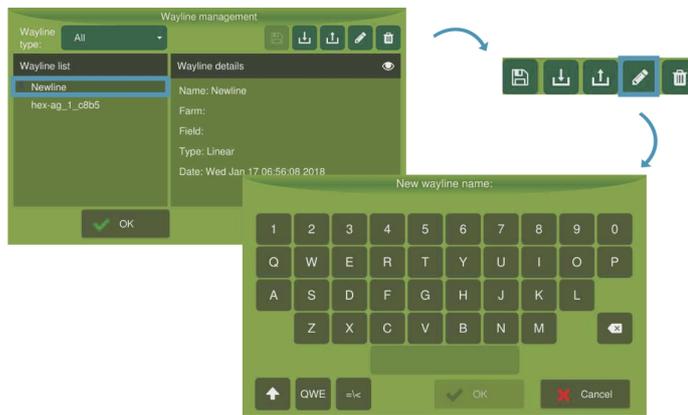


Figure - Edit guide name

11.2.3.5 Delete guide

Important This feature will not be available if the selected guide is temporary.

This option allows deleting a previously created guide.

Icon	Description
	Guide
	Guide management
	Delete

To edit a guide name through the **Guide manager**, proceed as follows:

1. On the operation screen, select the **Guide** option followed by **Guide management**;
2. Select the guide you wish to delete on the list of guides;
3. Select the **Delete** option;
4. Press **Yes** to confirm;
5. Wait for the operation to be confirmed.

Warning Be sure you want to delete the guide. It will be deleted from all the work sessions in the same field.

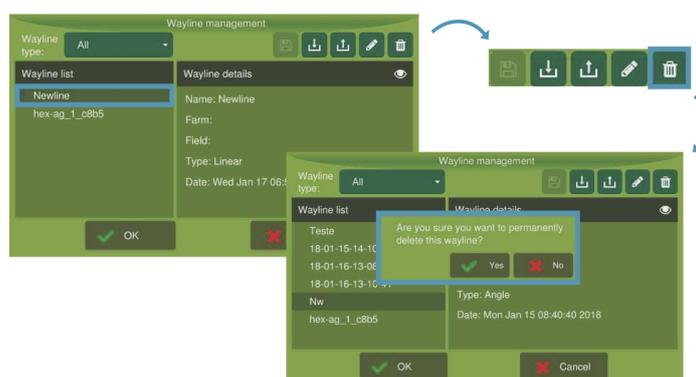


Figure - Delete guide

12. Files

The display allows data transfer from or to a pendrive. This is useful to import or export data from/to your on-board computer to/from other display units. The following options are available for transfer:

- **Operation maps**
Maps that contain information collected by the display such as seed sensors per line, GPS date and time, vehicle error relative to the guide, seed, fertilizer, and liquids application, application width, tractor speed, alarms, among others.
- **Prescription maps**
Maps with application recommendations.
- **Waylines**
Maps of operation lines in shape format with the purpose of using the same planned and standardized application trajectory.
- **Markers**
Marcadores criados para indicação de pedras, buracos, formigueiros, áreas molhadas entre outros.
- **Settings**
Settings to the display such as vehicle, implement, curve, GNSS, system, and interface settings.

Data transfer between the display and a pendrive is done in the **Configuration menu – Files**.

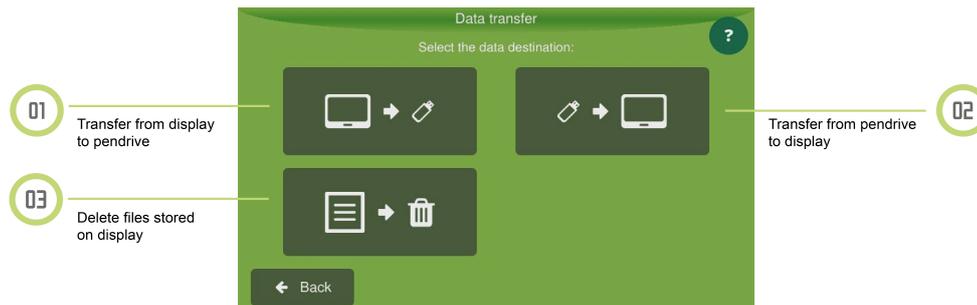


Figure - Data transfer

12.1 Exporting data

Insert a compatible pendrive into the USB port on the back of the display.



Warning

The display exports shape files in operations with covered area polygons.

12.1.1 Exporting an operation map

To export an application map, proceed as follows:

1. Select the **Files** option from the **Configuration menu**;
2. Select option **Export to USB**;
3. Select option **Operation map**;
4. Choose the items to be transferred.



Figure - Data transfer

5. Press **OK**;
6. Select the format to which you wish to export:
 - Display files (SAIG);
 - Google Earth kml files;
 - Shapefile (shp, dbf, prj e shx).

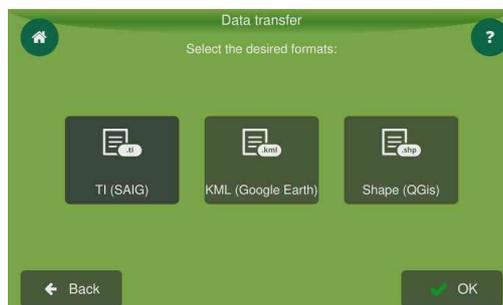


Figure - Data transfer - Formats

7. Press **OK**;
8. When the transfer is finished, press **OK**.

12.1.2 Exporting a prescription map

To export a recommendation map or line map, proceed as follows:

1. Select option **Files** from the **Configuration menu**;
2. Select option **Export to USB**;
3. Select option **Prescription map** or **Line map**;
4. Select the items you wish to export among those listed;
5. Press **OK**;
6. When the transfer is finished, press **OK**.

Warning It is possible to select more than one file to export.



Figure - Data transfer - Items

12.1.3 Exporting guides

To export a guide or a line map, proceed as follows:

1. Select option **Files** from the **Settings** menu;
2. Select option **Export to USB**;
3. Select option **Waylines**;
4. Select the desired option: **Original guide (proprietary)** or **Line map (generic)**;
5. If **Original guide** is selected, wait for exporting on the next screen;
6. If option **Parallel guides** is selected, delimit the number of lines to the right and to the left and press **OK**;
7. Wait for the file transfer.



