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Operator's Manual
ULTRA GUIDANCE PSR ISO TOP

Automated Steering System
for tractors and self propelled machinery
in Agriculture and Forestry

Item # 560 603

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Some illustrations may vary slightly from the actual product received. This has no impact on operation or function.

All information, illustrations and technical data in this publication represent the latest available at the time of print. Design changes may take made at any time and without notice.

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Remarks

Thank you for choosing ULTRA GUIDANCE PSR ISO. Please take the time to thoroughly read through this User Manual. It is meant for You the User. It contains all needed information for safe operation and handling of this system. The instructions are based on current regulations for worker safety and health protection, at the time of printing this manual. If you have questions about this steering system that aren't covered in this manual, please consult your nearest dealer or address questions directly to the manufacturer.

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To understand the Operator's Manual

While reading this manual, please consider the following:

Illustrations may vary from the actual components used. This may be due to different operation modes, or software versions. When ISOBUS terminals are used, hardware pictures may vary due to various placement options, and have no impact on functioning the system.

Always use original parts

Reichhardt original spare parts are designed for this steering system. They live up to highest standards of safety and reliability. Components or parts that are not provided by Reichhardt should not be used for this system because they might jeopardize the safety and function of the system. Therefore, we can not be responsible for any redesign or adaptations. Any obstinate changes on the steering system voids company warranty. In addition, conformity declaration (CE Symbol) or local authority regulations could be voided. This also applies to the removal of factory applied seals.

1. Safety

1.1. Intended use

This automatic steering system is designed to be controlled by persons working in agriculture or forestry including special cultures like vineyards, fruit trees, or vegetables. Any usage beyond recommendations is therefore prohibited. PSR ISO TOP is not suitable for applications on narrow dikes or steep hillsides, when danger of vehicle roll-over exists. It should not be exposed to areas that are in danger of explosions. Never expose the unit or individual components to chemicals such as: acids, lye, oils, lubricants or other aggressive petro-chemical materials. The manufacturer is not responsible for any damages relating to non-purpose oriented usage. The risk is the sole responsibility of the user. These purpose oriented conditions also apply to recommended operator regulations as well as service and maintenance directions.

1.2. General advice

Please read this manual thoroughly. This steering system is fabricated under respected technical regulations and expertly installed. In this manual you receive all the information required for proper operation and maintenance of the system. Please observe all reference points and directions exactly. Failure to do so could lead to personal injury or equipment damage. This manual and safety decals may also be available in other languages. Check with your dealer or our internet website.

This manual is considered a permanent part of the steering system and shall remain with the steering system in the event that it is sold to other parties.

Measurements in this manual are given in US Standard. Make sure to use correct tools.

If original brackets or parts are not used, it could potentially lead to injury or material damage caused by malfunction of the steering system. Therefore, always use approved brackets and spare parts.

1.2.1. Responsibilities of the owner

Only persons who have read and understood the complete manual should work with this system.

Only persons which are comfortable with installation, service and repair of the steering system,and also aware of possible dangers in conjunction with the job, should use the system.

Regional regulations for health protection and accident prevention must be obeyed at all times and while working with the system. Never use the system on public roads or highways.

Any changes to the steering system which are not authorized by the manufacturer, void any liability of the manufacturer in the event of a malfunction.

If you do not understand any part of this manual and need assistance please contact your dealer.

1.3. Safety symbols and advice

In this manual, the following safety symbols and caution signs are used. You are being warned about possible personal or material hazards. There are also tips to reduce stress.

Danger! This symbol warns of imminent threat of danger which could lead to serious bodily harm or death. This danger can appear when operator manuals and instructions are not being followed.

Warning! This symbol warns of a dangerous situation that could lead to serious bodily harm or death. This danger can appear when operator manuals and instructions are not being followed.

Attention! This symbol warns of potentially dangerous situations which could lead to bodily harm, damage to the machine or other major material damages. Disregard of these safety instructions can lead to loss of the warranty. This danger can appear when operator manuals and instructions are not being followed.

Advice! This symbol warns of material damage or directs your attention to tips and advice which may lighten your work load. Heeding this advice leads to more comfortable work and longer life expectancy of this equipment.

1.4. Safety decals on the system

All potentially dangerous spots on the system are also identified with warning decals (pictogram). These pictograms advise of potential dangers. They are part of the contents of this manual. Keep safety signs in good, clean, and readable condition. Be sure new components or parts include the current safety signs. The meaning of various pictograms is explained in the following text.

If needed, new decals can be ordered through a local dealer.

Attention! Read and observe the manual and safety instructions prior to operation.

Warning ! On all public roads and highways the automatic steering PSR ISO TOP must be deactivated.

1.5. Directional information in this manual

Right-hand and left-hand sides are determined by facing in the direction of forward travel.

1.6. Demands on operating and service personnel

Every person operating or servicing this system must meet the following minimum requirements:

- He/she is physically capable of controlling the machine.
- He/she is able to safely perform the work with the machine and system as specified in this operating manual.
- He/she understands the functionality of the machine and system within the scope of the work and can recognise and avoid the related hazards.
- He/she has understood the operating manual and can implement the information contained therein accordingly.
- He/she is familiar with the safe operation of vehicles.

1.7. Safety regulations

With exception of the driver, no other person should ride in the driver's area of the vehicle fitted with the steering system. Additional persons could distract or block visibility of the driver and prevent him from operating and observing the steering system.

The presence of a rider on a passenger seat is only acceptable for brief observations or training purpose. The passenger seat is never considered a children's seat. Only experienced persons, with the operation of the machine, should be considered for schooling on a machine which is fitted with the steering system.

Pay special attention that no children are near or on the vehicle, which is fitted with the steering system. This is important to be aware of as soon as the motor is running. Children are unpredictable and supervision is limited when operating the steering system.

Before starting field work, get comfortable with the use of the system and the vehicle. As soon as the steering system is activated, a responsible adult must be in charge of supervision and monitoring. In dangerous situations it is always safer to turn off the system and drive by hand in order to avoid personal injury or material damage. The steering system is automatically deactivated when the driver‘s seat is abandoned. Use the main switch to additionally shut it off.

Be prepared to steer by hand at the end of the field or track, since the system is not able to turn the machine on the headland.

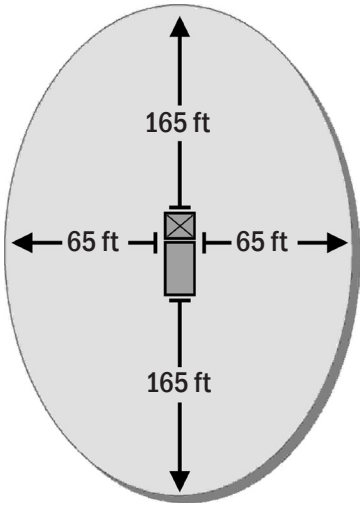
Warning! Never activate the steering system while driving on public roads! For safety reasons, it is advised to keep at least one hand on the steering wheel when using the steering system at speeds higher than 6 mph. In the event of a malfunction, action can be taken immediately.

1.8. Danger zone

At no time should there be any person within the danger zone after the steering system is activated. This danger zone is shown in the following illustration. At any sign of danger the operator should deactivate the steering system immediately. The operator can reactivate the steering system once the danger zone is clear.

For service and control duties, only authorized persons can enter the danger zone after receiving verbal confirmation with the operator. Such people have to be clearly informed about possible dangers before entering the danger zone. All activities between the operator and these persons should be discussed beforehand. All service, calibrating, and control duties on the steering system should only take place, if technically possible, on a parked vehicle with the engine turned off. It is the operator's responsibility that the vehicle can not be started inadvertently by untrained persons without previous verbal agreement.

Danger zone:



Danger! People present within the danger zone may be exposed to serious bodily harm or even death. People could be run over in the event of a possible machine malfunction. The operator is obligated to stop the vehicle as soon as people enter the danger zone.

Beware of defective or electronic lines which are not securely attached. These can cause fatal electric shocks.

Defective hydraulic lines or those which are not securely fastened can become loose and toss wildly around. High-pressure hydraulic oil can leak and cause serious injuries to the skin or face.

1.9. Preparations for emergencies

Prepare for possible emergencies:

- Always have a fire extinguisher and First Aid Kit on hand.
- Always have emergency phone numbers for fire department, ambulance and doctor on hand.

2. System Description

PSR ISO TOP is an automatic steering system for all vehicles which feature full hydraulic steering capability or for vehicles which are set up preliminary for an ISO compatible automatic steering system. It is possible to automatically steer self propelled machinery in applications like farming, forestry and specialty crops like vegetables.

PSR ISO TOP uses various sensors depending on the mode of operation to steer a vehicle along existing tracks, structures or with the help of satellite supported positioning.

Attention! PSR ISO TOP is designed to support the driver to operate the machine more efficiently. When using the PSR ISO TOP, the driver is obligated to observe his surrounding area and the machine. He should shut down the system in any dangerous situation, and revert to steering by hand.

2.1. Various Modes of Operation

PSR ISO TOP has three different application modes:

1) PSR hBasic integrates the steering system into the hydraulic system of the vehicle. It can operate with various hydraulic systems (constant flow or load sensing).

Advantages:

- Base installations on various vehicles for simple quick change of components.
- Improves steering performance through quick response times.
- Ideal for operating speeds exceeding 10 mph.

2) PSR eBasic utilizes an electric motor to activate the steering wheel.

Advantages:

- Simple installation.
- Inexpensive base installations.
- Ideal when using several vehicles.

3) PSR ISO means, that the steering valve is controlled via the existing ISOBUS in the vehicle. It is therefore suitable for all vehicles which are set up preliminary with ISOBUS steering.

Advantages:

- Plug-and-Play simple installation.
- Base installation.
- No mechanical changes on the vehicle.

2.2. Sensor Options

2.2.1. PSR SKY

PSR SKY is satellite supported high accuracy steering utilized in all applications where exact parallel tracking without existing plant rows, ridges or tram lines is possible. It may be used for increased efficiency by using full implement width in every pass. Pending customer preference, the satellite receiver can work with WAAS-, Beacon-, OMNISTAR-, EGNOS (L-Band) or RTK corrected signals. PSR SKY is also compatible with other satellite receivers which the customer may already have, provided the transmission rate 19200 Baud, NMEA 0183 compatibility and an update rate of at least 5 HZ.

Picture 1:
PSR SKY

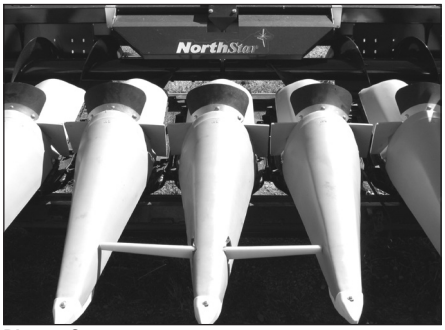
2.2.2. PSR SONIC

PSR SONIC is a driving option for precise steering along existing tracks, plant rows, ridges, or marker tracks. Sonic sensors can read many different physical structures. They are hand adjustable. With an accuracy of 1 1/4 inches, PSR Sonic is uniquely suitable for seeding, transplanting, maintenance and harvesting field and vegetable crops.

Picture 2:
PSR SONIC

2.2.3. PSR TAC

PSR TAC is the system with the greatest precision. Unique low-wear plastic paddles gently and precisely detect vegetation in closed row crops.



Picture 3:
PSR TAC

3. Installation of system components

Following strict industry standards and safety regulations, PSR ISO TOP is professionally assembled and installed before it gets used for field operation.

The PSR iBox and various sensors can be exchanged between eight different vehicles.

Any vehicle intended for PSR ISO TOP has to have PSR vBasic installed. The initial installation has to be done by personnel trained and authorized by Reichhardt for this product. In this manual we describe only the installation of system components into vehicles which are already auto steer ready.

Attention! Turn off PSR ISO TOP before attempting any installations by switching the main switch off (see chapter 4.2.).

After each hardware installation, test the complete system function with the diagnostic program (see chapter 4.9.6.). This will help to avoid malfunction through, for example, poorly fitting electric connections.

Make sure to protect connectors after each component change, by using blind caps and plugs to prevent contamination.

Warning! Sharp edges or moving parts can lead to hand or skin injuries (crushing, fissures, effusions of blood).

3.1. Installation of ISOBUS-Terminal

In case the ISOBUS terminal should be moved from one vehicle to the other, please gather information in the operator's manual of the terminal manufacturer.

3.2. Installation of steering motors

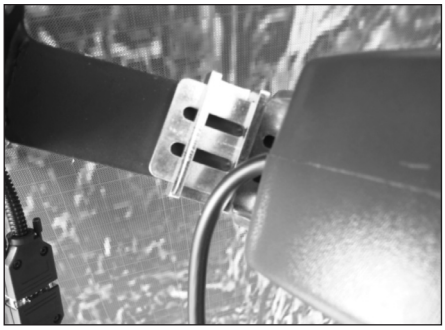
3.2.1. Installation of RDU

The Reichhardt Steering Motor RDU will be expertly installed and turned over to the customer field-ready.

Advice! Any time the steering motor is not in use, while on the road or when stopped, lock it into the inactive position so there is no contact to the steering wheel. That way the life expectancy of the steering motor RDU and its contact wheel will be greatly extended.

To install the RDU into another vehicle

- Push the mounting slider onto the holding bracket.
- Slide the holding bracket of the RDU between the steering column and the mounting slider.
- Slide the motor unit close the steering wheel so that the contact wheel, in the non action position, is approximately 1 3/4 inches.
- Fasten the RDU in this position to the steering column bracket. Tighten the thumb screw beneath the slider by hand. Do not use any tools.
- Connect the connecter cable of the RDU motor to the cable harness of the vehicle.
- To activate automatic steering grab the motor friction wheel and push it away from the steering wheel. The locking device releases, and the motor is drawn towards the steering wheel. The RDU steering assistant is now operation ready.
- During active operation, if the steering wheel is not getting enough force, the contact pressure may be too low. Slide the RDU motor closer to the steering wheel or increase the spring tension.



Picture 4:
Slide RDU into the mounting slider

Picture 5:
RDU in operating position

Advice! By marking the optimal position on the mounting bracket now, it will be useful to refer to it during the next vehicle installation.

Attention! Keep hair, clothing, gloves, necklaces and other jewellery away from moving parts! Long hair, loose clothing, jewellery or similar loose parts can become caught in moving components.

Do not insert your fingers between the mounting base and mounting slider. This can cause injuries.

3.2.2. Use of other steering motors

Steering motors of competitive brands can be integrated into the Reichhardt steering system, if it is technically possible. Reichhardt will provide the necessary cables and adapters. The installation and adaptation to other vehicles is described in the operator manual of the manufacturer of such motors.

3.3. Installation of the gyroscope

A location for the gyroscope is already designated during basic installation. Place the gyroscope horizontal at this location of the vehicle with the magnetic foot pointing down.

Attention! Never install the gyroscope with the magnetic foot pointing up!

Connect the connector cable of the gyroscope with the required plug X_{08}.

Picture 6:
Gyroscope

3.4. Installation of Ultra Sound Sensors

Sensors do not require programming prior to use.

When switching vehicles, installation follows the same guide lines as used during first installation. After installation the connector plug of the sensors is inserted into the receiver of the vehicle. The placement and angle of the sensors depends on the field application (see chapter 6.1.).

Advice! The gauge reading measurements in the diagnostics program (see chapter 4.9.6.) should range between 20 and 28 inches. When the sensor is properly aligned with the guide structure/tram-line, it will find a reading of 59 inches. In case the sensor is not positioned correctly or defective, swing it to a different position and test it again.

Picture 7:
Sonic sensors side by side

Picture 8:
Sonic sensors behind each other

3.5. Installation RGS/GPS-Systems

Place the RGS 100 receiver with the magnetic foot on top of the mounting plate on the vehicle. Place the RGS 320 receiver on to the mounted bracket and tighten it.

After the GPS receiver is mounted, route the receiver cable and connect it with X_{19} on the cable harness X_B and X_{09} on the cable harness X_A (only with RGS-RTK).

Advice! Pay attention when routing the cable that it does not get exposed to sharp corners or edges to avoid chafing. Also make sure it is free of mechanical loads such as tension.

Picture 9:
Reichhardt RGS 100 receiver

Attention! Depending how the system is configured by authorized service, the GPS system could be under constant electric load. This could slowly drain the vehicle battery during lengthy interruptions of the operation. As soon as the PSR iBox is removed from the vehicle, the electric current to the GPS receiver is interrupted. If the electric current of the GPS receiver comes through the PSR iBox, the electricity to the GPS receiver is interrupted as soon as the system is switched off. 20 to 30 minutes of warm-up may be required when restarting.

Picture 10:
Reichhardt RGS 320 receiver

3.6. Removal of individual components

The de-installation of individual components follows in reverse logical order as described in the installation directions.

Advice! During disassembly make sure to properly close plugs and receivers with provided blind covers.

Attention! Connect the cable X_A and X_B to the blind connectors on the bracket for the PSR-iBox and lock in place with the safety slide.

4. Operation

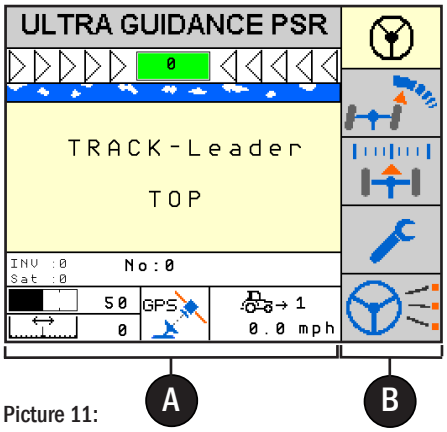
4.1. Operating interface ISOBUS terminal

All settings are made via the ISOBUS terminal.

The display is split in two areas:

Zone Ⓐ: Contains information to the current drive mode.
Zone Ⓑ: Function keys for operation.

The input is menu directed and multilingual over five function keys, which change their function depending on the displayed symbols in zone Ⓑ. Details are found within the appropriate drive modes.



Picture 11:
Main screen

4.1.1. Function keys

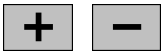
The touching of function key Ⓑ result in one of the items listed here:

Activate/deactivate steering

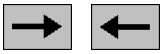
 = Error message: steering cannot be activated.

 = Automatic steering deactivated.

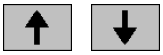
 = Automatic steering activated.

Plus / Minus key 

- Changes numerical values.

Arrow right / left 

- Scrolls through the menus.
- Functions as electronic dial.

Arrow up / down 

- Scrolls through the menus.

Enter key 

- Confirms the selected menu selection/input.

Main Menu 

- The main menu switches in the main screen.
- Switches into the Teach-Menu of the corresponding drive mode when briefly pressed.