Warning

It is possible to select more than one file to export.



Figure - Data transfer - Items



Warning

To learn more about the Original guide or Line map formats, see topic [Export guide](#).

12.1.4 Exporting markers

To export markers, proceed as follows:

1. Select option **Files** from the **Configuration** menu;
2. Select option **Export to USB**;
3. Select option **Markers**;
4. Select the markers you wish to export among those listed;
5. Press **OK**;
6. When the transfer is finished, press **OK**.



Warning

You can select more than one file for export.



Figure - Exporting markers

12.1.5 Settings

To export settings, proceed as follows:

1. Select **Files** from the **Configuration menu**;
2. Select option **Export to USB**;
3. Select option **Settings**;
4. Select the settings you wish to export among those listed;
5. Press **OK**;
6. When the transfer is finished, press **OK**.



Warning

It is possible to select more than one file to export.



Figure – Exporting settings

12.1.6 Exporting pending files



Warning

This field will only be enabled when the **Send files to cloud automatically** option is automatically selected.

To export pending files, proceed as follows:

1. Select **Files** from the **Configuration menu**;
2. Select option **Export to USB**;
3. Select option **Exporting files**;
4. Select the settings you wish to export among those listed;
5. Press **OK**;
6. When the transfer is finished, press **OK**.



Warning

It is possible to select more than one file to export.

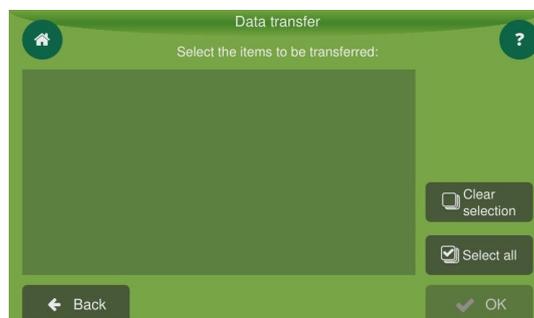


Figure - Pending files list

12.2 Importing data

To import data, proceed as follows:

1. Insert a compatible pendrive into the USB port on the back of the display;
2. Select option **Files** from the **Configuration menu**;

3. Select option **Import from USB**;
4. Select the type of data you wish to import:
 - Operation map;
 - Prescription map;
 - Guides;
 - Markers;
 - Settings.
5. Select the desired option and press **OK**;
6. When the transfer is finished, press **OK**.



Warning

To learn more about importing guides, see topic [Import guide](#).



Important

To import a perimeter, select the **Prescription map** option.

12.3 Deleting data

To delete data stored in the display, proceed as follows:

1. Select option **Files** from the **Configuration menu**;
2. Select option **Delete data**;
3. Select option **Operation map** or **Prescription map**;
4. Select the items you wish to delete among those listed;
5. Press **OK**;
6. When the transfer is finished, press **OK**.

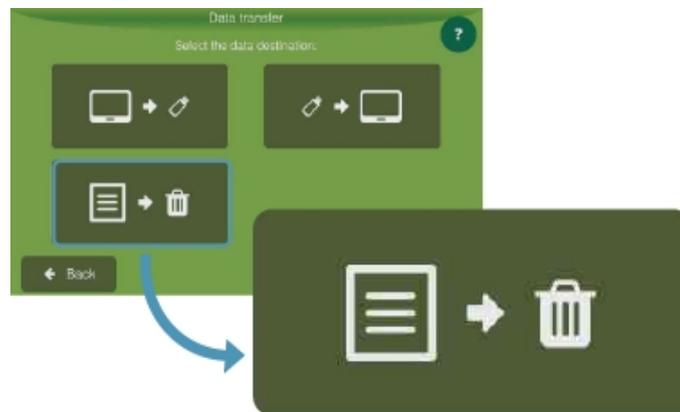


Figure - Delete data

13. System settings

The general system settings are available in **Configuration menu - Settings**.



Figure - System settings

13.1 Modo normal

13.1.1 About

Shows the software version for the display, the processor (CPU) and screen (LCD) temperatures, the serial number, as well as shows information on the GNSS data, among others.

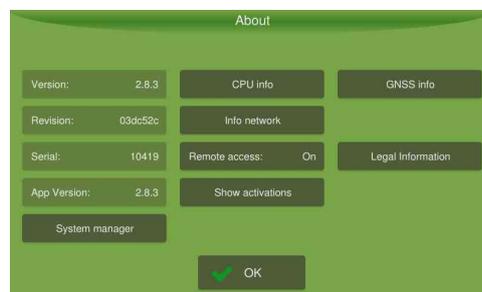


Figure - About

13.1.1.1 Version

Information about the system is composed of the following item set:

- Version;
- Revision;
- Serial number;
- Application version.

13.1.1.2 System manager

To access the system manager, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Select option **About**;
3. Press the **System manager** button.



Update

Installing software update

i Important To update the system manually it is possible to download the file to the pendrive through the website of Hexagon Agriculture, in the part of **Support**.

In **Software update** the updates that have been automatically downloaded by the system and/or updates available through a pendrive are shown.

To perform the software update, proceed as follows:

1. Select **Update** on the **System manager** screen;
2. Select **Installing software update**;
3. Select the update you wish to install and select **Yes**;
4. The progress bar will be displayed;
5. Wait for the installation until the progress bar is complete.

Uninstalling software update

In **Uninstall software update** it is possible to uninstall the latest installed version.

Installing config update

In **Install config update** it is possible to install system settings.

i Important This option is only available for displays in monitoring mode.

Uninstalling config update

In **Uninstalling config update** it is possible to uninstall the latest installed settings.

Backup

It is possible to create data and settings backup from your display, restore backed-up settings, and delete backups. Furthermore, you can import or export a backup, thus passing information from one display to another.



Figure - Backup

Creating a backup

1. Select option **Create backup** to create a backup of the current display settings;
2. Confirm the operation by selecting **Yes**;
3. Wait for the process to finish and press **OK**.

Restoring a backup

1. Select option **Restore backup** to restore a backup;
2. Select the desired backup from the list;
3. Confirm the operation by selecting **Yes**;
4. Wait for the process to finish and press **OK**.

Removing a backup

1. Select option **Remove backup** to delete a backup;
2. Select the backup you wish to delete from the list. It is possible to select more than one backup;
3. Select option **Remove** in the upper right corner;
4. Wait for the process to finish and press **OK**.

Exporting a backup

1. Select option **Export backup** to export a backup to a pendrive;
2. Insert the pendrive into the display USB port;
3. Select the backup you wish to export from the list. It is possible to select more than one backup;
4. Select option **Export** in the upper right corner;
5. Wait for the process to finish and press **OK**.

Importing a backup

1. Select option **Import backup** to import a backup from a pendrive to the display;
2. Insert the pendrive into the display USB port;
3. Select the backup you wish to import. It is possible to select more than one backup;
4. Select option **Import** in the upper right corner;
5. Wait for the process to finish and press **OK**.

Collecting diagnostic information

When an error occurs and the display can no longer operate, the recovery mode will show on your screen. The diagnostic information obtained from the display must be sent to **Hexagon Agriculture** s technical support when requested. To collect the data, proceed as follows:

1. Insert a pendrive into the display USB port;
2. Select option **Collect diagnostics**;
3. Confirm the operation.

Factory reset

Factory reset may solve problems and system crashes. With this procedure, the display settings and all adjustments will return to the factory default values. Before performing a factory restore, however, it is important to collect diagnostic information for **Hexagon Agriculture** s technical support evaluation.

About this system

Press this option to obtain version and revision information for the system manager and the operating system version. This information is useful for technical support.

Power off

Press this option to shut the display off. It is not possible to exit the system manager without pressing the **Power off** option.

13.1.1.3 CPU information

Indicates CPU temperature.



Figure - CPU temperature

13.1.1.4 Network information

This screen indicates the state of the device's network: **offline** or **online**. When the device is **online**, the following information is also presented:

- Ethernet interface;
- MAC address;
- IP address.

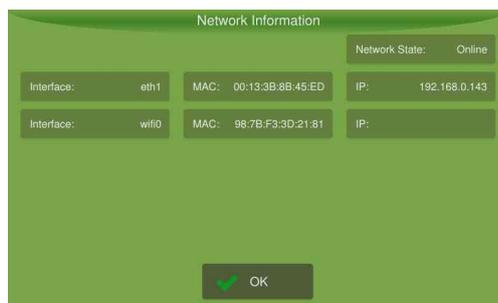


Figure - Network state

13.1.1.5 Remote access

Here it is possible to turn remote access on or off. When off, the display will not be viewed nor operated remotely.



Important

See further information on remote access in this manual's specific topic [Support mode](#).

13.1.1.6 Show activations

Shows the list of features that are activated on the display.



Figure - List of activations

13.1.1.7 GNSS information

Shows a list of information regarding the GNSS.

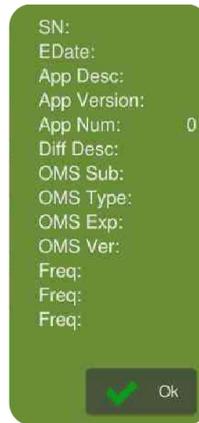


Figure - GNSS information

13.1.1.8 Legal information

Shows information on use licenses.

13.1.2 Language and region

In this option it is possible to select the visualization **Language**, to set the **Time zone**, and to select the color **Theme** for the display.



Figure - Language and region

- **Language**
Select the desired language and confirm.
- **Time zone**
Press + and - to inform the local time. Each touch will alter time in 15 minutes from the UTC (Coordinated Universal Time).
- **Theme**
Select the default or night theme for the operation screen and confirm.

13.1.3 System mode

This option allows alternating between **Normal** and **Advanced** mode. This operation may only be performed by entering a password.

To alter the **System mode**, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Select option **System mode**;
3. Enter the password and press **OK**.

Normal mode

In this mode, the user only has access to basic features of the on-board computer. Used mainly by operators.

The following features are enabled in normal mode:

- About;

- Language and region;
- Support;
- External settings;
- System mode;
- Network troubleshooting.

Advanced mode

In this mode, other than the basic features in normal mode, the user has access to advanced features of the on-board computer. Used mainly by technicians.

The following features are enabled in advanced mode:

- Change password;
- Logging;
- Network;
- Activation;
- Firmware update;
- Access to the GNSS option in the Settings menu;
- Data synchronization;
- PLC;
- Add, edit, and remove vehicle;
- Add, edit, and remove implement.

13.1.4 Support mode

This option gives specialized technicians access to installation settings and advanced tests. This operation can only be performed entering a password.

To access the assistance options, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Select option **Support**;
3. Enter the password and press **OK**.

The following features are enabled when **Support** is selected:

- Advanced file transfer;
- Implement motor test;
- **Firmware test** and **Firmware transfer**;
- Enable/disable **Monitoring mode**;
- Enable/disable **Navigation mode** with routes.

13.1.5 Network troubleshooting

Informs on the situations of the connections of the drivers connected to the CAN network and the display.

Commands	Description
OK	All function drivers are connected.
NC,X	Function driver number X is not on the network.
EX,X	Driver X is spare on the network.
Conflict	Two drivers with the same address.
Not installed	Implement does not require this type of driver.

The drivers that may be connected to the display are:

- Controller;
- Deep;
- Sprayer;
- Gate;
- Auto steering;
- Planting monitor;
- Transport;
- Machine monitor;
- Cutting section;
- Logic controller
- Ant killer controller.

- **Reset**

Clears the address for all the devices connected to the CAN.

- **Device info**

Shows the software version and the external power supply for the connected devices.