Drive Mode Setting 

- Allows you to change the drive mode.
- Confirms a selected drive mode.

Escape 

Jumps back by one menu level or interrupts actual input and returns to previous setting.

Reaction Setting 

(take the instructions to setting this menu from the manual of TL-TOP)

Re-Center/Nudge (not adjusted for the driving modes GPS and SONIC) 

- Enters the re-centering menu.
- Modifies nudge value.

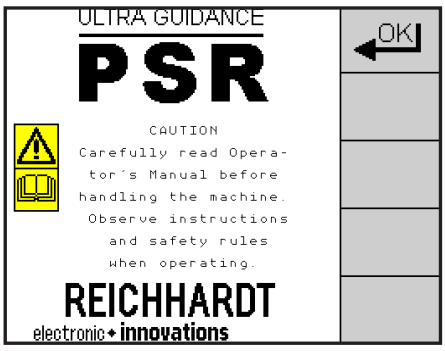
4.2. On and off switch of PSR ISO TOP

By pressing the main switch PSR ISO TOP is activated. After the application pressing the main switch again. Depending on the vehicle an applicable main switch is installed. Please ask the service technician where the main switch was installed.

Read the safety instructions and confirm by pressing the Enter key 

.

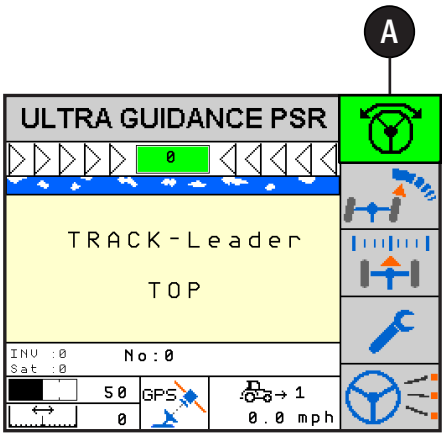
Attention! PSR ISO TOP has to be turned OFF at the end of field work and before entering public roads by the main switch.



Picture 12:
Safety information

4.3. Activation and Deactivation of PSR ISO TOP

By the displayed symbol of the function key Ⓐ you see the current status of the steering system. The symbol  shows, that PSR ISO TOP is active. If you see symbol  PSR ISO TOP is deactivated.



Picture 13:
Main screen (steering activated)

Activating PSR ISO TOP:

The system can only be activated when the main screen is on.

- By pressing the function key  .
- By activating the foot switch.
- By the menu TL-TOP.

Deactivating PSR ISO TOP:

- By pressing the function key  .
- By the menu TL-TOP.
- By activating the foot switch.
- By switching the main switch ON/OFF.
- By manually moving the steering wheel.

The system will deactivate automatically:

- When driving speed is too high.
- When experiencing a system malfunction.
- When opening the cab door or leaving the drivers seat (if activated at set up).

4.4. Main screen

The display on the main screen is dependent on the current application.

A - Spacing

Display of the actual center offset setting.

B - Reaction level

Display of the actual reaction level setting for the selected drive mode.

C - Drive mode

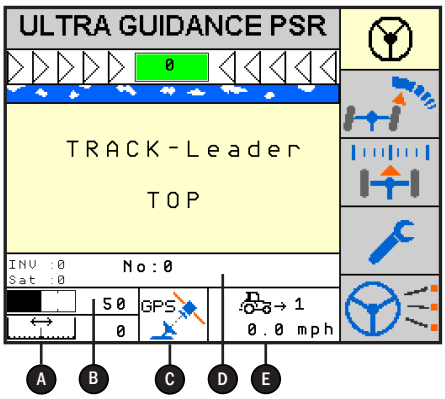
Display of the current drive mode.

D - Information display

Main information display.

E - Vehicle information

Display of the vehicle number and actual drive speed.



Picture 14:
Main screen GPS

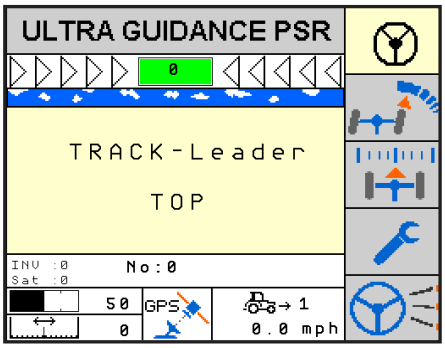
4.5. Select drive mode

PSR ISO TOP represents auto steering by utilizing various guide line sensing devices. The guide line comprehension depends on the sensor and is described as drive mode. Before working with PSR ISO TOP, set the desired drive mode. PSR-SKY and PSR-TAC identify already the respective drive mode. There are 9 drive variations for the ULTRA SONIC mode. The differences are identified by the mounting of the sensors.

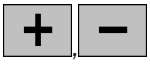
4.5.1. Automatic Drive modes

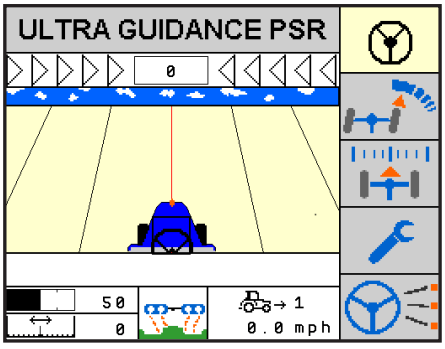
Display: Main screen

Press the function key  until the symbol flashes.



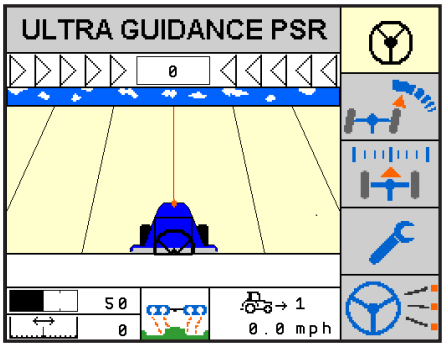
Picture 15:
Main screen

Select by the function keys  the desired drive mode.



Picture 16:
New drive mode selected

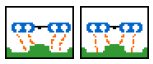
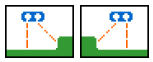
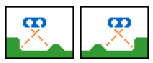
Press the function key  briefly to store the selected drive mode and to return to the main screen.



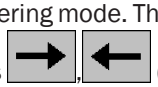
Picture 17:
New drive mode activated

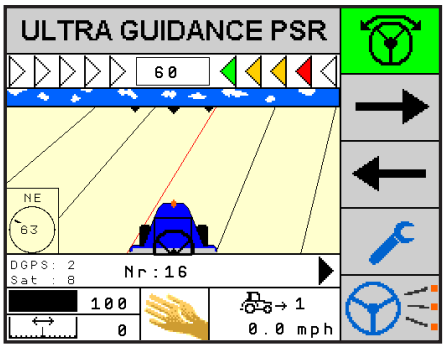
Advice! If the drive mode setting is not completed correctly, the selected drive mode is reject and the previously set drive mode remains activated.

The following drive modes are available depending on the selection of the system. (Detailed information about various drive modes are found in respective chapters):

PSR TAC	
PSR SKY	
PSR MEC (not available in Europe)	
PSR SONIC Swath in center/ swath zig zag	
PSR SONIC drive track cross wise	
PSR SONIC drive track outside	
PSR SONIC crop edge with correction left/right	
PSR SONIC crop edge cross wise left/right	
PSR SONIC crop edge left/right	

4.5.2. Drive mode manual

A quick touch of the function key  can switch between automatic steering or manual steering mode. The vehicle can now be steered with the function keys  (steering by wire).



Picture 18:
Steering by wire activated

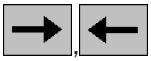
4.6. Spacing setting

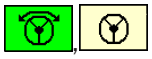
Display: Main screen

Spacing identifies the distance of the machine to the default line. The setting of these values are needed to allow the implement to continue to seamlessly work lines.

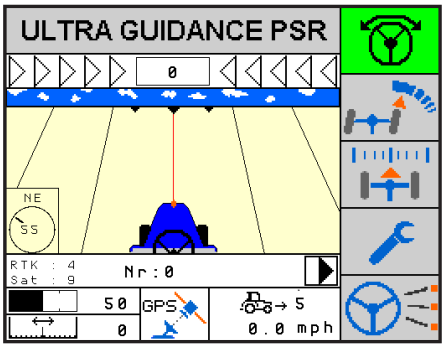
Press the function key  until the symbol flashes.

Advice! Not adjusted for the driving modes GPS and SONIC.

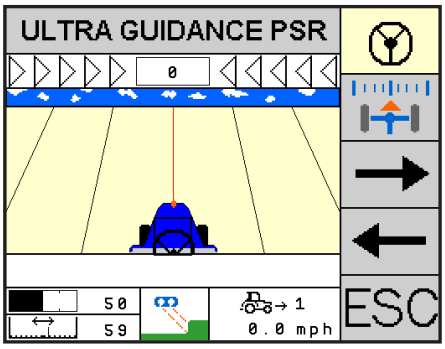
Pressing the function keys  sets the distance. The range of settings is between + 12 and + 35 inches for the distance to the crop edge. Or between -20 and +20 inches for the distance to the center of the vehicle. The setting information will be stored with the actual drive mode in the system.

Advice! Pressing the function keys  will disengage the steering system when changing the spacing setting.

Tap the function key  to store the spacing level.



Picture 19:
Drive mode with center offset



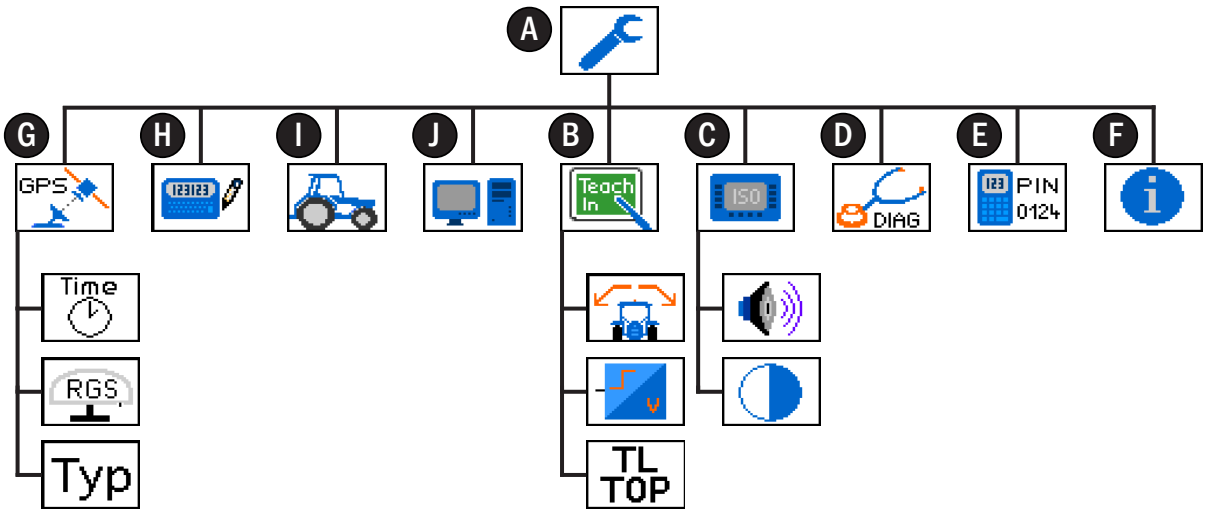
Picture 20:
Drive mode with distance to the crop edge

4.7. Reaction setting

Take the instructions to setting this menu from the manual of TL-TOP.

4.8. Menu-Structure

PSR ISO TOP is steered with the help of stored menus. The menu in the PSR cBox is built up on 4 levels for simple operation.



Picture 21:
Menu structure

- **A** – Main Menu
- **B** – Teach-In
- **C** – Terminal
- **D** – Diagnostic
- **E** – Service menu
- **F** – System information
- **G** – GPS receiver settings
- **H** – Calculator
- **I** – Vehicle number
- **J** – Computer settings

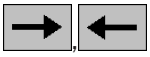
4.9. Main Menu

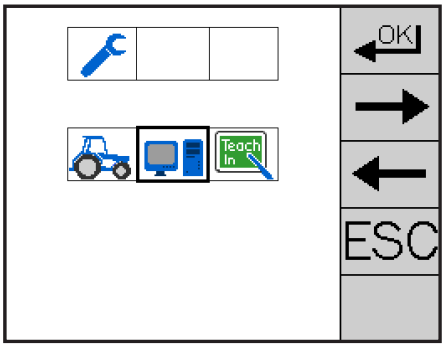
Display: Main screen

Press the function key  until the main screen shows up at the display.

The upper line in the main menu shows in which position the system is presently set. The lower line shows the related menus.

As illustrated the field in the middle (current selection) is accentuated by a bold frame.

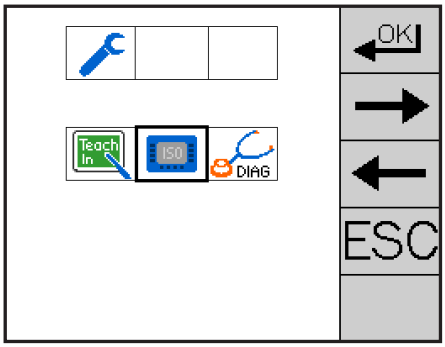
Press the function key  , to browse to the required symbol. Press the function key  to select the accentuated field.



Picture 22:
Main menu

4.9.1. ISOBUS terminal settings

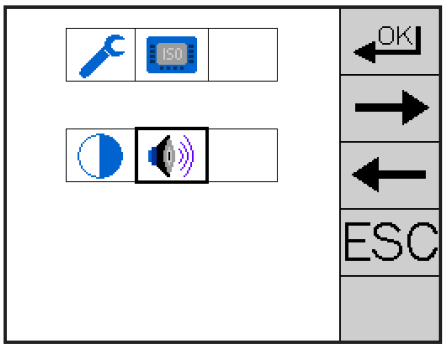
At the ISO operating unit the operator can adjust sound level and contrast. Choose  and confirm the selection.



Picture 23:
Settings ISO operating unit

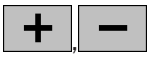
Sound level setting

Choose  and confirm the selection.

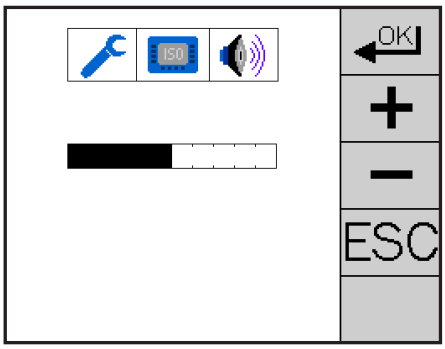


Picture 24:
Choose sound level

The setting of the actual loudness of the sound strength shows in bars on the monitor.

Press the function keys  to adjust the sound to the desired level. Each new level is checked by a control sound with the new setting.

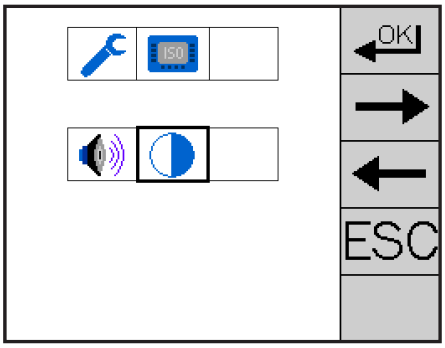
Press and hold the function key  until the save screen appears. Proceed as described in chapter 4.12.



Picture 25:
Set sound level

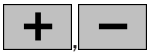
Contrast adjustment

Choose  and confirm the selection.

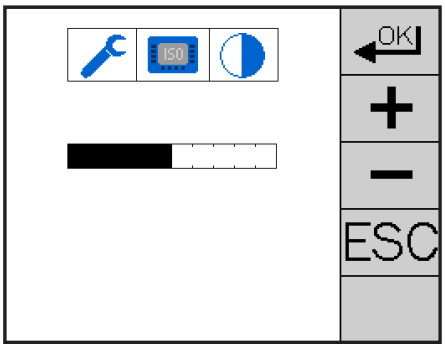


Picture 26:
Choose contrast

The contrast for the display is shown on the monitor.

Press the function keys  to set the desired contrast. You already see the modification while you enter it.

Press and hold the function key  until the stored symbol appears. Proceed as described in chapter 4.12.



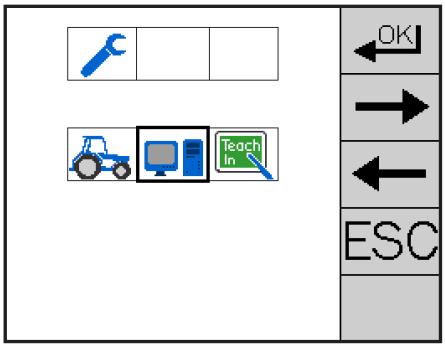
Picture 27:
Set contrast

4.9.2. Computer Setting

This is the area where language and measurement unit are set.

Choose  and confirm the selection.

Advice! The language and units of the ISO terminal settings are always accepted. Please consult the manual of the respective ISO terminal manufacturer for more information.



Picture 28:
Select Computer settings

Set language

Press the function keys  for parameter “No: 5” and adjust the value, as described in chapter 4.11., to the requested one.

No: 5 = language

Val: 0 = German

Val: 1 = English

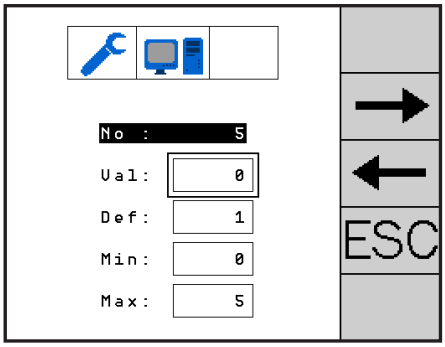
Val: 2 = French

Val: 3 = Dutch

Val: 4 = Polish

Val: 5 = Romanian

Val: 6 = Spanish



Picture 29:
Set language

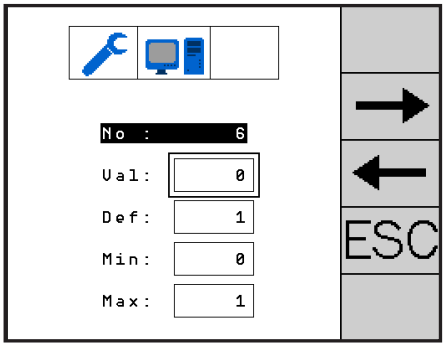
Enter settings

Press the function keys  for parameter “No: 6” and adjust the value, as described in chapter 4.11., to the requested one.