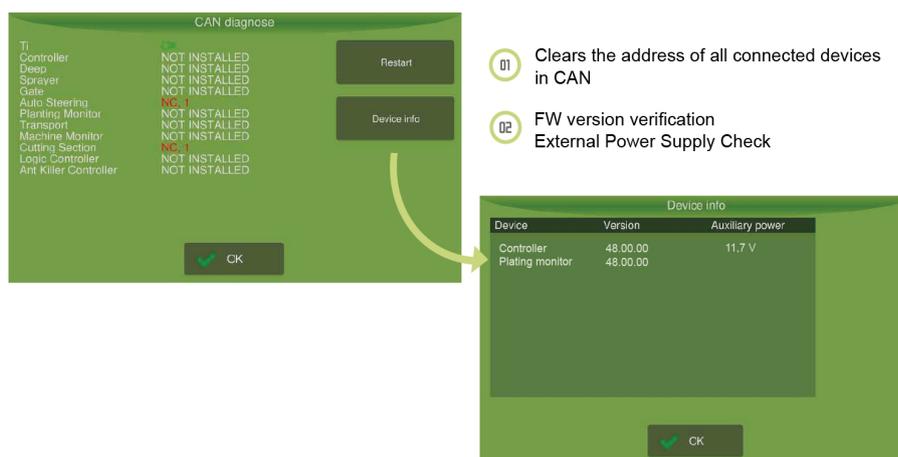


Figure - Network troubleshooting

13.2 Advanced mode



Figure - Advanced mode

13.2.1 Change password



Important

Feature only available in **Advanced** mode.

This feature allows changing the password for accessing the **Advanced** mode. To change the password, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Go to **Advanced mode**;
3. Select option **Change password**;
4. Enter the new password and confirm pressing **OK**.

13.2.2 Logging



Important

Feature only available in **Advanced** mode.

This feature allows the user to choose how the log file for the events that occurred during the operation is stored. To select how the log file is stored, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Go to **Advanced mode**;
3. Select option **Logging**.

The file may be stored in the following ways:

- **Single file**
This way the log is saved in a single application file separated by work session and by implement type.
- **Daily**
This way the application file is created for each day of operation.
- **Periodic**
This way the user must choose a desired period among the options, namely 12 hours, 1 hour, 30 minutes, or 15 minutes.

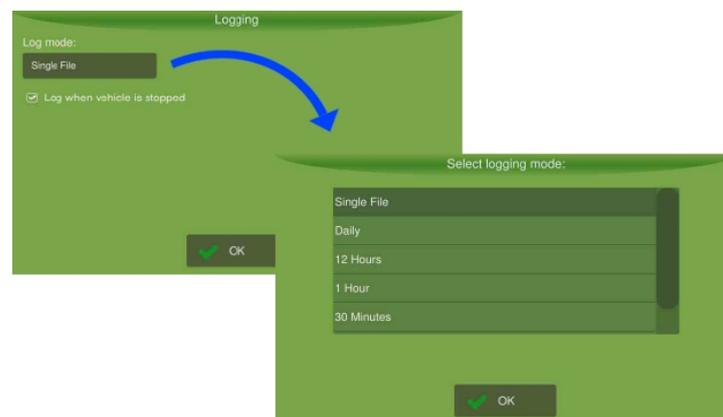


Figure - Storing the log

The following options are also available for the user to choose:

- Log in even when the vehicle is stationary
- Log in even if you lose the GNSS signal

When selecting any form of storage other than the daily type, the following options are presented:

- Send files to the cloud automatically, in this case indicate the start date of the files you want to send.
- Automatically delete old files, in this case inform the files with how many days you want to delete.



Figure - Freeing memory

13.2.3 Network

i Important Feature available only for the Advanced mode.

To enable your display for the Mobile data and Wi-Fi, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Go to **Advanced mode**;
3. Press **Network**;
4. Select the desired network.



Figure - Network

- For mobile network settings, see the topic [Mobile connection](#).
- For Wi-Fi settings, see the [settings Wi-Fi](#) topic.

13.2.3.1 Mobile data settings

By pressing the **Mobile data** button, the connection screen is displayed.

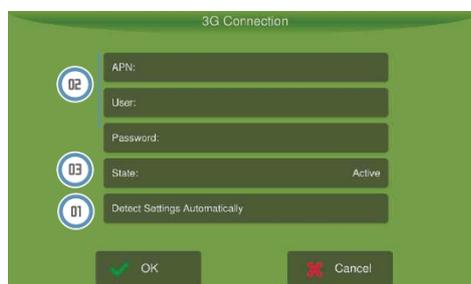


Figure - Mobile data

To configure the connection, proceed as follows:

1. Press the **Detect settings automatically** option so that the data indicated as number 02 in the figure above be automatically filled in. This option may not be available for all 3G SIM card models;
2. If the data were not detected automatically in the previous step, manually fill them with the information supplied by the mobile network service provider;
3. Set the network state as **active** to enable it.

On the upper bar of the operation screen, the Mobile network icon will become available and may present two states: **Active** and **Inactive**.

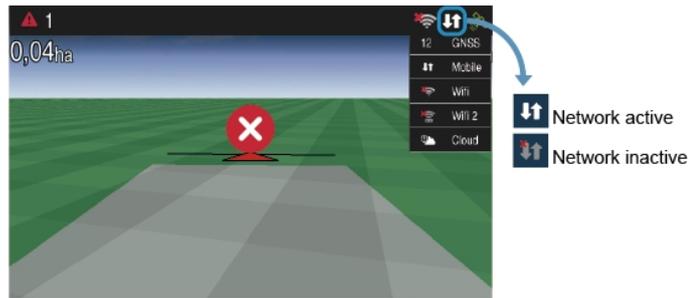


Figure - Mobile on the operation screen

13.2.3.2 Wi-Fi network settings



Important

Some displays have two Wi-Fi connections: internal and external Wi-Fi. The internal Wi-Fi may be requested when the display is purchased, while the external Wi-Fi may be acquired at a later time. In this case, the Wi-Fi USB adapter must be approved.

By pressing the **Wi-Fi** button, the connection screen is displayed.



Figure - Wi-Fi network

To configure the network, proceed as follows:

1. Select the Wi-Fi network;
2. Press **OK**.



Important

In case your Wi-Fi network is not listed, the Wi-Fi network access point can be manually enabled through button Enable access point. Enter the name of the network (SSID) and the password on the next screen.

On the upper bar of the operation screen, the Wi-Fi network icon will become available.

13.2.4 Activation



Important

Feature available only in the **Advanced mode**.

This feature allows new implements to be activated.

To perform the activation, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Go to **Advanced mode**;
3. Select option **Activation**.

13.2.4.1 Pendrive procedure

To activate a feature using a pendrive, proceed as follows:

1. Insert the pendrive with file "ActivationCode.sig";
2. Press **Import**;
3. Press **Activate**;
4. Check the success or failure message.

13.2.4.2 Manual procedure

To manually activate a feature, proceed as follows:

1. Fill in the **H0** through **H7** and **Fix** fields;
2. Press **Import**;;
3. Press **Activate**;
4. Check the success or the failure message.

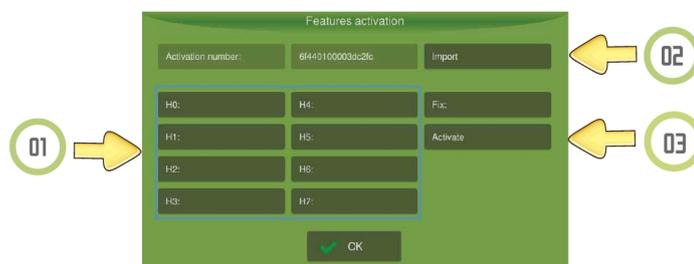


Figure - Activation

13.2.5 Firmware update



Important

Feature available only in the **Advanced mode**.

This feature allows the user to update the driver firmware.

To update the firmware, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Go to **Advanced mode**;
3. Select option **Firmware update**;
4. Select the desired device connected to the CAN network and press **Advance**;
5. On the following screen all the firmware valid for the selected driver will be listed;
6. Select the desired firmware and press **OK**.



13.2.6 External settings

On the external settings screen, it is possible to set the horn and the operation switches.



Figure - External settings - displays Ti10

- **Internal buzzer**

Turns the sound alarm on and off. If it is On, some alarms will be notified with beeps. If it is Off, the horn will never beep.

- **M sensor mode**

This is used to select if the Ti s external switch should be used to control the pilot or to control the operation. If the **Operation** option is selected, the **Operation switch** button is disabled. If the **Auto steering** option is selected, the **Operation switch** is disabled.



Important

The display Ti10 always keeps the pilot and operation switches enabled.

- **Auto steering switch**

The pilot switch is used to turn the automatic pilot on/off. It has the same states as the operation switch.

- **Operation switch**

The operation switch is used to start/stop the operation. Select the **Momentary** option if your button is the kind that returns to the normal state after being pressed, and select option **Maintained** if your switch is the kind that maintains its state after being pressed.



Important

When buttons of type **Maintained** are used and the state of the button indicates that the operation is stopped or the automatic pilot is off, it will not be possible to turn them on through the screen. The button needs to be indicating the on state. The same occurs for **Momentary** buttons, because in this case the operator can always turn the operation or the pilot on/off either with the button or on the screen.

- **Operation signalizer**

This option may be used when an output is required to connect with third-party equipment. When on, the output of the right external horn stops being a horn and starts to indicate the application status, i.e., twelve volts will be applied to the output if it is marking the trail, and zero volts when it is not marking the trail.



Warning

During device initialization, 12V pulses of short duration (less than 250ms) may be applied to this output.

- **Flag sensors A and B**

This option enables two inputs to the device to mark indicators such as pits.



Important

The flag sensor buttons are available for the display T10.

- **Primary CAN**
This option you can select **Isobus** or **HxAg**.

13.2.7 Data synchronization



Important

Feature available only in the **Advanced** mode.

On the data syncing screen it is possible to configure automatic software updates. The automatic update is only possible if the display is connected to the Internet.

To configure data syncing, proceed as follows:

1. Select option **Settings** from the **Configuration menu**;
2. Go to **Advanced mode**;
3. Select option **Data synchronization**;
4. Enter the hostname. This field is factory filled with the default hostname.



Important

This server is also used for the Routes feature.

5. Select option **On** so that the update is ready for installation through the system manager. In the **Off** state it is not possible to update the software because there is no communication with the server;
6. In the **Period** (minutes) option, select the time interval in which the display will check for new updates.



Important

In the **Software version** and **Config version** options, it is possible to check the last updated version.



Figure - Data synchronization

On the right side the following options are available:

- **Show update alert**
Asks the user if he wishes to download the new update.
- **Download over mobile network**
Select this field if you want the Ti to use the mobile network if it is unable to connect to the Wi-Fi network for the download.
- **Install automatically**
The display automatically installs the software updates without asking the user for permission on the device boot following the update download.

13.2.8 RFIDs tags list



Important

Feature available only in the **Advanced** mode.

On this screen it is possible to see the RFID tags read by the equipment.

To access the list, proceed as follows:

1. Select the **Settings** option in the **Configuration menu**;
2. Enter **Advanced mode**;
3. Select the **RFID tag list** option;
4. The system lists the RFID tags visible to the equipment.



Important

The visible RFID tags are automatically displayed in the list, the update time is configurable. The range depends on the type of antenna used, power of the signal and the presence or absence of obstacles on the way, but it is usually in the range between +/- 2 meters.



Figure - List of RFID tags

Icon	Description
	Update RFID tag list
	View RFID reader configuration
	Stop the tag search service

The following options are available:

- **Search for connected tags**
When selecting this item, the system clears the list of tags that already existed and forces a new search for available devices.
- **View RFID reader settings**
The RFID reader information is displayed.
- **Stop the update service**
When the service is stopped, all tags already listed are deleted.



Figure - View reader configuration

When clicking on an item in the list, the user is taken to the tag information screen, where he can define a new trailer, see the [topic tag information](#) for more details.

13.2.8.1 Information tag

The configurations of the tag selected in the list are presented. On this screen it is also possible to define a new trailer for tag allocation.

To change the trailer linked to the tag, proceed as follows:

1. Select the **Settings** option in the **Configuration menu**;
2. Enter **Advanced mode**;
3. Select the **RFIDs tag list** option;
4. Click on the tag you want to change;
5. The tag information screen is displayed;
6. Select the option to reset the trailer (icon);
7. Enter the trailer identifier on the keyboard;
8. Confirm the operation in the message;
9. The system updates the tag with the information provided.