No: 6 = measurement unit

Val: 0 = metric

Val: 1 = US Standard

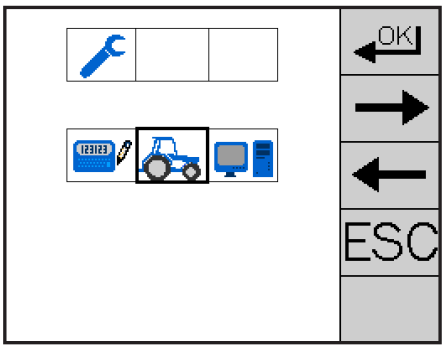


Picture 30:
Set measurements

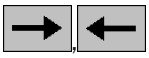
4.9.3. Set measurements

PSR ISO TOP can store settings of up to eight different vehicles. All vehicle settings will be stored under one number. When switching the PSR iBox to another vehicle, choose the vehicle number under which the stored information is found.

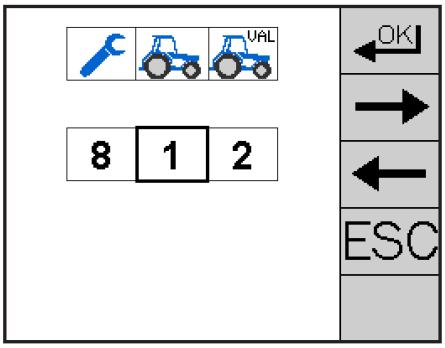
Choose  and confirm the selection.



Picture 31:
Set vehicle number

Press the function keys  , to select the required vehicle number.

Press and hold the function key  until the stored symbol appears. Proceed as described in chapter 4.12.



Picture 32:
Selection of vehicle number

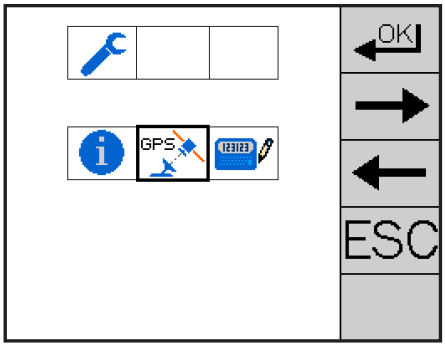
4.9.4. Setting the GPS receiver

In order to connect a GPS receiver to the automatic steering system, settings must be made accordingly.

Advice! A GPS receiver is required for PSR SKY operation. In addition, the GPS receiver can be used as a speed sensor for all other drive modes.

Choose 

and confirm the selection.



Picture 33:
Selecting set GPS receiver

Setting the RGS receiver

RGS receivers refer to GPS receivers which can be purchased directly from Reichhardt. The distinction is made here between GPS receivers which process DGPS correction signals and those which are RTK capable. This affects the precision which you can obtain with your steering system.

The settings of the RGS receiver can be adapted to your personal applications. The RGS receiver has 2 ports.
An PSR ISO TOP is connected to the port “PSR”. The port “Other” is freely available for your personal requirements, e.g. for surveying.

Advice! These functions are only available to you if you use an RGS receiver.

Choose 

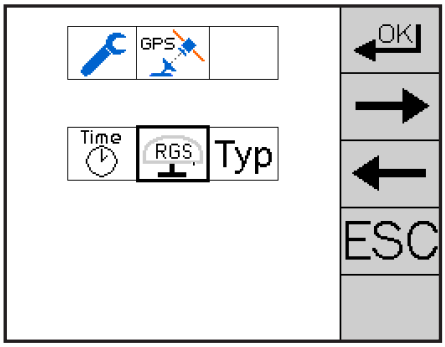
and confirm the selection.

Advice! If 

is not visible, 

must be set to 

.

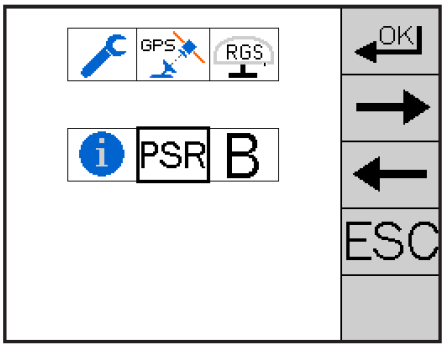


Picture 34:
Setting set RGS receiver

Setting port “PSR”

Choose PSR and confirm the selection.

Advice! For PSR ISO TOP, it is recommended to set RMC messages to 10Hz and GGA messages to 1Hz. All other messages should be set to “off”.

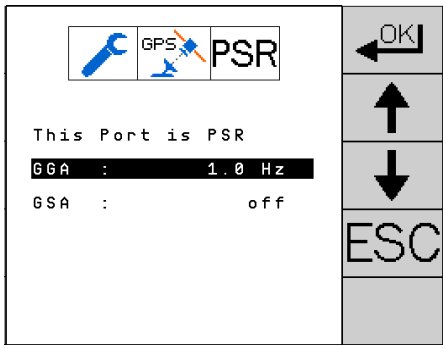


Picture 35:
Selecting port “PSR”

Press the function keys ↑, ↓ to select the desired setting.

Briefly press the function function key OK to change the setting.

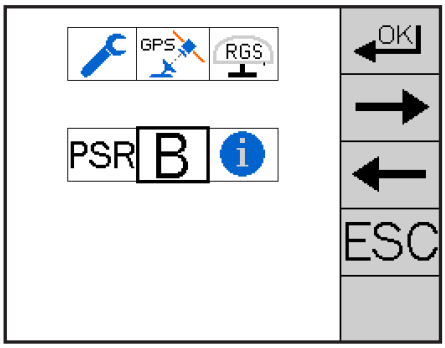
Press and hold the function key OK until the stored symbol appears. Proceed as described in chapter 4.12.



Picture 36:
Setting port “PSR”

Setting port “OTHER”

Choose B and confirm the selection.



Picture 37:
Selecting port “OTHER”

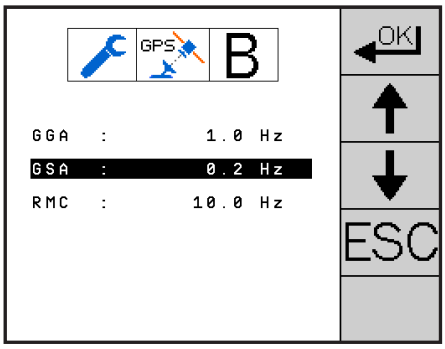
This port is freely available to you and can be set according to your needs. You can make the following settings:

- GGA : 0.2 - 10Hz
- GSA : 0.2 - 10Hz
- RMC : 0.2 - 10Hz
- ZDA : 0.2 - 10Hz
- VTG : 0.2 - 10Hz
- GLL : 0.2 - 10Hz
- GSV : 0.2 - 10Hz
- GST : 0.2 - 10Hz
- RRE : 0.2 - 10Hz
- Baud: 4800 - 115200 baud

Press the function keys ↑, ↓ to select the desired setting.

Tap the function key OK to change the setting.

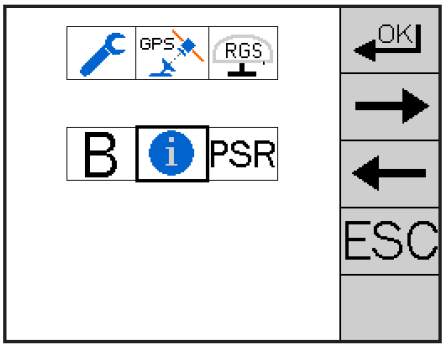
Press and hold the function key OK until the stored symbol appears. Proceed as described in chapter 4.12.



Picture 38:
Setting port “OTHER”

General RGS receiver settings

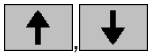
Choose  and confirm the selection.



Picture 39:
Selecting general RGS receiver settings

In this menu general settings for the GPS receiver are made. You can make the following settings:

- NP : number of decimal places, 5 - 7 possible.
- Appl : Shift application. Depends on GPS receiver, e.g. RTK <-> WAAS/EGNOS
- PRN 1: Reference satellite 1
- PRN 2: Reference satellite 2
- Diff : Difference mode. Depends on GPS receiver.

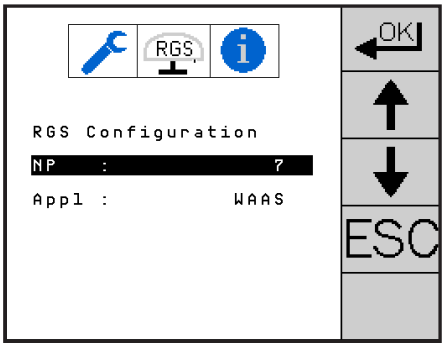
Press the function keys  to select the desired setting.

Tap the function key  to change the setting.

Press and hold the function key  until the stored symbol appears. Proceed as described in chapter 4.12.

Advice! The setting for “NP” always should be set to 7. This way you receive the highest accuracy for the positioning of the GPS receiver.

Advice! PRN 1 and PRN 2 must always be set identically.



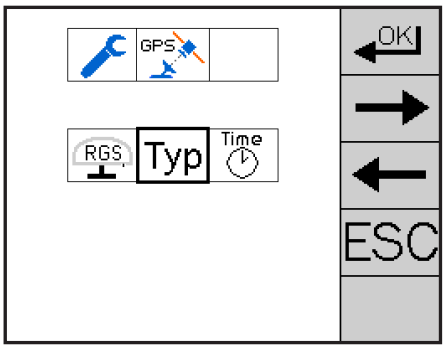
Picture 40:
General RGS receiver settings

GPS receiver type

Here you can choose from among 3 protocol types depending on the GPS interface on the vehicle.

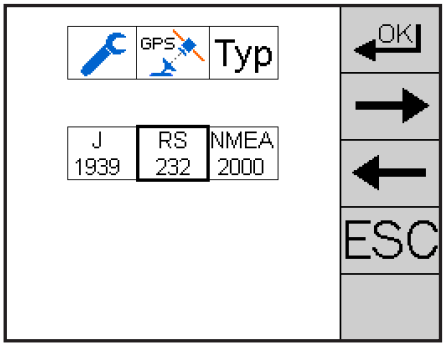
Choose Typ and confirm the selection.

Advice! Typ is only available if the current type is RS 232. Otherwise the menu directly jumps to “Set type”.



Picture 41:
Select type

Press the function keys → , ← to select the desired type.



Picture 42:
Set type

The protocol RS 232 is a serial interface. GPS messages are evaluated which are received in the format NMEA_0183.

Advice! It is recommended to use the following settings:

- RMC = 10 Hz, GGA = 1 Hz

or

- GGA = 5 Hz, VTG = 5 Hz

Protocols NMEA 2000 and J 1939 are standard CAN BUS protocols. One of these protocols is supported depending on the GPS receiver used; please refer to the manual of the respective GPS receiver:

J 1939 VDS and VP each 5-10 Hz

NMEA 2000 PRU and CSRU each 10 Hz, GNSS - 1 Hz

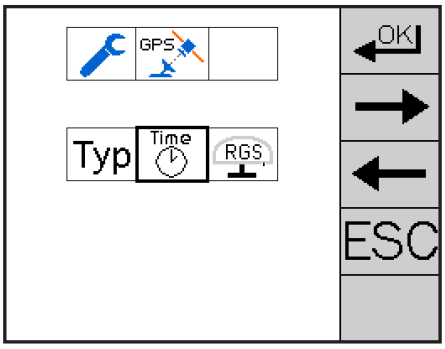
GPS after-run time

The set GPS after-run time determines how long the GPs receiver is supplied with power during a pause.

Advice! Processing can be continued quickly after short pauses.

Attention! During a pause, the GPS receiver should always have an unobstructed view of the sky.

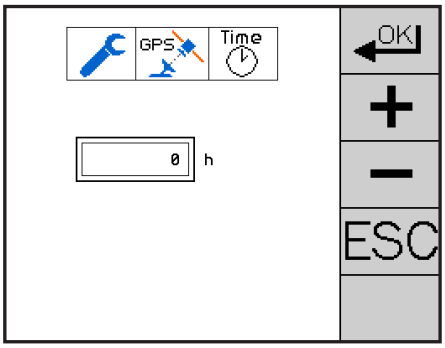
Choose Time and confirm the selection.



Picture 43:
Selecting Time

Press the function keys + , − to set the desired after-run time. Alternatively, you can also set the value manually as described in chapter 4.11.

Press and hold the function key OK until the stored symbol appears. Proceed as described in chapter 4.12.

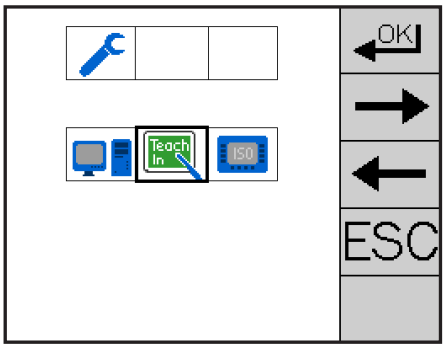


Picture 44:
Setting the time

4.9.5. Teach-In Menu

Choose  and confirm the selection.

In the teach-in menu, you can set the desired speed sensor and tilt sensor. In addition, you can switch the TRACK-LEADER TOP mask on and off.



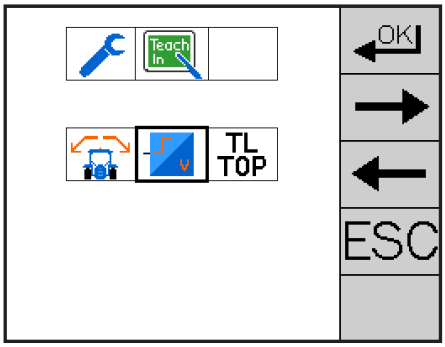
Picture 45:
Selecting Teach-In

Setting the vehicle speed

A speed is required for PSR ISO TOP to take over automatic steering. The vehicle steers from a speed of 0.25 mph. The speed can be detected in three ways:

- GPS receiver
- Speed pulses from the vehicle/radar sensor
- ISO bus 11783

Choose  and confirm the selection.



Picture 46:
Selecting vehicle speed

Selection of speed sensors

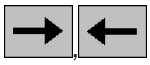
Advice! Depending on the current speed sensor, one of the adjacent images will appear.

The speed type is used to set which signal should be used to detect the current speed.

If the speed is currently detected by the vehicle/radar sensor, select 

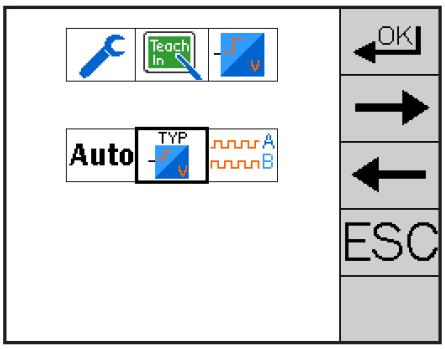
and confirm the selection.

If the current speed is being detected by the GPS receiver or ISO bus 11783, the menu will switch directly to the selection menu for the speed signals.

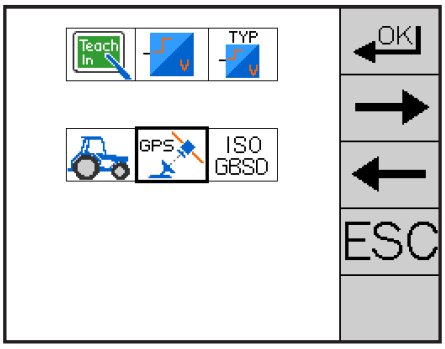
Press the function keys  , to set the speed type.

Press and hold the function key 

until the stored symbol appears. Proceed as described in chapter 4.12.



Picture 47:
Selecting the menu



Picture 48:
Selecting vehicle speed

The following speed sensors are available for selection:

GPS: Speed signal from GPS receiver.

ISO GBSD: ISO BUS 11783 message. Ground Based Speed. This speed is measured on the ground. The speed could be detected by radar sensor, for example.

ISO WBSD: ISO BUS 11783 message. Wheel Based Speed. This speed corresponds to the speed at wheel including slip.

Incremental sensor: Speed pulses from the vehicle/radar sensor.

If the current speed is being detected by the GPS receiver or ISO bus 11783, the menu will switch directly to the selection menu for the speed signals.

Using an incremental sensor

Choose  and confirm the selection.

Press and hold the function key 

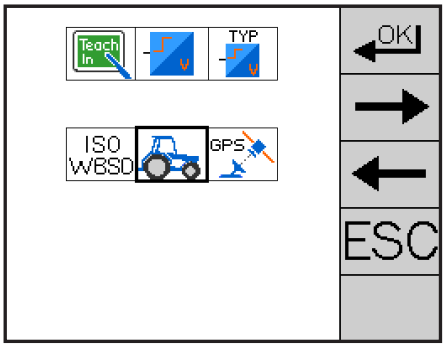
until the stored symbol appears. Proceed as described in chapter 4.12.

After confirming the selection, the following menus are available for selection:

Speed sensor type: Selection of speed sensors.

Incremental: For setting the speed pulses manually.

Auto: For setting the speed pulses automatically.



Picture 49:
Setting the incremental sensor

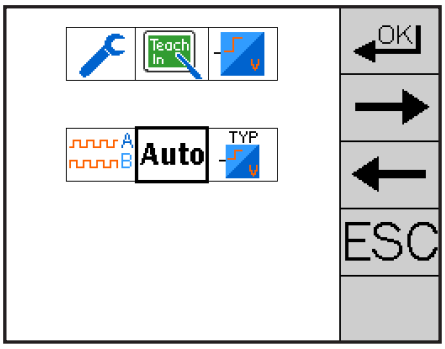
Advice! If the speed signal from the vehicle/radar sensor is used, the increments must also be set.

If the current speed is being detected by the GPS receiver or ISO bus 11783, the menu will switch directly to the selection menu for the speed signals.

Automatic speed calibration

In order to calibrate the speed between the tractor meter and PSR ISO TOP automatically, a distance of exactly 328 ft must be driven.

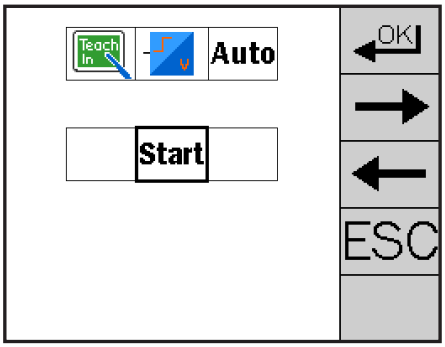
Choose **Auto** and confirm the selection.



Picture 50:
Calibrating speed automatically

Choose **Start** and confirm the selection.