Important

When a new trailer is written to the tag, all of its content is deleted, so that new content can be later recorded and associated with that new trailer



Figure - Define trailer



Important

If it is not possible to update the tag, an error notification is displayed.

13.2.9 PLC



Important

Feature available only in the **Advanced** mode. e mediante ativação específica.



Figure - PLC settings

To access the list, proceed as follows:

1. Select the **Settings** option in the **Configuration menu**;
2. Enter **Advanced mode**;
3. Select the **PLC** option;
4. Select the **Trailer** or **Truck** option according to the vehicle.



Figure - PLC selection

Truck

If you selected the **Truck** option, you can update the firmware, according to the topic [firmware update](#).



Warning

If the Truck device is not available, or working correctly, a message will be displayed when selecting this option.

Trailer

If you selected the **Trailer** option, the list of devices connected via PLC will be displayed.

Serial nº	Id	Sinc.	Sucesso	Erro	Perdidos	Con.
		0.00%	0.00%	0.00%	0.00%	
114477	261		90.00%	0.00%	5.00%	✓
765432	261		90.00%	0.00%	0.00%	✓

Figure - Trailers devices



Warning

Os dispositivos que possuem versão de firmware anterior a versão 2.2.0, serão apresentados na lista para poderem ter seus firmware atualizados, mas não serão considerados como dispositivos ativos para utilização pelas funcionalidades de software, como por exemplo, no RMT (Raw Material Traceability).

O estado da conexão pode ser:

- **Sinal de Alerta**

Significa que a sincronização foi estabelecida e que o firmware está desatualizado, neste caso é preciso atualizá-lo ou não conseguirá acessar suas configurações.

Para atualizar o firmware, proceda da seguinte forma:

1. Selecione o dispositivo que deseja atualizar, para isso, clique sobre o número de série;
2. Selecione a opção **Firmware** que foi habilitada na parte superior;
3. O sistema apresenta a tela para atualização do firmware, siga para o tópico [Atualização do firmware](#).



Warning

Este mesmo processo de atualização deverá ser feito nos **DOIS** dispositivos da lista que pertencem ao mesmo conjunto, no caso da atualização para o **Reboque**.

- **Sinal de Check**

Indica que a sincronização foi estabelecida e que o firmware está atualizado, caso deseje ter acesso as configurações:

1. Selecione o dispositivo que deseja configurar para isso, clique sobre o número de série;
2. Selecione a opção **Configurações** que foi habilitada na parte superior;
3. O sistema apresenta a tela para configuração do dispositivo, siga para o tópico [Atualização das configurações](#).

13.2.9.1 Firmware update

The firmware update of the devices can occur for both the **Trailer** and the **Truck**.



Figure - Firmware update

To update the firmware, proceed as follows:

1. On the screen presented, select update via **OTA** or **PLC**;
2. The system display the update progress bar;
3. At the end of the update, a success message will be displayed.



Important

A message will be displayed in case the firmware is already updated, or if the update fails.

Update via PLC

Selecting this option, the system will send the firmware to the device via the PLC cable. To ensure the quality of the update, a more robust cable is required.

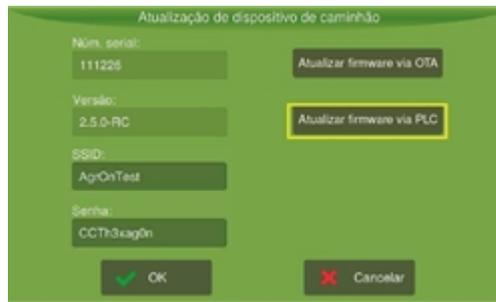


Figure - Update via PLC

Update via OTA

By selecting this option, the system will attempt to connect to the Wi-Fi network configured to send the firmware to the device.



Important

It will not be necessary a robust PLC cable in this type of update, as it will only be used to communicate to the device the data of the network that will be used for update.



Figure - Update via OTA



Warning

This same update process must be carried out on the **TWO** devices on the list that belong to the same set, in the case of upgrading to the **Trailer**.

13.2.9.2 Device config



Important

This procedure is only available for the trailer vehicle.

To configure a device, proceed as follows:

1. In the list of devices, select the one you want to configure by clicking on the serial number.



Important

It is not possible to configure devices with outdated firmware, in this case update the firmware according to the topic [firmware update](#).

2. Select the **Settings** option in the right corner of the screen;
3. The configuration data for the selected device is displayed;



Important

To check the network the device is using for communication, see the topic [firmware update](#).

4. Change the settings if you wish and select **OK** to confirm;



Figure - Device config

The following options are available:

- **Trailer Id**
Enter the trailer identification code.
- **Trailer length in meters**
Enter the size of the trailer in meters.
- **Trailer position**
Number corresponding to the order of the trailer in the connection sequence, the trailer in position 1 corresponds to the one closest to the truck cabin.
- **Accelerometer sensitivity**
It is the sensitivity of the device to return to operation when without power. The lower the value, the more sensitive, that is, with lower vibrations, the device will wake up and start operating again.

14. Assistance and remote access

To request remote assistance contact our technical assistance service. The technician will contact you to remotely operate your display. The technician can press buttons in your stead to perform the required actions or guide you to solve your problem.



Warning

The display is factory set with the remote access option enabled. If you wish for this option not to be available to Hexagon Agriculture, go to **Configuration menu – System settings – About – Remote access** and select **Off**.

The technician can give support in two ways:

- **Visualization mode**

In this mode the technician guides the display operator to perform the assistance steps. The technician views your display screen, but cannot alter any data. Any click the technician makes is ignored and will not be sent to your device. Only the display user can operate the system.

- **Operation mode**

In this mode the technician gives assistance by operating your display. In order for the technician to operate, a message will be sent through the display requesting operation access.



Important

The technician must have the display s serial number and it must be connected to a network to use remote assistance. Technical support access is done via Hexagon Agriculture s web support software.

14.1 Visualization mode

To have remote access in **Visualization mode**, the technician needs to have the device s serial number and access it through the web software that Hexagon Agriculture used to provide remote assistance. It is possible to identify that the Ti on-board computer is being visualized remotely by a technician through the visualization indicator icon on the bottom right corner of the screen.