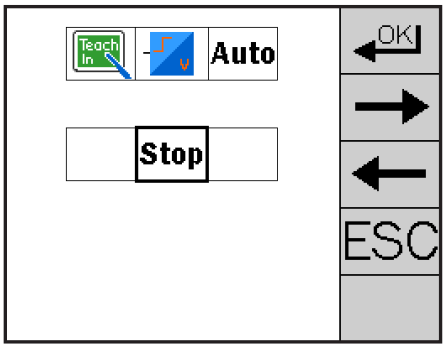
Now drive for a distance of exactly 328 ft.



Picture 51:
Automatic speed Start

Choose **Stop** and confirm the selection. Proceed as described in chapter 4.12.

Advice! Check the taught speed calibration in the menu **"Manual entry of speed increments"** and correct the speed calibration if necessary.

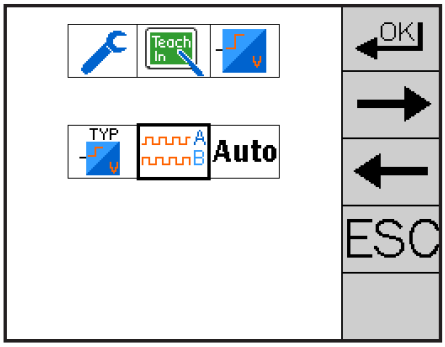


Picture 52:
Automatic speed Stop

Entering the speed manually

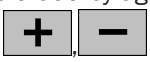
Here you can set the speed between the tractor meter and PSR ISO TOP manually.

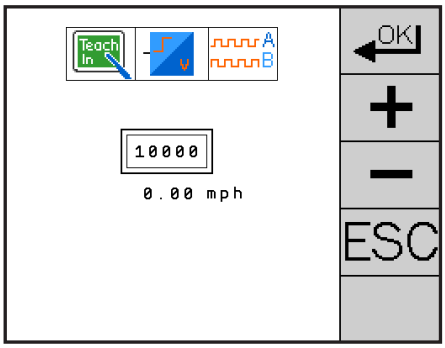
Choose  and confirm the selection.



Picture 53:
Manual speed selection

Now you can set the differential speed between the PSR ISO TOP and the tractor meter so that they agree with each other.

Press the function keys  to set the speed pulses. Alternatively, you can also set the values manually as described in chapter 4.11.



Picture 54:
Setting the speed manually

Advice! To check the set increments, drive the vehicle keeping your speed as closely as possible to 3 mph. Compare the driving speed of the vehicle with the speed indicated on the display.

If the speed indicated on the display is too high, increase the speed increments.

If the speed indicated on the display is too low, decrease the speed increments.

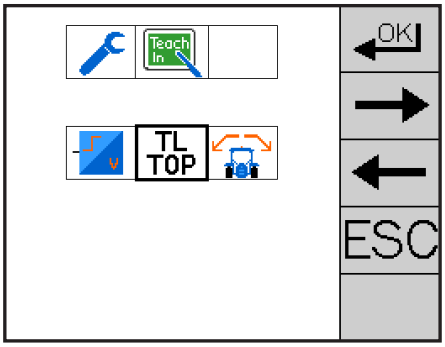
Check the different driving speeds.

Press and hold the function key  until the stored symbol appears. Proceed as described in chapter 4.12.

Switching TRACK-LEADER TOP on/off

TRACK-LEADER TOP allows you to expand the functional scope of PSR ISO TOP.

Choose TL TOP and confirm the selection.

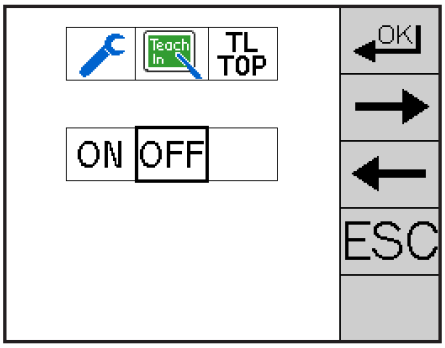


Picture 55:
Selecting TRACK-LEADER TOP

Choose ON, OFF to switch the TRACK-LEADER TOP on or off.

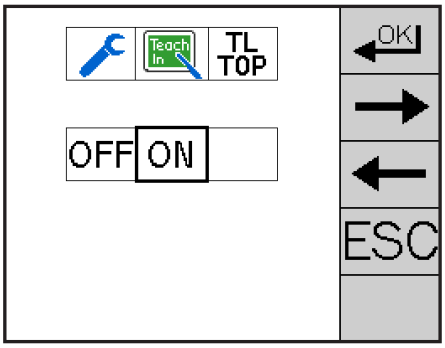
ON = switch TRACK-LEADER TOP on.

OFF = switch TRACK-LEADER TOP off.



Picture 56:
Switching TRACK-LEADER TOP off

Press and hold the function key OK until the stored symbol appears. Proceed as described in chapter 4.12.

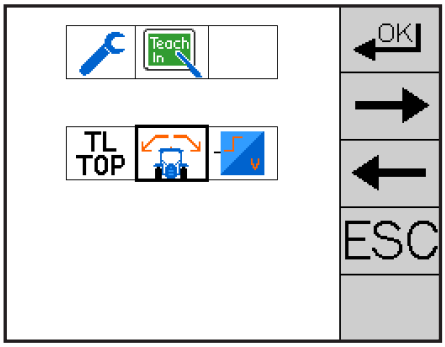


Picture 57:
Switching TRACK-LEADER TOP on

Setting the tilt sensor

This menu item is for switching the tilt sensor on/off and for calibrating the tilt sensor.

Choose  and confirm the selection.



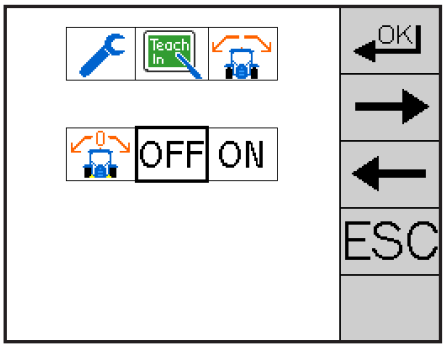
Picture 58:
Selecting the tilt sensor

Switching the tilt sensor on/off

Select ON, OFF to switch the tilt sensor on/off.

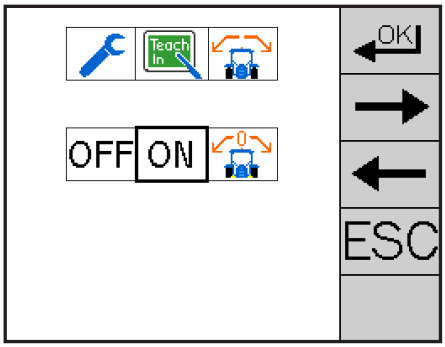
ON = switch tilt sensor on.

OFF = switch tilt sensor off.



Picture 59:
Switching the tilt sensor off

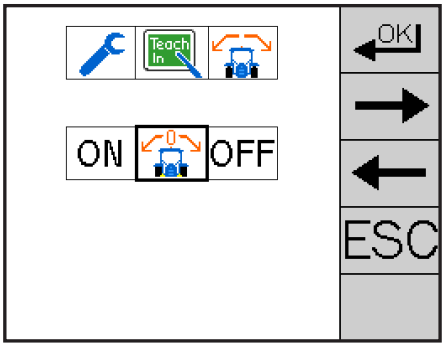
Press and hold the function key  until the stored symbol appears. Proceed as described in chapter 4.12.



Picture 60:
Switching the tilt sensor on

Calibrating the tilt sensor

When using a tilt sensor, its zero position must be calibrated.

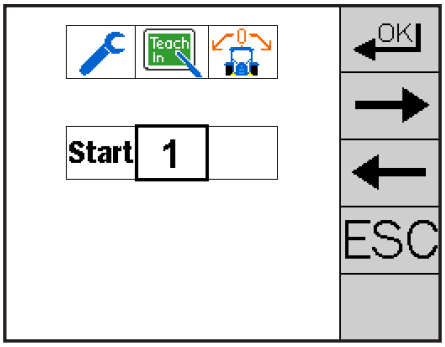


Picture 61:
Selecting Calibrate tilt sensor

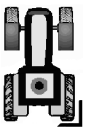
Choose  and confirm the selection.

Advice! Calibrate the vehicle on an even surface to obtain the most precise possible results.

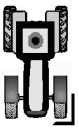
A flashing “1” will now appear on the display. Select the wheel position on the ground. Confirm this position by pressing the function key  .



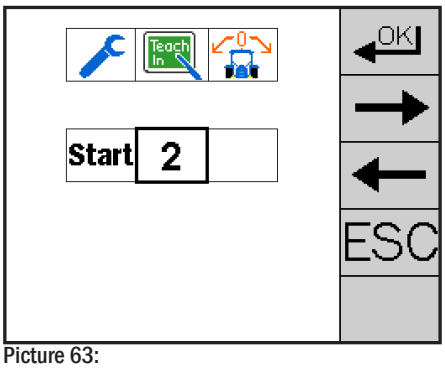
Picture 62:
Calibrating position 1



Turn the vehicle by 180° and place the wheels exactly on the previously selected wheel positions.



A flashing “2” will now appear on the display. Confirm this position by pressing the function key  . Proceed as described in chapter 4.12.



Picture 63:
Calibrating position 2

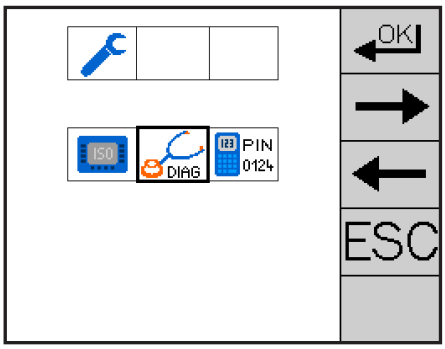
4.9.6. Diagnostic

The diagnostic program gives an overview of the current conditions of the system. It also can help identify malfunctions.

Advice! To avoid problems with electric connections, be advised to check all input for proper function after switching between vehicles.

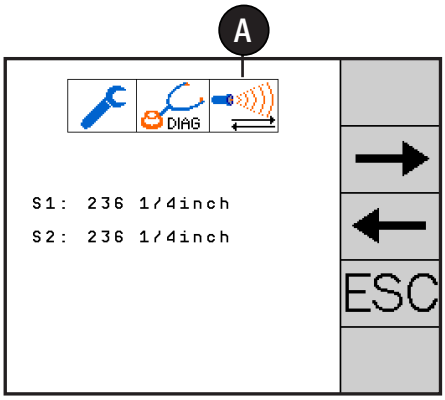
Choose 

and confirm the selection.



Picture 64:
Selecting Diagnostic

On the screen, the upper line shows the sensor Ⓐ. The lower line displays the corresponding values.



Picture 65:
Diagnostic menu

Ultra sound: When these are connected via the front coupler, it shows the distances of the sensors to the selected measuring object. If a value of 59 inches shows, the sensor is not connected, wrongly adjusted or defective.

Gyroscope: When traveling left the value lowers, when traveling right the value increases. During stand still it should show about 500, and when standing still the value should not fluctuate.

-42,97 = rotation to left 20,03 = rotation to right

Tilt sensor: In a parked vehicle, sitting level, the value should be about 450. A slight tilt to the left the value drops, a slight tilt to the right and the value increases.

-0,023 = tilt to left 1,025= tilt to right

Mechanical row finder: Displays the actual position of the receiver tool. When moving the receiver tool, the value increases or decreases accordingly.

TAC-Sensor: The display shows the actual values of the sensors (S1/S2 and/or S3/S4 depending configuration). When the paddle is at rest, a value of 50 should show. While moving the sensor, the value increases and should not exceed 500.
Contact an authorized dealer if values under 40 or over 500 are showing, or if nothing changes when moving the wand.

Wheel angle sensor: It shows the current angle relative to the axle. If the angle changes with the help of the steering wheel, the value either increases or decreases accordingly.

Danger! Faulty signal reception could be life threatening. If, when moving the steering wheel, the steering axle moves, but the displayed value does not change, the automatic steering system must be stopped immediately. Call authorized service and make sure, that the vehicle will not be used with automatic steering until authorized service clears it for such operation mode again.

Safety Switch: The screen shows the status of the safety switch. When opening the cab door or activating the seat contact switch the value changes from 0 to 1 or vice versa.

Speed: The actual vehicle speed is shown.

Pressure sensor: The value shown should change when turning the steering wheel. During stand still the value should be between 165 and 200.

RDU impulse counter of the steering motor: If the friction wheel is turned manually, both values should change with rotation.

Foot Switch: “0”= Switch not activated; “1” = switch activated.

GPS: In several menus the actual values of the GPS receiver are shown.

- The values for Lon. / Lat. are the coordinates of the GPS receiver. They should constantly change when in motion. In a parked vehicle only small variations should be seen after the third decimal. Stronger variations suggest of considerable satellite drift when parked.
- Quality: Signal quality of the GPS receiver.
- Date and time correspond not to the actual local time but GPS-Time.
- Heading: Shows the driven compass angle.
- Sat: Number of currently received satellites.
- HDOP: Accuracy of the position. The higher the value the worse the positioning.
- Reference-ID: ID of the reference signal used.
- Display of current updates.
- Display of update data of the messages displayed by the GPS receiver.

The actual hours and miles driven with automatic steering are displayed. The value shown under Code is required when asking about service questions.

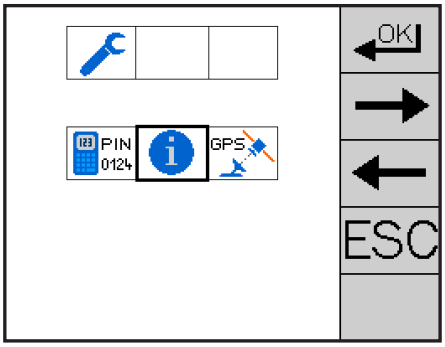
Display of the steering mode.

In several menus various values like voltage, Baud rate and CPU-load, as well as failure state for the CPU are seen.

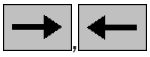
4.9.7. System Information

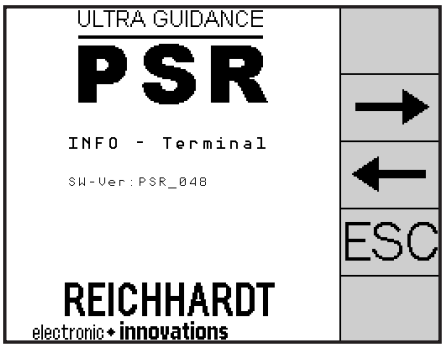
The information menu answers questions about the software version and the serial number of the PSR ISO mask and the PSR iBox. Information about a dealer or service partner is also shown.

Choose  and confirm the selection.



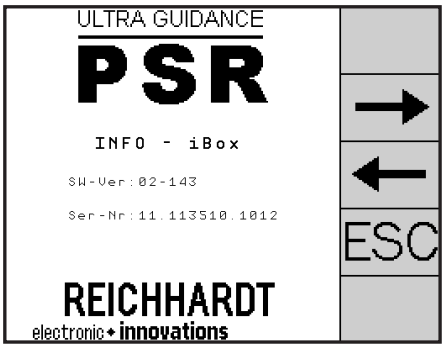
Picture 66:
System information

Press the function keys  to find the next information page.



Picture 67:
Information page PSR ISO mask

Advice! Have this information on hand when contacting customer service.

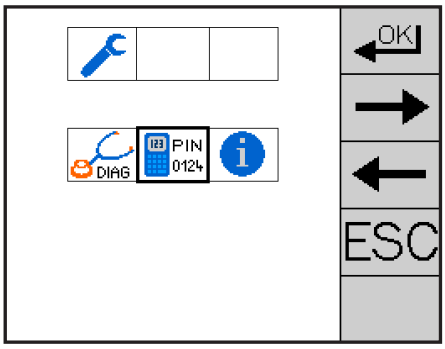


Picture 68:
Information page PSR iBox

4.9.8. Service menu

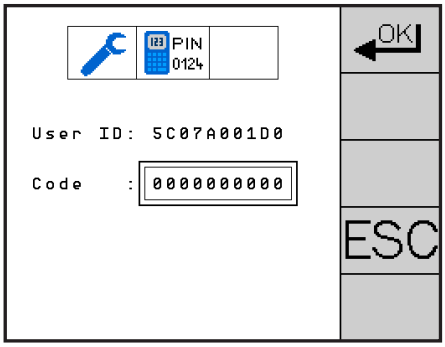
Choose 

and confirm the selection.



Picture 69:
Service Menu

Attention! For safety reasons access is only provided to authorized service personnel.

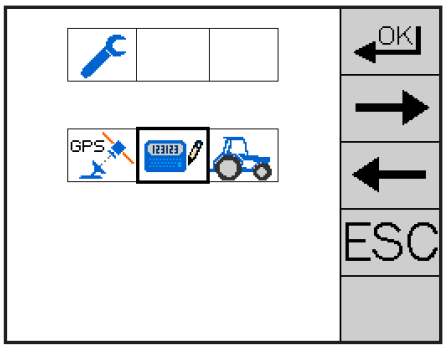


Picture 70:
Enter - PIN

4.9.9. Calculator

In the menu Calculator, you can execute numerical calculations.

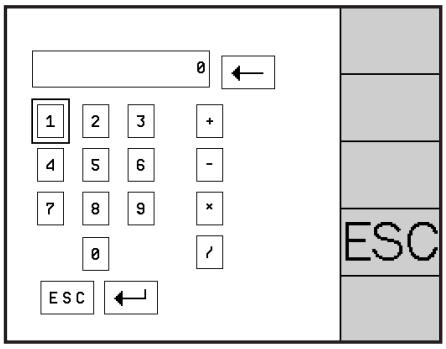
Choose  and confirm the selection.



Picture 71:
Select Calculator

The result is displayed by pressing the button  .

The current entry is cancelled by pressing the button  .



Picture 72:
Calculation

Advice! Press the function key ESC to return to the main menu.

4.10. Setting parameters – Adjusting values

The menu Set parameters is used to adjust or reset all the required parameters.

Advice! The function key ESC can be used at any time to cancel all changes and to leave the menu.

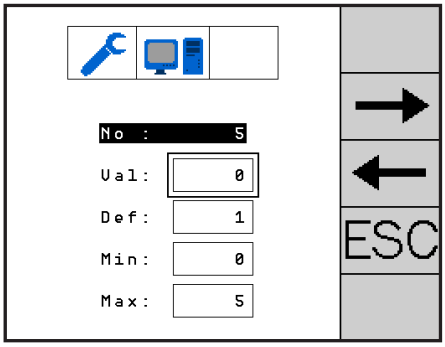
Advice! The function key OK only appears when you have made an entry. The data is accepted when you press this function key. Proceed as described in chapter 4.12.

Parameter selection

Each parameter is designated by a number.

- Press the function keys → , ← until the desired parameter is shown.

- These values are directly taken over by selecting Def - Min - Max. Alternatively, you can also set the value manually as described in chapter 4.11.



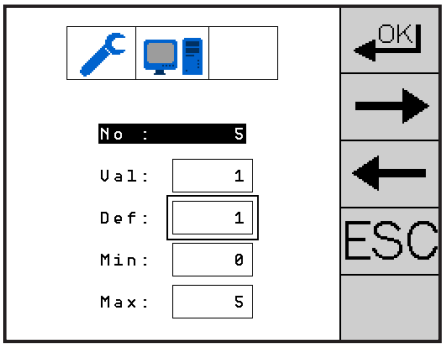
Picture 73:
Setting the values

No	Parameter
Def	Default value
Val	Set value
Min	Minimum value
Max	Maximum value

Table 1:
Abbreviations in the screen display

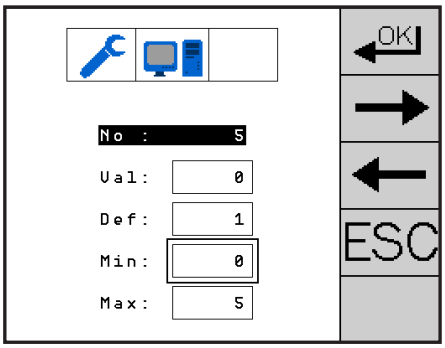
4.10.1. Acceptance of values

- Acceptance of default value



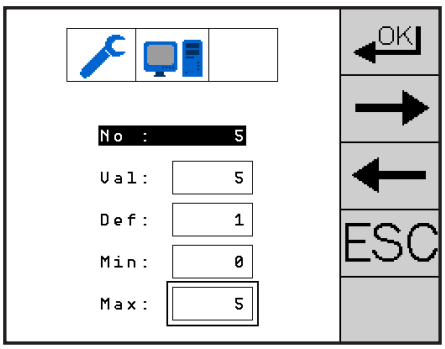
Picture 74:
Accept Def.

- Acceptance of minimum value



Picture 75:
Accept Min.

- Acceptance of maximum value

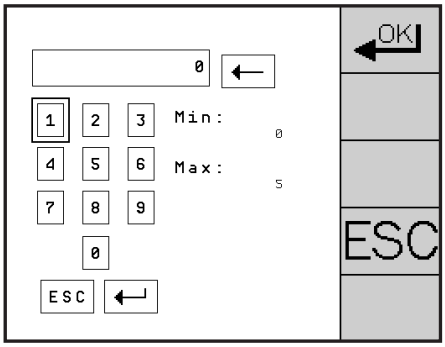


Picture 76:
Accept Max.

4.11. Numerical entry

Min and Max define the possible range of values. Enter the desired value and confirm by pressing  or the function key  .

Advice! Please refer to the user manual of the ISOBUS terminal for how to use and enter digits.



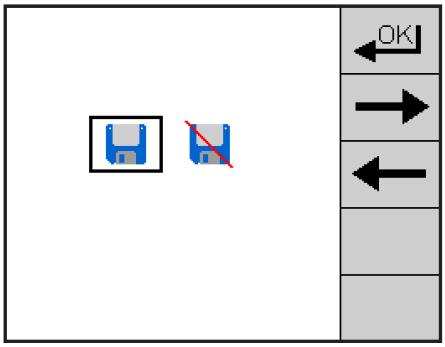
Picture 77:
Setting a value

4.12. Saving changes

After you make settings, you will be prompted to indicate whether you want to save your changes or not.

Select  and confirm the selection to save the changes.

Select  and confirm the selection to discard the changes.



Picture 78:
Save changes

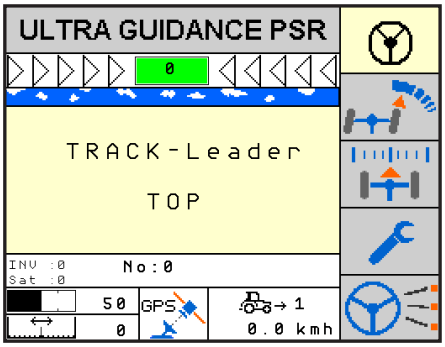
5. PSR SKY

PSR Sky is a satellite-only steering system that mainly faces without aisles and rows of plants is being used, for example to use in fertilization or tillage optimum device width.

In addition, you can switch available tracks. The following selections are available:

- Circles
- Multi-line
- A-B mode

Please refer to the TL-TOP operating manual for more information.



Picture 79:
Main screen

6. PSR SONIC

6.1. Overview Drive mode PSR SONIC

Ultra sound mode PSR ISO TOP SONIC offers the following drive modes:

Drive mode with two sensor pairs

Track Cross

Steering by a given track. This is the ideal drive mode for working fields, spraying or fertilizing.

Track Outside

Steering by better reconcilable outside edges of a track.

Swath Middle

Uses a swath of hay, straw or other a as guide reference.

Swath zig zag

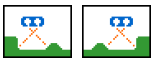
Uses a swath of hay, straw or other a as guide reference.

A load in a baler for example can become one-sided if the swath is small and fed at the same point into the machine. To keep that from happening the vehicle can be guided over the swath left to right and back again.

Drive Mode with one sensor pair

Crop Edge

Uses a crop edge as guide reference. It is possible to switch between crop edge left or right.



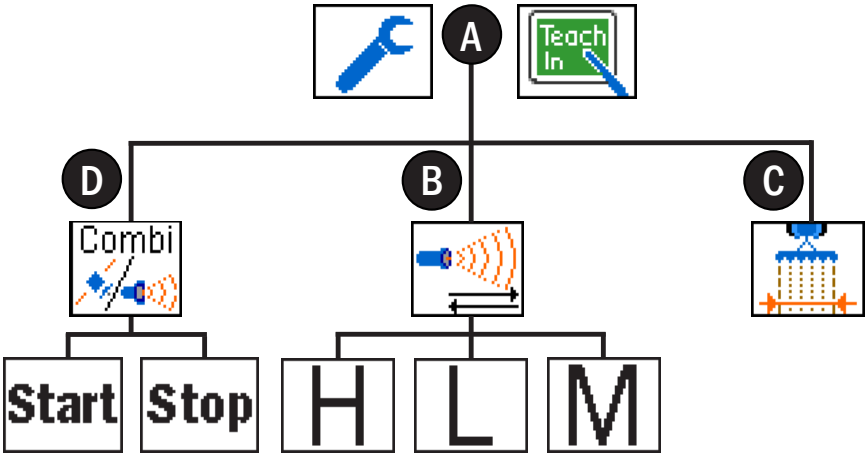
Crop Edge Cross wise

This drive mode is used when the reference line used is only on one side (example potato or asparagus).

Crop Edge with Correction

Crop edge guidance with height correction is used when working in hilly terrain to even out height differences.

6.2. Menu structure PSR SONIC



Picture 80:
Menu structure PSR SONIC

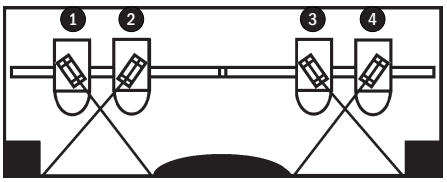
Ⓐ = Main Menu PSR SONIC
Ⓑ = Sample Spacing PSR SONIC
Ⓒ = Working width (When actively coupled)
Ⓓ = Combined PSR SONIC – PSR SKY

6.3. Adjusting Sensors

The Ultra sound sensors are supported by incrementally adjustable carrier arms. They are manually adjustable to a degree of +/- 75 of vertical.

The carrier arms are mounted to a main carrier frame and are easily adjustable to fit the track of the respective vehicle.

In order to change a sensor direction, loosen the nut on the back side of the sensor mount, reach under the cover and rotate the sensor to the desired direction. Make sure it matches one of the holes provided.



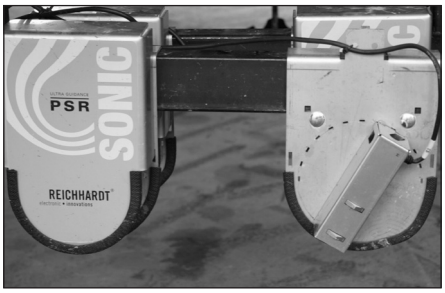
Picture 81:
Sensor positions

The sensor placement is dependent on the driving mode. Preferably we use the 3rd hole from the middle of the plate.

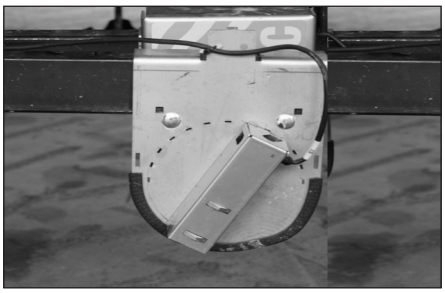
Advice! The sensor adjustment or distance from the object (crop edge or track angle) should be between 20 and 28 inches. To achieve this dimension we can slide the sensor sideways or raise/lower the carrier frame.

Attention! For trouble free operation, always keep the sensor pairs❶/❷ and ❸/❹ together. Also make sure the pairs on each side should be the same distance from the center of the vehicle.

All sensors should be set in the same hole on the mounting plate. Exception: When driving in the crop edge with correction mode. In that configuration the sensor ❷ and ❸ should point straight down.



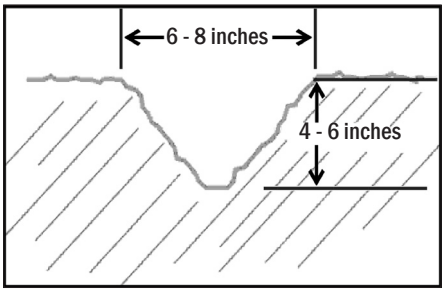
Picture 82:
Adjust sensor



Picture 83:
Adjust sensor

PSR SONIC sensors can recognize plants when about 4 inche tall.

When creating a marker track (furrow) make sure it looks similar to the sketch provided.

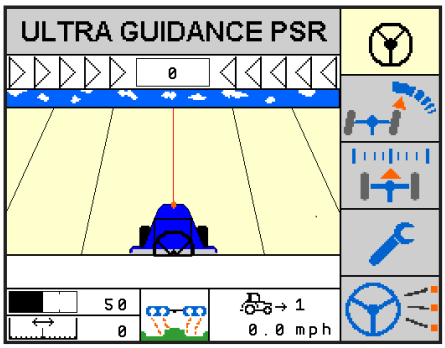


Picture 84:
Track shape

6.4. Main Menu PSR SONIC

Display: Main screen

Tap the function key  to change to the main menu PSR SONIC.

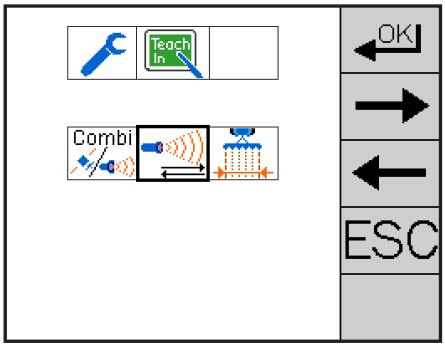


Picture 85:
Main Menu PSR SONIC

6.4.1. Sample Spacing SONIC

With the sample spacing of the SONIC sensors, the operator can adjust how aggressive the steering correction should be when a deviation from the intended line is recognized.

Choose  and confirm the selection.



Picture 86:
Setting of Sensor Sample Spacing

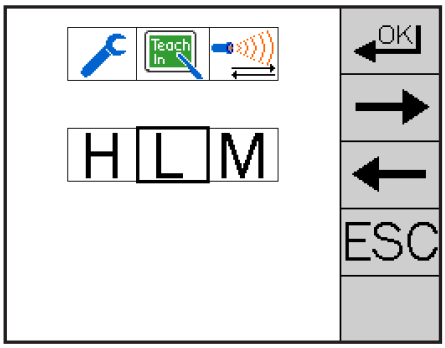
Advice! This setting is meant for all PSR SONIC drive modes.

Choose L or M or H uand press the function key  until the save screen shows. Proceed as described in chapter 4.12.

L = weak sample spacing. The vehicle reacts slower to a deviation.

M = normal sample spacing. The vehicle reacts normally to a deviation.

H = high sample spacing. The vehicle reacts even to the slightest deviations.



Picture 87:
Selection of sample spacing

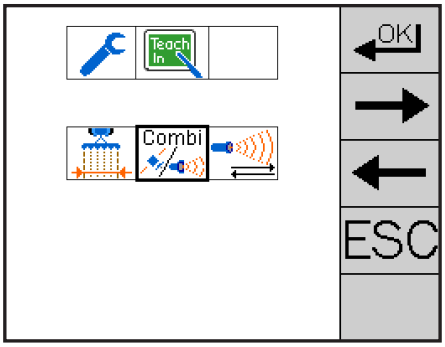
6.4.2. Joint use of PSR SONIC – PSR SKY

The combined use of PSR SONIC – PSR SKY helps when turning at the head land with entering into the next pass with PSR SKY.

In the field the work is done with PSR SONIC.

Advice! Additional information and function options are found in chapter 8.

Choose Combi and confirm the selection.



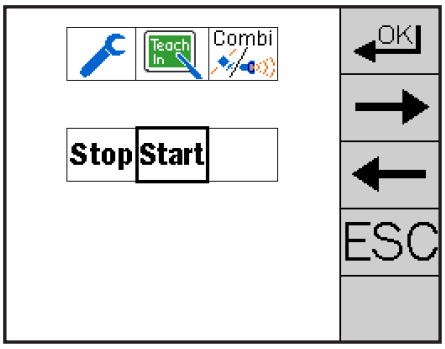
Picture 88:
Combined PSR SONIC – PSR SKY

Choose **Start** or **Stop** and press the function key OK until the save screen shows. Proceed as described in chapter 4.12.

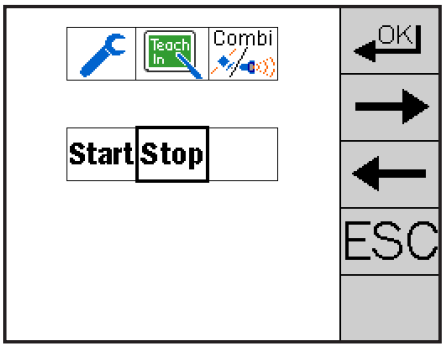
Start = Activate coupling.

Stop = Deactivate coupling.

Advice! The coupling for the actual PSR SONIC drive mode setting.



Picture 89:
Activate coupling



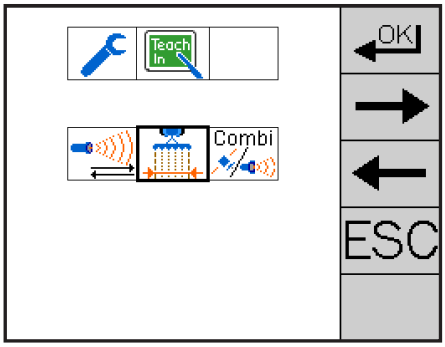
Picture 90:
Deactivate coupling

6.5. Set working width

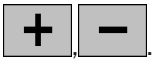
When the coupling is active the exact working width has to be set.

Contrary to PSR SKY it is not necessary to set a narrower working width.

Choose  and confirm the selection.

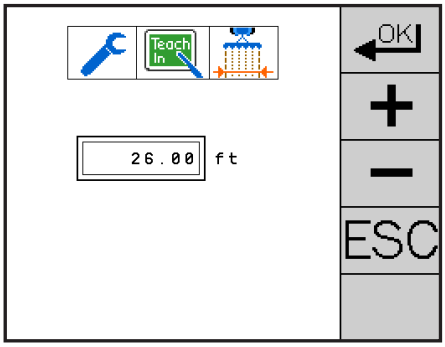


Picture 91:
Select setting of working width

Set the working width with the function keys  .

Press and hold the function key  until the stored symbol appears. Proceed as described in chapter 4.12.

Advice! A working width can only be set when the coupling is active during a current PSR SKY mode.



Picture 92:
Set working width

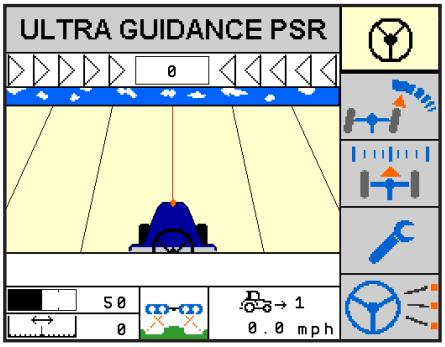
6.6. PSR SONIC drive modes

All drive mode pictures show the sensors placed as the driver will see them from the drivers seat in forward driving direction.

6.6.1. Track Cross

Display: Main screen

Set drive mode according to the adjoined picture (see chapter 4.5.).

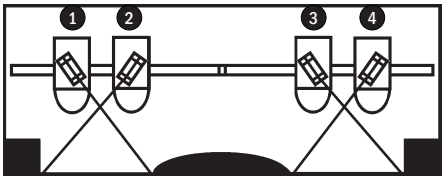


Picture 93:
Main Screen Track Cross

Advice! In the drive mode Track Cross a measurement shows a slight deviation to the left or right of the guide line.

Set sensors:

Set sensors according to adjacent picture. Pay attention that the measuring ray hits the inside of the edge to be read.



Picture 94:
Sensor Direction Track Cross

For setting the distance, use a tape measure.

Picture 95:
Main Screen Track Cross

Advice! Depending on the job, it might be advisable to install the sensors behind each other instead of side by side. In that situation, get a double reading of the same track which may improve accuracy. This might be workable when following a marker track when seeding.

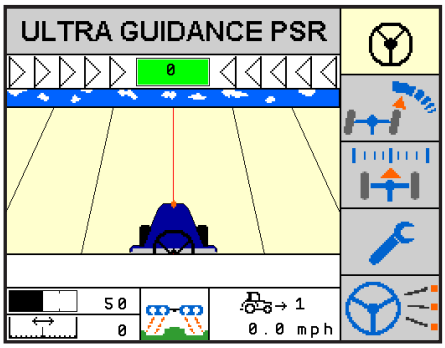
Picture 96:
Sensor placement behind one another

6.6.2. Track Outside

Display: Main screen

Set drive mode according to the adjoined picture (see chapter 4.5.).

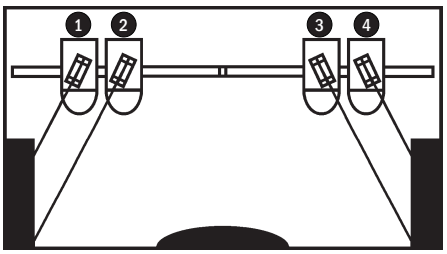
Advice! In the drive mode Track Outside the distance shows a slight deviation to left or right of the guide line.