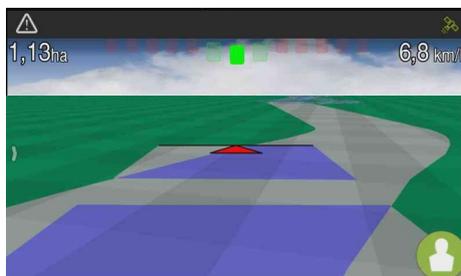


Figure - Visualization mode icon



Warning

The display is factory set with the remote access option enabled. If you wish for this option not to be available to Hexagon Agriculture, go to **Configuration menu – System settings – About – Remote access** and select **Off**.

If the remote access option is off, when a technician tries to visualize the device remotely, a message will be displayed on the display screen for the user to alter the remote access settings if he wants to allow visualization.

14.2 Operation mode

To allow remote access in **Operation mode**, proceed as follows:

1. The technician requests remote access authorization through a message on your display screen. The message informs the name and company of the user making the request;
2. Confirm the operation selecting **Yes** to authorized access;
3. Check if an operation icon such as the one on the figure is displayed in the bottom right corner of your operation screen.

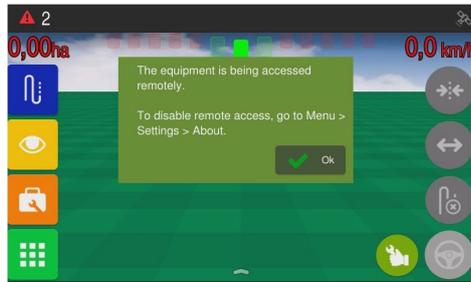


Figure - Operation mode icon



Important

Remote access may be interrupted at any time by pressing the access icon on the bottom right corner of the screen. The display will display a message for the user to confirm access interruption.

15. Technical features

15.1 Display Ti10

Monitor data

- Material: 10,1 LCD, 1280X800 pixel, 16,7M colors with touch interface;
- Processing: Quad Core 1.2 GHz, 2 GB RAM;
- Storage: 32 GB FLASH;
- Dimensions: 250 (W) X 177 (L) X 47 (H) mm;
- Weight: 2600g;
- Power supply voltage: 12VDC;

Environmental specification

- Operating temperature: -20 to +70 [°C];
- Storage temperature: -30 to +80 [°C];
- Humidity: 95% maximum.

Interfaces

- CAN: 3 x Back;
- USB: 1 x Back;
- RS-232: 2 x Back.

Models according to the GNSS module*

Model		Ti10
GNSS module		Novatel OEM7500
Settings	Channels	181 L1, L2, L5, B1, B2, E5b, AltBOC
	Constellations	GPS, GLONASS, BeiDou, Galileo, NavIC, QZSS, SBAS, L-Band
Horizontal position precision	Simple point	L1 only / 1,5m L1 / L2 / 1,2 m
	SBAS	0.60 m
	DGPS	0.40 m
	PPP	TerraStar-L / 0,40 m TerraStar-C / 0,04 m
	RTK	0.01 m + 1 ppm
Startup time	Start in heat	35 s
	Start in cold	50 s
Data rate	Measurements	20 Hz
	Position	20 Hz
Temporal accuracy		20 ns
Speed accuracy		0,055 m/s

*Data taken from the manufacturers websites: <https://www.u-blox.com> and <https://www.novatel.com>.

Wi-Fi* and Bluetooth module

Technology	Technical features
Wi-Fi	<ul style="list-style-type: none"> IEEE802.11a/b/g/r
Bluetooth	<ul style="list-style-type: none"> 5.0BR/EDR/LE

Mobile network

Technology	Bands
LTE	<ul style="list-style-type: none"> Band 1 (2100 MHz) Band 3 (1800 MHz) Band 5 (850MHz) Band 7 (2600 MHz) Band 8 (900 MHz) Band 28 (700MHz)
HSPA+, UTMS	<ul style="list-style-type: none"> Band 1 (2100 MHz) Band 5 (850 MHz) Band 8 (900 MHz)
EDGE, GSM, GPRS	<ul style="list-style-type: none"> EGSM 900 (900 MHz) DCS 1800 (1800 MHz)

Certifications

This device has no right to be protected against harmful interference and cannot cause interference with duly authorized systems.

16. FCC statement (applicable only in the USA)

Tests performed on the display have shown its compatibility with the limits for Class A digital devices, to the terms of Part 15 of the FCC rules. These limits are designed to offer reasonable protection against any harmful interference when the device is operated in a commercial environment.

This device generates, uses, and may radiate radiofrequency energy if it is not installed in accordance with the instruction manual supplied by the manufacturer, and may cause harmful interference to radio communications.

Operating this device in a residential area may cause harmful interference, in which case the user must correct the interference at his own expense.



Warning

Functional alterations or modifications not expressly approved by Hexagon Agriculture may void the user's authority to use the display.

17. Compliance with European Directive 1999/5/EC (R&TTE)

By means of this term, **Hexagon Agriculture** declared that the display meets the basic requirements and other important provisions of Directive 1999/5/EC. The compliance declaration can be found at <http://www.hexagonagriculture.com>.



Class 1 device in accordance with European Directive 1999/5/EC (R&TTE). Can be marketed and put into operation without restriction in a Member State of the European Union.



Warning

Relative compliance to countries whose regulations are not covered by European Directive 1999/5/EC must be approved before use and operation.