Picture 97:
Main screen Track Outside

Set sensors:

Set sensors according to adjacent picture. Pay attention that the outside sensor hits the upper third of the edge and the inner sensor hits the lower third of the edge.



Picture 98:
Sensor direction drive mode Track Outside

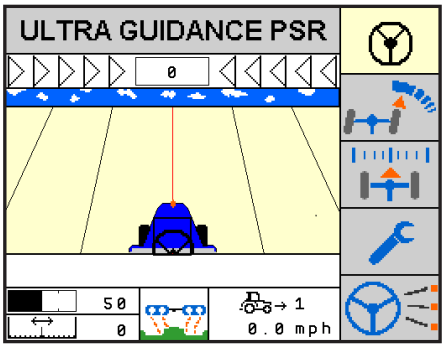
6.6.3. Swath Middle/Swath - zig zag

Display: Main screen

Set drive mode according to the adjoined picture (see chapter 4.5.).

Tap the function key  to switch between drive mode Swath Middle and Swath zig zag.

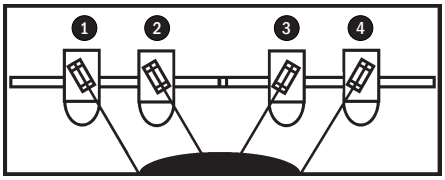
Advice! In the drive mode swath middle and swath zig zag, the distance shows a slight deviation to the left or right of the guide line.



Picture 99:
Main screen Swath Middle

Set sensors:

Set sensors according to adjacent picture. Direct the sensors in such a way that the outside sensors hit the swath on the bottom edge and the inside units hit the swath in the upper area.

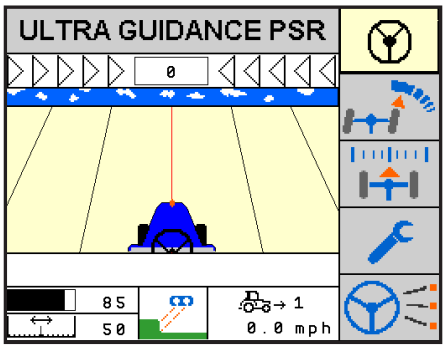


Picture 100:
Sensor direction Swath middle

6.6.4. Crop Edge

Display: Main screen

Set drive mode according to the adjoined picture (see chapter 4.5.).



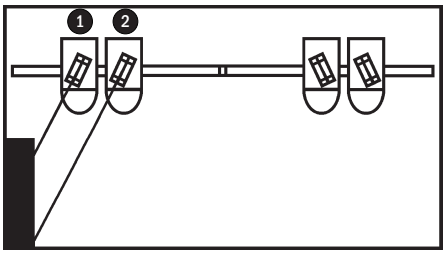
Picture 101:
Main Screen Crop Edge

Tap the function key  to switch between left and right crop edge.

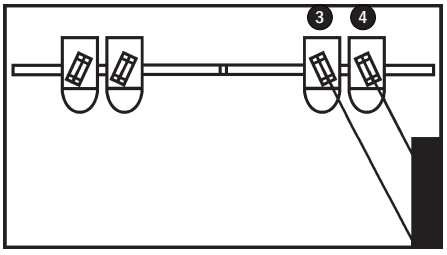
Advice! In the drive mode crop edge the distance shown is the medium distance between the left ❶/❷ or right ❸/❹ sensor pair to the crop edge.

Set sensors:

Set sensors according to adjacent pictures. Pay attention that the outer sensor hits the upper third and the inner sensor hits the lower third of the crop edge.



Picture 102:
Sensor direction left crop edge

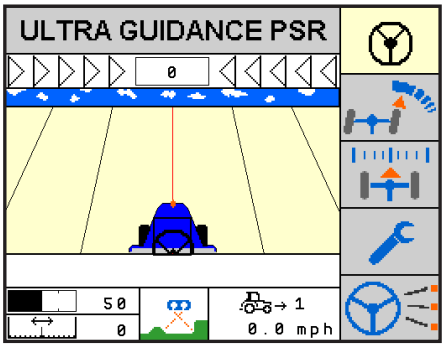


Picture 103:
Sensor direction right crop edge

6.6.5. Crop Edge cross wise

Display: Main screen

Set drive mode according to the adjoined picture (see chapter 4.5.).



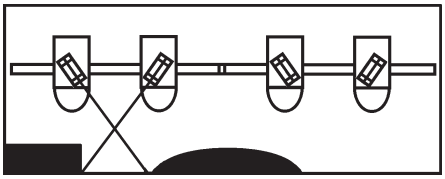
Picture 104:
Main Screen: crop edge cross wise right

Tap the function key  to switch between left and right crop edge cross wise.

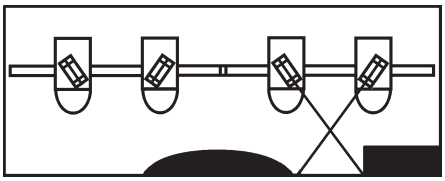
Advice! In the drive mode crop edge cross wise the distance shows a slight deviation left or right of the vehicle from the guide line.

Set sensors:

Set sensors according to adjacent pictures. Pay attention that the measure rays are directed to hit the inside of the corner.



Picture 105:
Sensor direction left edge cross

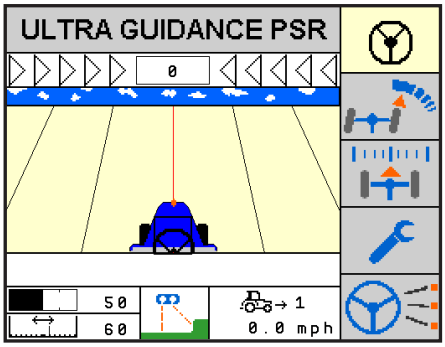


Picture 106:
Sensor direction right edge cross

6.6.6. Crop Edge with correction

Display: Main screen

Set drive mode according to the adjoined picture (see chapter 4.5.).



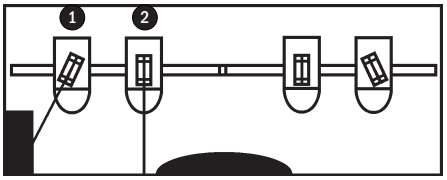
Picture 107:
Main Screen Crop edge with correction

Tap the function key  to switch between left and right crop edge with correction.

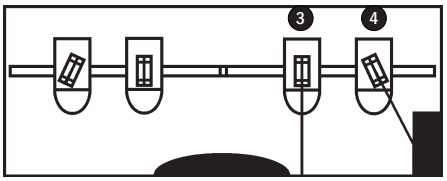
Advice! In the drive mode crop edge with correction the distance means measurement between the outer sensors ❶ or ❹ to the guide edge.

Set sensors:

Set sensors according to adjacent pictures. Pay attention that the measuring rays of the inner sensors ❷ and ❸ go straight down. The rays of the outer sensors ❶ and ❹ hit the middle of the upper crop edge.



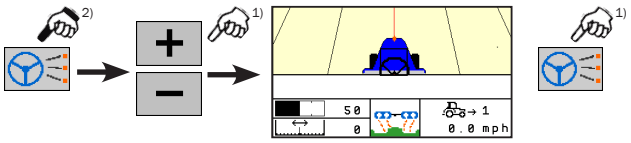
Picture 108:
Sensor direction edge right correction



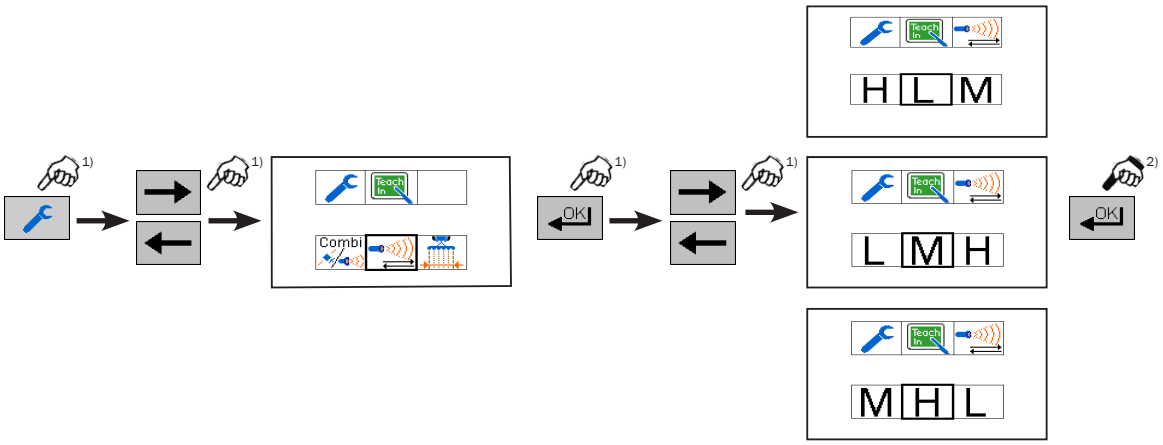
Picture 109:
Sensor direction edge leftcorrection

6.7. PSR Sonic Quick Start

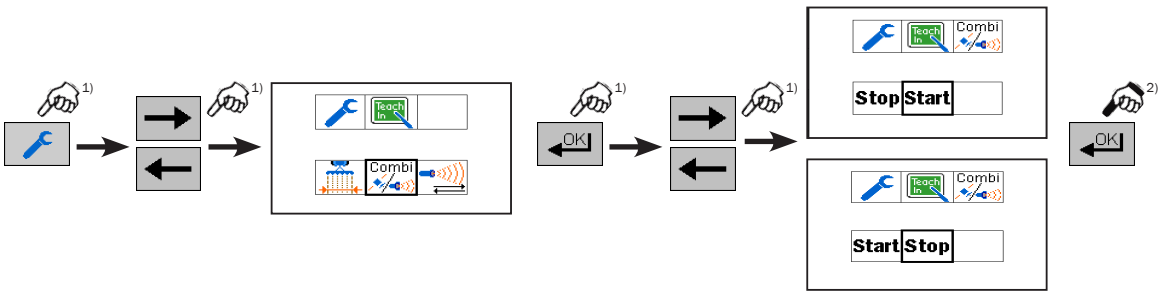
Select drive mode



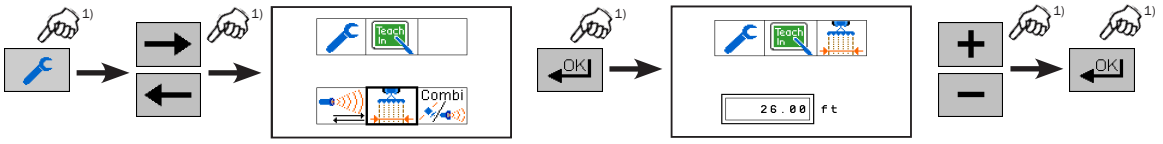
Set sample spacing



Switching PSR SONIC - PSR SKY on and off



Set working width



Legend: 1) Tap. 2) Press and hold, until there is reaction.

7. PSR TAC

7.1. Overview Drive mode PSR TAC

The mode PSR ISO TOP TAC offers the following drive modes:

TAC sensor

Steering on the basis of a closed row crop row (e.g. corn row)

Two TAC sensors, version “right”

Steering on the basis of a track with two row crop rows. Only the right TAC sensor is used as a guideline.

Two TAC sensors, version “left”

Steering on the basis of a track with two row crop rows. Only the left TAC sensor is used as a guideline.

Two TAC sensors, version “inside”

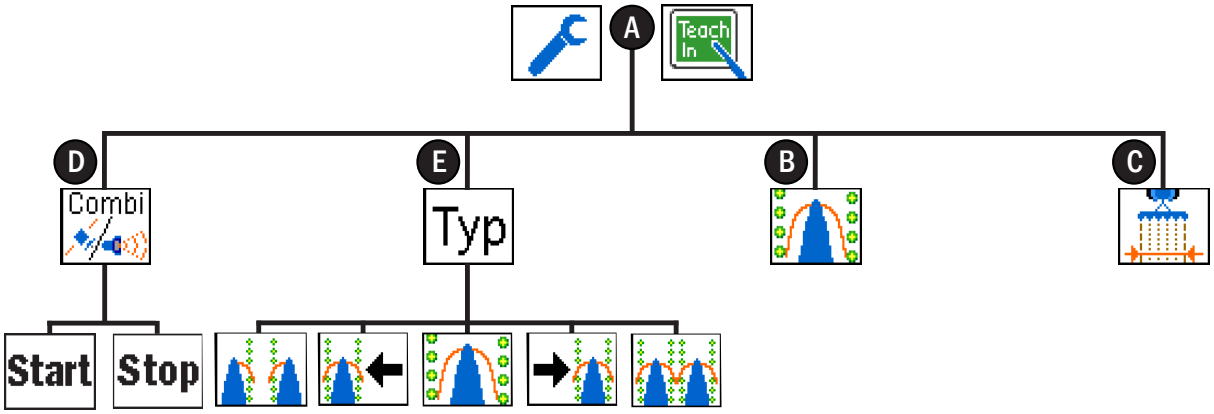
Steering on the basis of any two row crop rows with one-side scanning on the inside.

Two TAC sensors

Uses two row crop rows as a guide.

In case of gaps in the crop, the second TAC sensor can be used to achieve improved driving performance.

7.2. Menu structure PSR TAC



Picture 110:
Menu structure PSR TAC

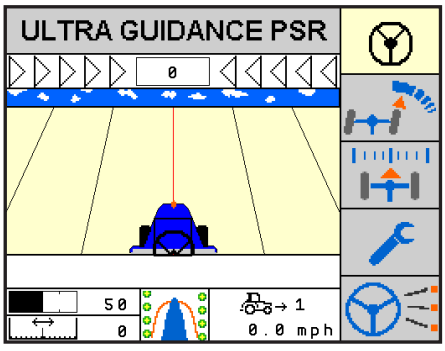
Ⓐ = Main menu PSR TAC
Ⓑ = TAC sensor calibration
Ⓒ = Set working width
Ⓓ = Joint use of PSR TAC – PSR SKY
Ⓔ = Types of TAC sensors

7.3. Main screen PSR TAC

Display: Main screen

Set drive mode according to the adjoined picture.

Advice! In drive mode PSR TAC the distance shows a slight deviation of the vehicle to the left or right of the guide line.

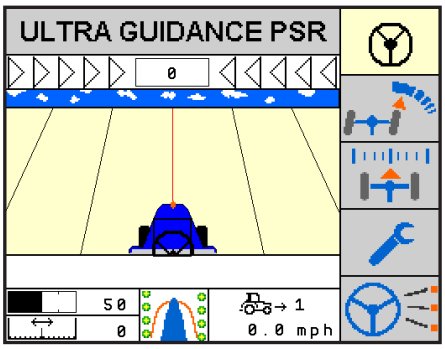


Picture 111:
Main screen PSR TAC

7.4. Main menu PSR TAC

Display: Main screen

Tap the function key  to change to the main menu PSR TAC.



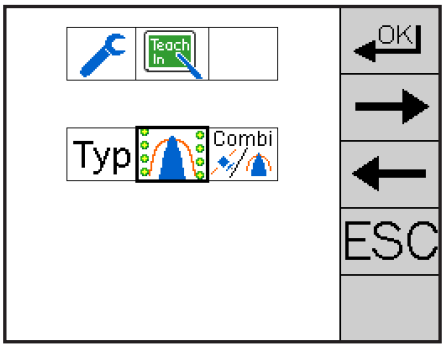
Picture 112:
Main screen PSR TAC

7.4.1. TAC sensor calibration

Choose  and confirm the selection.

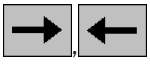
To get consistently good results with the TAC sensor, it is advised re-calibrate it occasionally. Especially during initial use or after lengthy periods of no use.

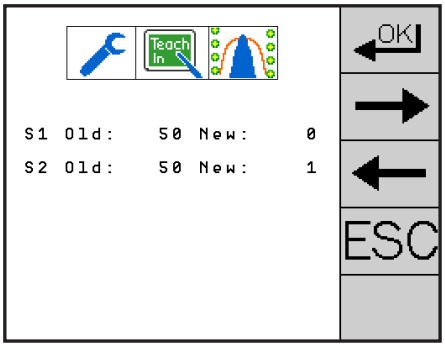
Make sure the plastic wand is in rest position. It should not touch anything or be moved by any action. Do not touch the sensor. The value should be between 40 and 70.



Picture 113:
Select TAC sensor

Press and hold the function key  until the stored symbol appears. Proceed as described in chapter 4.12.

Advice! For more consistent results, the vehicle may have two sets of sensors. When pressing the function keys  the operator will first see S1 then S2 then S3 and S4. All sensors will be calibrated together.

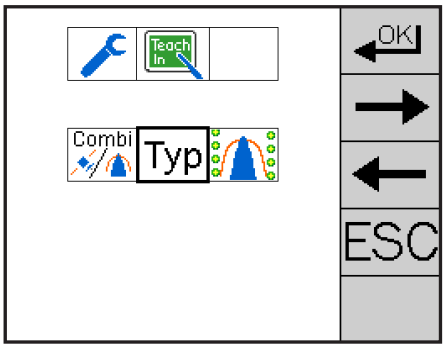


Picture 114:
Calibrate TAC sensor

7.4.2. Select two TAC sensors

Using the TAC sensors, you can gently and precisely detect vegetation in closed row crops (e.g. corn) and steer the vehicle with maximum precision.

Choose Typ and confirm the selection.



Picture 115:
Select type

Press the function keys → , ← to select a method.

Press and hold the function key OK until the stored symbol appears. Then proceed as described in chapter 4.12.

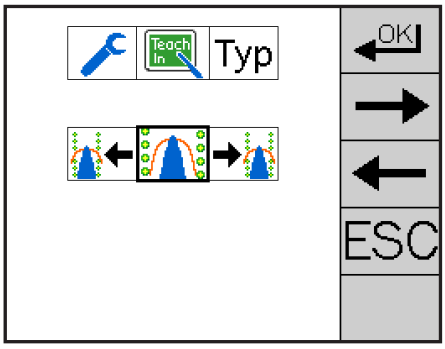
 = TAC sensor

 = Two TAC sensors, version “right”

 = Two TAC sensors, version “left”

 = Two TAC sensors, version “inside”

 = Two TAC sensors



Picture 116:
Select TAC sensor

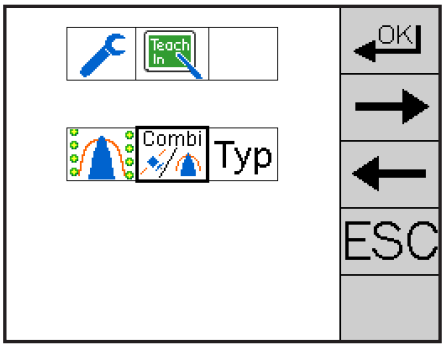
7.4.3. Joint use of PSR TAC – PSR SKY

Coupling of PSR TAC – PSR SKY allows for quick and clean reentering of a new pass after turning on the headland with PSR SKY.