Type	Frequency band [MHz]
GNSS Receptor	L1: 1368 +/- 43 MHz L2: 1236+/-18 MHz
CDMA	800/1900 MHz
HSDPA	850/900/1800/1900/2100 MHz

Output power:

CDMA +24 dBm
HSDPA +24 dBm

Type	Antenna	Gain	Connector	Frequency band
GNSS receptor	Pinwheel OEM	22 dBi	TNC JACK	L1: 1568.0 ± 43.0 MHz L2: 1236.0 ± 18.3 MHz L5, E5a: 1176.0 ± 12.0 MHz E5b: 1207.0 ± 12.0 MHz B2: 1191.8 ± 25.0 MHz
Cell phone	TEOGLAS	2,6 dBi	SMAJACK	824 - 960 1710 - 2170

18. Problems and solutions

Problem	Solution
Display will not turn on	<ul style="list-style-type: none"> Check the power supply; Check the fuse; Check if the connections are secure; Check if the cable is not broken (use a multimeter to test the voltage).
GNSS problem	<ul style="list-style-type: none"> Check if the GNSS is in an area with sky-bound view. In covered areas, the signal will become too low and may not locate properly; Check the antenna cabling; Measure the GNSS cable voltage (5v); Check if the GNSS Port and Model are correctly selected on the GNSS menu.
Motor will not move	<ul style="list-style-type: none"> Perform display tests and calibrations; Check if the hose connections are correct (pressure and tank); Check if the command is in the right direction; Check if the operation is not stopped in the display; Check if the encoder is blinking when it turns; Check if the vehicle is not below the operation speed range.
Map problems	<ul style="list-style-type: none"> Within the pendrive, the SHP, SHX, and DBF files must be in the same location; The map name cannot contain special characters or spaces; The map name might be too long.
Sprayer problems	<ul style="list-style-type: none"> Perform calibration and simulation; Check the filter; Check the valve and flow meter cabling; Check if the vehicle is below the operation speed range.
Application failure when entering and exiting borders	<ul style="list-style-type: none"> Check if the antenna-pin and pin-implementation distances are correct.
Nothing happens after starting the installation test for the pilot sensor	<ul style="list-style-type: none"> Check if the automatic pilot driver is recognized on the network (Settings menu – Network diagnosis). In case it is not found, check the power supply and cable continuity; Check the sensor's power cable for continuity and check that the voltage between pins "3" and "1" is of 12v.
Nothing happens after starting the HV control test	<ul style="list-style-type: none"> Check if the automatic pilot driver is recognized on the network (Configuration menu – Network diagnosis). In case it is not found, check the power supply and cable continuity; Check the wheel sensor and hydraulic valve cables; Check the hydraulic system (if there are no inverted connections, etc).
The wheel turned to the opposite side	<ul style="list-style-type: none"> Invert the connectors on the valve terminals. If the problem persists, check the instructions on the hydraulic pilot topic Sensor installation.
Pilot problems	<ul style="list-style-type: none"> Check the tank oil level; Check for possible leaks; Check the pilot driver's attachment; Check the steering sensor.

19. Glossary

CAN – The Controller Area Network is an internal communication network that intercommunicates components within the vehicle. It must ensure message delivery, the absence of message conflicts, minimum delivery times, low cost, and ability to operate reliably in an environment with electrical noise.

BEC – Sugarcane electronic newsletter.

DIFF – Method of correcting the GNSS positioning. Without it, the automatic pilot cannot operate properly.

GNSS – Name of the global positioning system. It is a satellite navigation system that provides a mobile receiving device its own position.

Latitude – Latitude is the angle between the equatorial plane and the reference surface. Latitude is measured in degrees North and South of the equatorial plane, between 90° South at the South Pole 90° North at the North Pole.

Longitude – Longitude is measure along the equatorial plane and represents the distance between a point and the Greenwich Meridian. It is measured in degrees, from 0° to 180° East or West.

Kg/ha – Kilograms per hectare.

L/min – Liters per minute.

Pl/ha – Plants per hectare.

PPL – Pulses per liter.

PPS – Pulses per second.

Pulse – Electrical information provided by the flow meter or encoder.

Relation – For inputs, this is the relation between the applied weight over the hydraulic motor s RPM. For sprayer, it is the number of pulses of the flow meter over liters.

RPM – Rotations per minute provided by the hydraulic motor s sensor.

Section – Set of nozzles for the sprayer bar or of planting/fertilizing lines that may be opened or closed simultaneously.

20. Warranty certificate

Product description

Hexagon Agriculture display precision farming system.

About the Warranty

1. Hexagon Agriculture guarantees the proper functioning of the product(s) indicated above and that it markets, and commits, for a twelve-month period* as of the date of issuance of the respective invoice, comprised of the three months of legal warranty and nine months of contractual warranty, to repair and replace the parts and materials that present verified manufacturing defects under normal use conditions and for the purposes for which they are intended, taking responsibility for the cost of the part(s) to be replaced, as well as for the required manpower, although the purchaser shall bear the technician travel costs and/or the costs for shipping the part(s) for repair.

*Except for whips, sensors, and connectors, for which the warranty period is of three months.

1.1. The manufacturer must be immediately notified of any defect found on the product. Such notification must be formalized via electronic correspondence through addresses comercial@hexagonagriculture.com and suporte@hexagonagriculture.com.

1.2. This warranty certificate will only be valid for products marketed and used in Brazil, and must be presented along with the respective Invoice, which will integrate it for all purposes.

Warranty exclusions

2. Hexagon Agriculture's liability will be void when:

- a) The product's serial number or identification label are removed/altered;
- b) The product seal is removed;
- c) The product is connected to a voltage other than that specified in the installation/operation manual;
- d) The product is placed in an improper location, in disagreement with the rules set forth in the installation/operation manual;
- e) The product is used in disagreement with the rules set forth in the installation/operation manual, or for purposes other than that for which it is intended; and/or
- f) The product has suffered any type of accident, provided such accident was not due to the defect.

Warranty limitations

3. The warranty hereby granted shall not extend to damages and/or malfunction of the above identified product(s) when the following hypotheses are verified:

- a) Use and/or operation in disagreement with the operation manual;
- b) Risks, cracks, dents, deformations, and/or any other types of damages resulting from accidents during transportation or handling;
- c) Failure to observe the cleaning and lubrication instructions in the instructions manual, including the use of materials and chemical products not recommended by Hexagon Agriculture;
- d) Not sending the signed installation form to Hexagon Agriculture;
- e) Operation with parts and materials of dubious origin or of low quality;
- f) Modifications, repairs, assemblies/disassemblies, installations/uninstalling carried out by persons or technicians not accredited by Hexagon Agriculture;
- g) Malfunctions or failures due to power supply problems;
- h) Use of improper packaging when sending the product for repair; and/or
- i) Fortuitous and force majeure events.