In the field, the work is done with the drive mode PSR TAC.

Advice! Additional information and function options are found in chapter 8.

Choose Combi and confirm the selection.



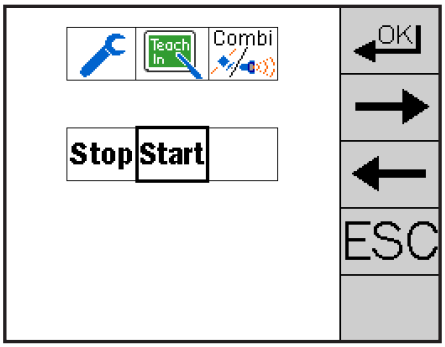
Picture 117:
Coupling of PSR TAC - PSR SKY

Choose **Start** or **Stop** and press the function key OK

until the save screen shows. Proceed as described in chapter 4.12.

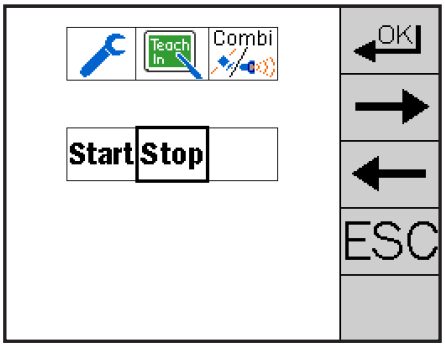
Start = Activate coupling.

Stop = Deactivate coupling.



Picture 118:
Activate coupling

Advice! The coupling for the actual PSR TAC drive mode setting.



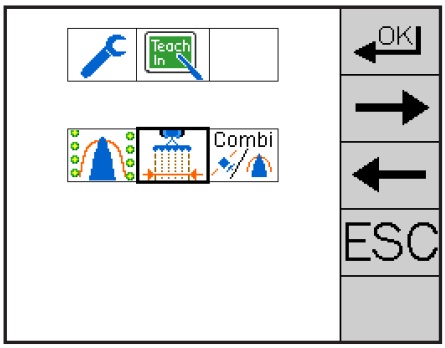
Picture 119:
Deactivate coupling

7.5. Set working width

When the coupling is active the exact working width has to be set.

Contrary to PSR SKY it is not necessary to set a narrower working width.

Choose  and confirm the selection.

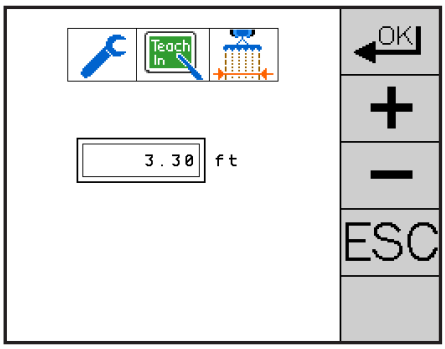


Picture 120:
Select setting of working width

Set the working width with the function keys [+], [−].

Press and hold the function key [OK] until the stored symbol appears. Proceed as described in chapter 4.12.

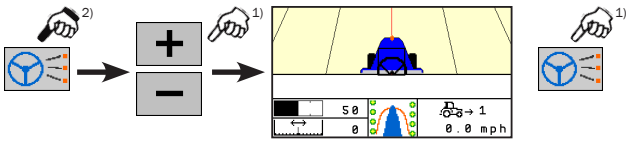
Advice! A working width can only be set when the coupling is active during a current PSR TAC mode.



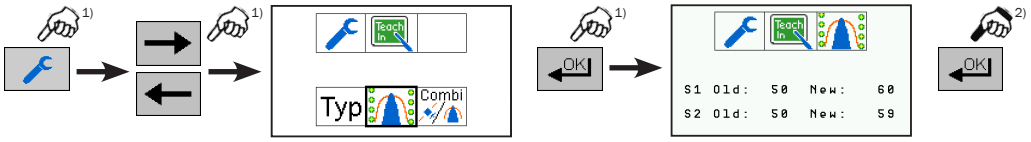
Picture 121:
Set working width

7.6. PSR TAC Quick Start

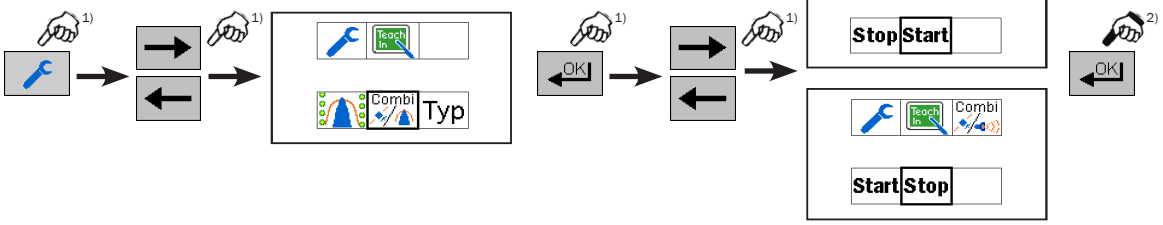
Select drive mode



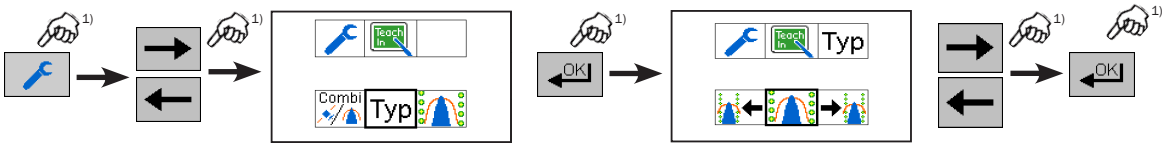
Calibrate TAC sensor



Switching coupling PSR TAC - PSR SKY on and off



Select TAC sensor



Legend: 1) Tap. 2) Press and hold, until there is reaction.

8. Coupling of drive modes

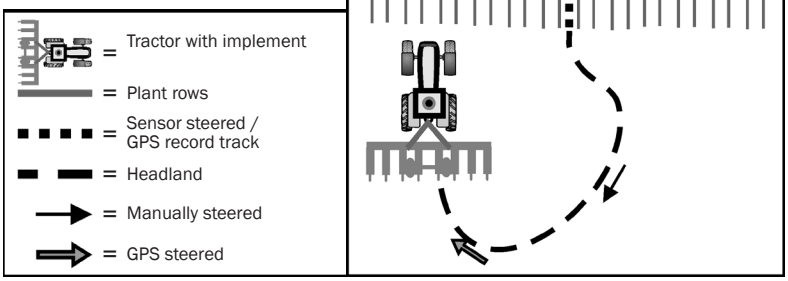
The combined use of sensor drive mode and PSR SKY allows for easy and clean reentering after turning on the headland.

The sensor operation is preferred while working the field, but when turning at the end, PSR SKY guides the vehicle into the new pass accurately without time loss.

Example: Spraying corn with TAC: After turning at the end of the row, PSR SKY takes over the entering into the next pass, without any row count or advance marking.

The coupling can be turned on/off in any sensor drive mode.

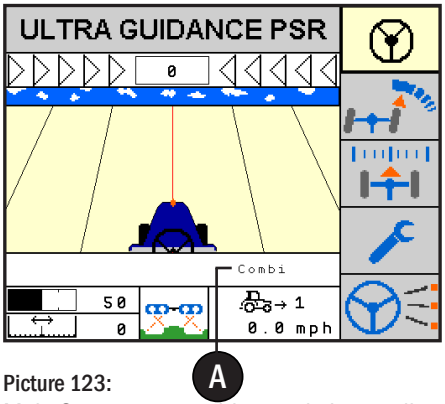
Advice! When the coupling is activated, switching between automatic drive mode and steering by wire is not possible.



Picture 122:
Combined navigation with the help of GPS and Sensors

Display: Main screen

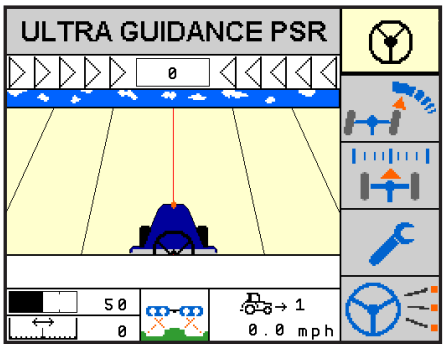
The information field Ⓐ is shown as “Combi”, meaning the coupling is activated.



Picture 123:
Main Screen sensor drive mode in coupling mode

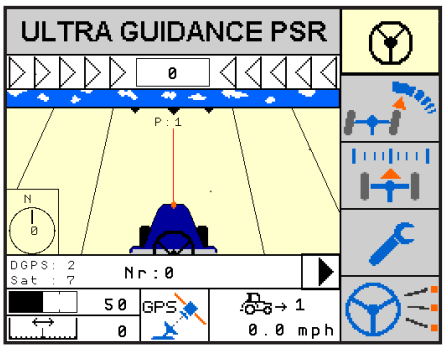
Semi automatic switching between sensor drive mode PSR SKY

Drive through the field in the sensor drive mode. When the vehicle reaches the end of the field, de-activate the sensor mode by gripping the steering wheel to begin the turn around process.



Picture 124:
Main Screen sensor drive mode in coupling mode

As soon as the vehicle gets near the entrance of the next pass, the system will automatically switch to PSR SKY mode. An audible sound can be heard. This is the queue to activate PSR ISO TOP, and the system takes over the re-enter phase.

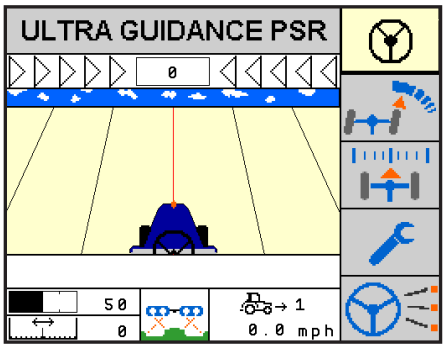


Picture 125:
Main Screen after switching to PSR SKY

Advice! If the vehicle does not enter the next pass within 45 seconds, after deactivating the PSR ISO TOP, an automatic switch to PSR SKY will not happen.

To free the system of automatic switching, travel with PSR ISO TOP activated at least a stretch of 98 ft in a sensor mode.

As soon as the vehicle finds itself in a new pass, the system switches back to the sensor mode from before the turn.

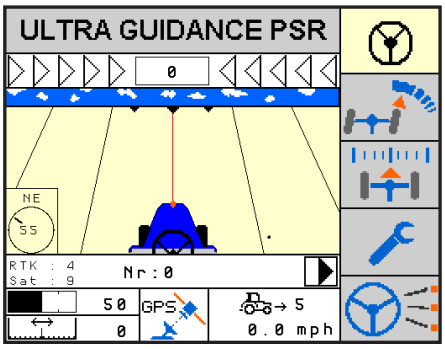


Picture 126:
Main Screen after switching to Sensor drive mode

Advice! After switching to drive mode PSR SKY, and the steering is not activated within 25 seconds, the drive mode switches automatically back to the previously set sensor mode.

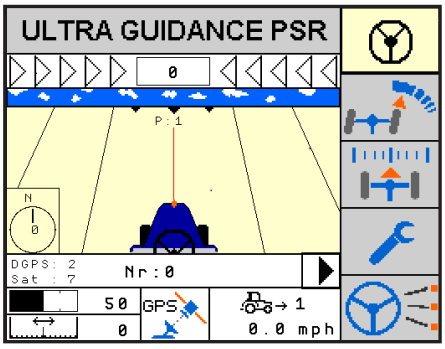
Manual switching between sensor drive mode PSR SKY

In certain situations it is advantageous when drive mode PSR SKY is manually checked and held. In case there is an actual obstacle on the head land (power pole etc.) or a tank refill is needed, it will be helpful find the next pass automatically.



Picture 127:
Main Screen sensor drive mode in coupling mode

Tap the function key  to switch from sensor drive mode to PSR SKY mode.

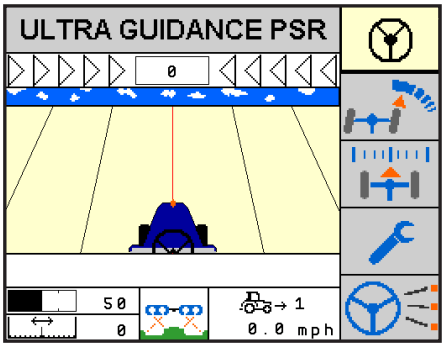


Picture 128:
Main Screen after switching to PSR SKY

Advice! After manually using PSR SKY, the switch back to sensor mode has to be done manually also. It will **not** happen automatically.

To free the system of automatic switching, travel with PSR ISO TOP activated at least a stretch of 98 ft in a sensor mode.

Tap the function key  to switch from PSR SKY to the sensor drive mode.



Picture 129:
Main Screen after switching to Sensor drive mode

Advice! A manual switch of the PSR SKY mode into the previous sensor drive mode has no influence on the automatic switching.

9. Work and Storage Conditions

The electronic components of the PSR ISO TOP system, especially the PSR iBox, are designed to be used in adverse conditions. PSR iBox is weather resistant and can be installed outside of the drivers cab.

Advice! Never use a pressure washer on the PSR iBox or any of the harness connections. A wet cloth is recommended.

To extend life expectancy, store components of iBasic which are not permanently installed on the vehicle. Keep all hardware with the components, and store in a proper location. Avoid humidity, moisture, and locations with high temperatures. Avoid storing near windows, heaters, motors or venting systems. Avoid windows with direct sunlight.

10. Troubleshooting

Error-No.:	Description	Cause	Troubleshooting
GPS no Receiver	No GPS receiver connected.	- Open wire between GPS-receiver and PSR iBox.	- Check cables from PSR iBox to GPS-receiver.
		- Fuse B6.1 or B6.2 defective.	- Check fuses in PSR iBox.
			- Check which signals from the GPS receiver should be evaluated (NMEA 0183, NMEA 2000, J1939 GPS).
No GPS signal	No reception of GPS signals.	- Wrong wires are connected.	- Check whether correct serial port is connected.
		- Wrong baud rate.	- Check settings of GPS-receiver.
GPS Warm Up Please Wait	Reception of GPS signals, but they have to be checked.	- GPS receiver has not yet started correctly.	- Wait until GPS receiver has started correctly.
			- Drive to a place where you have open view to the sky.
Low GPS-Signal	Poor reception of GPS signals.	- No free view to the sky.	- Drive to a place where you have open view to the sky.
		- Objects (trees, houses etc.) disturb the reception.	
GPS no A-B-line	No A-B line saved under this job no.	- No A-B line saved under this job no.	- Save a new A-B line under current job number.
			- Select another job number, where an A-B line is saved.
Distance to A too far away	Saved A-B line is too far away.	- Saved A-B line too far away.	- Save new A-B line.
			- If this A-B line is to be driven, the vehicle must be moved closer to the position at which the A-B line was saved.
Too many GPS Lines	Position outside range.	- The system can register +- 10000 lines.	- Save new A-B line.
			- Drive to range of +- 10000 lines.
GPS no RMC	No GPRMC message received from GPS receiver.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.
GPS no GGA	No GPGGA message received from GPS receiver.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.
GPS no VTG	No GPVTG message received from GPS receiver.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.
GPS J1939 No VP	No J1939 VP message received from GPS receiver.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.
GPS J1939 No VDS	No J1939 VDS message received from GPS receiver.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.

Error-No.:	Description	Cause	Troubleshooting
NMEA 2000 No RDU	No NMEA 2000 RDU message received from GPS receiver.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.
NMEA 2000 No CSD	No NMEA 2000 CSD message received from GPS receiver.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.
NMEA 2000 No PD	No NMEA 2000 PD message received from GPS receiver.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.
Lost RTK	Loss of RTK quality in GPS receiver.	- GPS receiver receiving a lower quality than RTK.	- Check reference age of base station.
Lost DGPS	Loss of DGPS quality in GPS receiver.	- GPS receiver receiving a lower quality than DGPS .	- Check reference age from correction satellite.
GPS update rate too slow	GPS receiver sends insufficient # of messages per second.	- GPS receiver incorrectly configured.	- The GPS receiver must be reconfigured.
Terminal Version	Terminal version is too old.	- After Software update from PSR iBox, it may be necessary to transfer a new version to the PSR cBox.	- Update the PSR cBox with the version shown on the display.
PSR no license	Invalid Hardware.	- The used hardware is not compatible for this software.	- Contact your Reichhardt support.
Select Steering mode	No drive mode selected.	- No drive mode selected yet.	- Please select a drive mode.
		- The time for a certain drive mode has expired.	- Contact your Reichhardt support.
New license not possible	No additional scheduled activation of a drive mode can be made.	- This drive mode has already been activated 3 times.	- Contact your Reichhardt support.
Timeout license end	The time for a certain drive mode has expired.	- The scheduled activation has expired.	- Contact your Reichhardt support.
Last shut down bad	An error occurred during the last shutdown.	- The battery is not connected properly.	- Check to see if the battery is connected.
		- A software error has occurred.	- Contact your Reichhardt support.
1000	No signal from the wheel angle sensor.	- Short circuit in cable.	- Check the plug-in connections of the wheel angle sensor.
		- Open wire in cable.	- Check the cables from PSR iBox to the wheel angle sensor.
		- Sensor is defective.	- If all connections and lines are in proper working order, replace the wheel angle sensor.
		- Contacts of connectors are opened.	- Check contacts of connectors.

Error-No.:	Description	Cause	Troubleshooting
1001	Angle sensor does not work correctly.	- Axis is driven to block.	- Check mechanism of wheel angle sensor.
		- Mechanism or suspension of wheel angle sensor defective.	- For new angle sensors, the sensor has to be calibrated through the “teach-in” page.
		- A new wheel angle sensor was built in wrong.	
		- An obstacle prevents the movement of the axis.	
1010	Wheel angle sensor not in valid range	- Mechanism is defective.	- Check sensor mounting.
		- Open wire in cable.	- Check the cables from PSR iBox to the wheel angle sensor.
		- Sensor is defective.	- Check sensor.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1019	Left and right angle sensors running apart.	- Wheels run too far apart.	- Turn wheels from full left to full right.
		- Open wire in cable.	- Check the cables from PSR iBox to the wheel angle sensor.
		- Sensor is defective.	- Check sensor.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1020	Cabin door is open.	- Cabin door is open.	- Close cabin door.
		- Open wire in cable.	- Check the cables from PSR iBox to door switches.
		- Door switches are defective.	- Check door switches.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1040	Pressure sensor open wire.	- Pressure sensor is defective.	- Visual control of pressure sensor.
		- Open wire in cable.	- Check the cables from PSR iBox to the pressure sensor.
		- Bolted connection of pressure sensor is not correct.	- Check bolted connection of pressure sensor.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1041	Pressure sensor short circuit.	- Pressure sensor is defective.	- Visual control of pressure sensor.
		- Short circuit in cable.	- Check the cables from PSR iBox to the pressure sensor.
		- Bolted connection of pressure sensor is not correct.	- Check bolted connection of pressure sensor.
		- Contacts of connectors are closed.	- Check contacts of connectors.

Error-No.:	Description	Cause	Troubleshooting
1080	Gyroscope open wire.	- Gyroscope is defective.	- Visual control of gyroscope.
		- Open wire in cable.	- Check the cables from PSR iBox to the gyroscope.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1081	Gyroscope short circuit.	- Gyroscope is defective.	- Visual control of gyroscope.
		- Short circuit in cable.	- Check the cables from PSR iBox to the gyroscope.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1082	Gyroscope no reaction.	- Gyroscope is defective.	- Visual control of gyroscope.
			- Check the cables from PSR iBox to the gyroscope.
			- Check contacts of connectors.
			- Check analog value in diagnostic menu.
1084	Gyroscope value not in valid range.	- Too sharp a turn with too high speed.	- See 1082.
			- Reduce speed.
			- Make wider turn.
1085	Gyroscope average value is out of range.	- Speed signal is defective.	- See 1082.
		- Gyroscope is defective.	
1086	Constant speed is not allowed together with gyroscope.	- Constant speed is set in the system.	- Manual speed entry needs to be adjusted by a service technician.
1100	TAC sensor left open wire.	- TAC sensor is defective.	- Visual control of TAC sensor.
		- Open wire in cable.	- Check the cables from PSR iBox to the TAC sensor.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1101	TAC sensor left short circuit.	- TAC sensor is defective.	- Visual control of TAC sensor.
		- Short circuit in cable.	- Check the cables from PSR iBox to the TAC sensor.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1102	TAC sensor right open wire.	- TAC sensor is defective.	- Visual control of TAC sensor.
		- Open wire in cable.	- Check the cables from PSR iBox to the TAC sensor.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1103	TAC sensor right short circuit.	- TAC sensor is defective.	- Visual control of TAC sensor.
		- Short circuit in cable.	- Check the cables from PSR iBox to the TAC sensor.
		- Contacts of connectors are closed.	- Check contacts of connectors.

Fehler-Nr.:	Description	Cause	Troubleshooting
1104	TAC sensor 2 left open wire.	- TAC sensor is defective.	- Visual control of TAC sensor.
		- Open wire in cable.	- Check the cables from PSR iBox to the TAC sensor.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1105	TAC sensor 2 left short circuit.	- TAC sensor is defective.	- Visual control of TAC sensor.
		- Short circuit in cable.	- Check the cables from PSR iBox to the TAC sensor.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1106	TAC sensor 2 right open wires.	- TAC sensor is defective.	- Visual control of TAC sensor.
		- Open wire in cable.	- check the cables from PSR iBox to the TAC sensor.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1107	TAC sensor 2 right short circuit.	- TAC sensor is defective.	- Visual control of TAC sensor.
		- Short circuit in cable.	- Check the cables from PSR iBox to the TAC sensor.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1150	Rowfeeler open wire.	- Rowfeeler is defective.	- Visual control of rowfeeler.
		- Open wire in cable.	- Check cables from PSR iBox to rowfeeler.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1151	Rowfeeler short circuit.	- Rowfeeler is defective.	- Visual control of rowfeeler.
		- Short circuit in cable.	- Check cables from PSR iBox to rowfeeler.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1200	Camera no reaction.	- Camera is defective.	- Visual control of camera.
		- Open wire in cable.	- Check cables from PSR iBox to camera.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1210	No signal from camera while operating.	- Camera is defective.	- Visual control of camera.
		- Open wire in cable.	- Check cables from PSR iBox to camera.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1220	No valid signals from camera.	- Adjustment of camera is incorrect.	- Check mounting of the camera.
		- Distance between camera and plants is too small.	- Check parameters/adjustments of the camera.
		- There's excess vegetation between plantrows.	- Clean camera lens.
			- Use additional lighting when ambient lighting is poor.

Error-No.:	Description	Cause	Troubleshooting
1350	Speed is too fast.	- Vehicle speed is too fast.	- Reduce speed and activate system again.
1351	No ISO-GBSD message received.	- Tractor ECU does not support the ISO speed message.	- Select another speed sensor.
1352	No ISO-WBSD message received.	- Tractor ECU does not support this ISO speed message.	- Select another speed sensor.
1353	No valid message on ISO speed received.	- Tractor ECU sending invalid speed data.	- Select another speed sensor.
1400	Ultra sonic 1 open wire.	- Ultra sonic 1 is defective.	- Visual control of ultra sonic 1.
		- Open wire in cable.	- Check the cables from PSR iBox to ultra sonic 1.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1401	Ultra sonic 2 open wire.	- Ultra sonic 2 is defective.	- Visual control of ultra sonic 2.
		- Open wire in cable.	- Check the cables from PSR iBox to ultra sonic 2.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1402	Ultra sonic 3 open wire.	- Ultra sonic 3 is defective.	- Visual control of ultra sonic 3.
		- Open wire in cable.	- Check the cables from PSR iBox to ultra sonic 3.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1403	Ultra sonic 4 open wire.	- Ultra sonic 4 is defective.	- Visual control of ultra sonic 4.
		- Open wire in cable.	- Check the cables from PSR iBox to ultra sonic 4.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1404	All ultra sonic open wire.	- Connector is disconnected from the front plug box.	- Visual control of all ultra sonics.
		- Open wire at ground or start signal.	- Check the cables of the PSR iBox to all ultra sonic.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1410	Ultra sonic 1 no signal.	- Object outside detection area.	- Visual control of ultra sonic 1.
			- Check sensor position.
1411	Ultra sonic 2 no signal.	- Object outside detection area.	- Visual control of ultra sonic 2.
			- Check sensor position.
1412	Ultra sonic 3 no signal.	- Object outside detection area.	- Visual control of ultra sonic 3.
			- Check sensor position.

Error-No.:	Description	Cause	Troubleshooting
1413	Ultra sonic 4 no signal.	- Object outside detection area.	- Visual control of ultra sonic 4.
			- Check sensor position.
1414	All ultra sonic no signal.	- Object outside detection area of all sensors.	- Check sensor positions.
1500	Lock valve left open wire.	- Lock valve is defective.	- Visual control of lock valve.
		- Open wire in cable.	- Check the cables from PSR iBox to the lock valve.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1501	Lock valve left short circuit.	- Lock valve is defective.	- Visual control of lock valve.
		- Short circuit in cable.	- Check the cables from PSR iBox to the lock valve.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1502	Lock valve right open wire.	- Lock valve is defective.	- visual control of lock valve.
		- open wire in cable.	- check the cables from PSR iBox to the lock valve.
		- contacts of connectors are opened.	- check contacts of connectors.
1503	Lock valve right short circuit.	- Lock valve is defective.	- Visual control of lock valve.
		- Short circuit in cable.	- Check the cables from PSR iBox to the lock valve.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1550	Steer valve left open wire.	- Steer valve is defective.	- Visual control of steer valve.
		- Open wire in cable.	- Check cables from PSR iBox to steer valve.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1551	Steer valve left short circuit.	- Steer valve is defective.	- Visual control of steer valve.
		- Short circuit in cable.	- Check cables from PSR iBox to steer valve.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1552	Steer valve right open wire.	- Steer valve is defective.	- Visual control of steer valve.
		- Open wire in cable.	- Check cables from PSR iBox to steer valve.
		- Contacts of connectors are opened.	- Check contacts of connectors.
1553	Steer valve right short circuit.	- Steer valve is defective.	- Visual control of steer valve.
		- Short circuit in cable.	- Check cables from PSR iBox to steer valve.
		- Contacts of connectors are closed.	- Check contacts of connectors.
1700	Front plug no voltage.	- Outlet at the PSR iBox is defective.	- Check cables from PSR iBox to front plug box.
		- Short circuit in cable.	

Error-No.:	Description	Cause	Troubleshooting
1701	Start signal ultra sonic no voltage.	- Outlet at the PSR iBox is defective.	- Check cables from PSR iBox to front plug box.
		- Short circuit in cable.	
1702	GPS no voltage.	- Outlet at the PSR iBox is defective.	- Check cables from PSR iBox to GPS-receiver.
		- Short circuit in cable.	
1703	Sensors no voltage.	- Outlet at the PSR iBox is defective.	- Check the cables from PSR iBox to all sensors.
		- Short circuit in cable.	
1710	No voltage relay input-side.	- Fuse defective.	- Check fuses in PSR iBox and supply lines.
		- Supply voltage for outlets not yet switched on.	- Check whether supply voltages are switched on.
1711	No voltage relay output-side.	- Relay in iBox Lt is defective.	- Contact your Reichhardt support.
2100	Incremental axle.	- no pulse signal at channel A.	- Check cables from PSR iBox to incremental sensor (for example: RDU).
2101	Incremental axle.	- no pulse signal at channel B.	- Check cables from PSR iBox to incremental sensor (for example: RDU).
2102	Incremental axle.	- no pulse signal at channel A and B.	- Check cables from PSR iBox to incremental sensor (for example: RDU).
2150	John Deere Autotrac.	- No communication.	- Check cables from PSR iBox to JD Autotrac Motor.
2200	Footswitch defective.	- Footswitch engaged too long.	- Check footswitch.
		- Short circuit in cable.	- Check the cables of the PSR iBox to footswitch.
		- Footswitch defective.	
2300	ISO Cat hydraulic main switch off.	- The hydraulics are disengaged by switch.	- Check hydraulic switch.
2301	ISO Cat communication error.	- Poor CAN connection.	- Check cables from PSR iBox to CAT CAN-Bus.
		- Activate ISO implementation level 3 on the CAT screen.	- Activate ISO level 3 on the CAT screen.
2310	ISO Fendt communication error Can Bus 1.	- no information from Can Bus received.	- Contact your Reichhardt support.
2311	ISO Fendt communication error Can Bus 2.	- No information from Can Bus received.	- Contact your Reichhardt support.
2315	ISO AGCO combine harvester communication error Can Bus 1.	- no information from Can Bus received.	- Contact your Reichhardt support.
2316	ISO AGCO combine harvester communication error Can Bus 2.	- No information from Can Bus received.	- Contact your Reichhardt support.
2317	ISO AgriFac communication error.	- No information from Can Bus received.	- Contact your Reichhardt support.

Error-No.:	Description	Cause	Troubleshooting
2320	ISO Challenger tractor MT 675 C communication error Can Bus 1.	- Steering disengaged by the switch.	- Check whether steering has been activated.
2321	ISO Challenger tractor MT 675 C communication error Can Bus 2.	- No information from Can Bus received.	- Contact your Reichhardt support.
2325	ISO Challenger tractor 900 C communication error.	- No information from Challenger 900 C received.	- Contact your Reichhardt support.
2330	CLAAS XERION communication error.	- No information from XERION received.	- Check cables between PSR iBox and the connection of second CAN bus.
2335	CLAAS LEXION communication error.	- No information from LEXION received.	- Check cables between PSR iBox and the connection of second CAN bus.
2340	Krone Big X / Big M communication error.	- No connection established to Krone Steering Controller.	- Contact your Reichhardt support.
2350	CAN BUS 2 communication error.	- Poor CAN connection.	- Check cables between PSR iBox and the connection of second CAN bus.
2400	Tilt sensor open wire.	- Sensor is defective. - Open wire in cable. - Contacts of connectors are opened.	- Check the cables from PSR iBox to the tilt sensor.
2401	Tilt sensor short circuit.	- Sensor is defective. - Short circuit in cable. - Contacts of connectors are closed.	- Check the cables from PSR iBox to the tilt sensor.
2402	Tilt sensor not connected.	- Sensor is defective. - Open wire in cable. - Contacts of connectors are opened.	- Check the cables from PSR iBox to the tilt sensor.
2403	Tilt sensor no reaction.	- Sensor is defective. - Open wire in cable. - Contacts of connectors are opened.	- Check the cables from PSR iBox to the tilt sensor.
2410	Not activated by Krone.	- Steering via terminal or footswitch activated.	- Must be activated via the joystick.
3001	Vehicle code for vehicle 1 invalid.	- Invalid or not yet valid vehicle code entered.	- Enter a valid vehicle code for vehicle 1.
3002	Vehicle code for vehicle 2 invalid.	- Invalid or not yet valid vehicle code entered.	- Enter a valid vehicle code for vehicle 2.
3003	Vehicle code for vehicle 3 invalid.	- Invalid or not yet valid vehicle code entered.	- Enter a valid vehicle code for vehicle 3.

Error-No.:	Description	Cause	Troubleshooting
3004	Vehicle code for vehicle 4 invalid.	- Invalid or not yet valid vehicle code entered.	- Enter a valid vehicle code for vehicle 4.
3005	Vehicle code for vehicle 5 invalid.	- Invalid or not yet valid vehicle code entered.	- Enter a valid vehicle code for vehicle 5.
3006	Vehicle code for vehicle 6 invalid.	- Invalid or not yet valid vehicle code entered.	- Enter a valid vehicle code for vehicle 6.
3007	Vehicle code for vehicle 7 invalid.	- Invalid or not yet valid vehicle code entered.	- Enter a valid vehicle code for vehicle 7.
3008	Vehicle code for vehicle 8 invalid.	- Invalid or not yet valid vehicle code entered.	- Enter a valid vehicle code for vehicle 8.
3010	Left axle position is not calibrated.	- Left axle position is not calibrated.	- Teach left axle position.
3011	Center axle position is not calibrated.	- Center axle position is not calibrated.	- Teach center axle position.
3012	Right axle position is not calibrated.	- Right axle position is not calibrated.	- Teach right axle position.
3013	Current controller is not calibrated.	- Current controller is not calibrated.	- Teach current controller.
3014	Pressure sensor is not calibrated.	- Pressure sensor is not calibrated.	- Teach pressure sensor neutral position.
3015	TAC-sensor is not calibrated.	- TAC-sensor is not calibrated.	- Teach TAC-sensor neutral position.
3016	Rowfinder is not calibrated.	- Rowfinder is not calibrated.	- Teach rowfinder neutral position.
3017	GPS antenna high is not calibrated.	- GPS antenna high is not calibrated.	- Teach mounted height of GPS-receiver.
3018	GPS antenna offset left - right is not calibrated.	- GPS antenna offset left - right is not calibrated.	- Teach left and right offset of GPS-receiver center position.
3019	GPS antenna look ahead is not calibrated.	- GPS antenna look ahead is not calibrated.	- Teach look ahead of GPS-receiver.
4000	No communication to TVWA.	- No CAN information is received from TVWA.	- Check cables from PSR iBox to TVWA. - Check vehicle code.
4020	No communication to Braud.	- No CAN information is received from Braud.	- Contact the software department.
4021	No communication to Braud.	- No CAN information is received from Braud.	- Contact the software department.
4022	No communication to Braud.	- No CAN information is received from Braud.	- Contact the software department.
4023	No communication to Braud.	- No CAN information is received from Braud.	- Contact the software department.
4024	No communication to Braud.	- No CAN information is received from Braud.	- Contact the software department.

Error-No.:	Description	Cause	Troubleshooting
9100	EEPROM write error.	- EEPROM is defective. - EEPROM is busy.	- Contact the software department.
9101	EEPROM write error.	- EEPROM is defective. - EEPROM is busy.	- Contact the software department.
9102	EEPROM parameters must be checked.	- Older software installed.	- Check all parameters and settings.
9103	EEPROM parameters were changed automatically.	- After a software update, it is necessary in some cases to set parameters to the default values.	
9104	EEPROM parameters outside valid range.	- After readout at least one parameter was outside valid range and was set to default.	- Contact the software department.
9991	Task 1 running time exceeded.	- Task 1 requires too much computing time.	- Contact the software department.
9992	Task 2 running time exceeded.	- Task 2 requires too much computing time.	- Contact the software department.
9993	Task 3 running time exceeded.	- Task 3 requires too much computing time.	- Contact the software department.
9994	Task 4 running time exceeded.	- Task 4 requires too much computing time.	- Contact the software department.
9997	USER stack overflow.	- USER stack size to small.	- Contact the software department.
9998	Internal computing error.	- Function has computing problems.	- Contact the software department.
9999	Error ISO - Lib.	- Error has occurred within ISO - Lib.	- Please take a note of the “Error ISO” number. This is located in the Diagnostic. Give this number to the software department.

11. Trade Terms and Abbreviations

Term	Abbreviation	Description
Satellite supported position signals	GPS	24 earth circling satellites send GEO-positioned signals to earth bound receivers.
Accuracy		Accuracy of a certain position which can be relocated within 24 hours.
Correction signal	DGPS	A correction signal which corrects inaccuracies like time deviation, ion spherical tensions or GPS system malfunctions.
Wide Area Augmentation System	WAAS	Correction signal US Gov.
European Geo-Stationary Navigation Overlay System	EGNOS	Correction signal for Europe and West Russia.
Beacon		Low cost correction signal. Check availability.
Omnistar		Low cost correction signal. Check availability.
Real Time Kinematics Correction Signal	RTK	Correction signal available through a base station.
Baud		Transmission speed.
National Marine Electronics Association	NMEA 0183	NMEA 0183 is a standard protocol used by GPS receivers to transmit data.
Recommended Minimum Specific Global Navigation Satellite Support Data	GPRMC	Part of the NMEA 0183 protocol.
Global Positioning System Fit Data	GPGGA	Part of the NMEA 0183 protocol.
Parameter		Fixed value
Port		Serial interface
CAN BUS		data bus
Slip		Ratio of the speed of a driven wheel to that of a non-driven co-rotating wheel.

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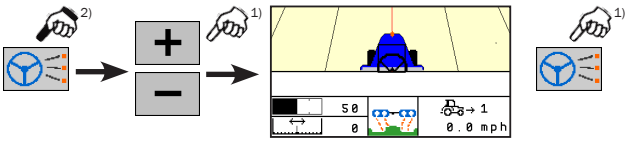
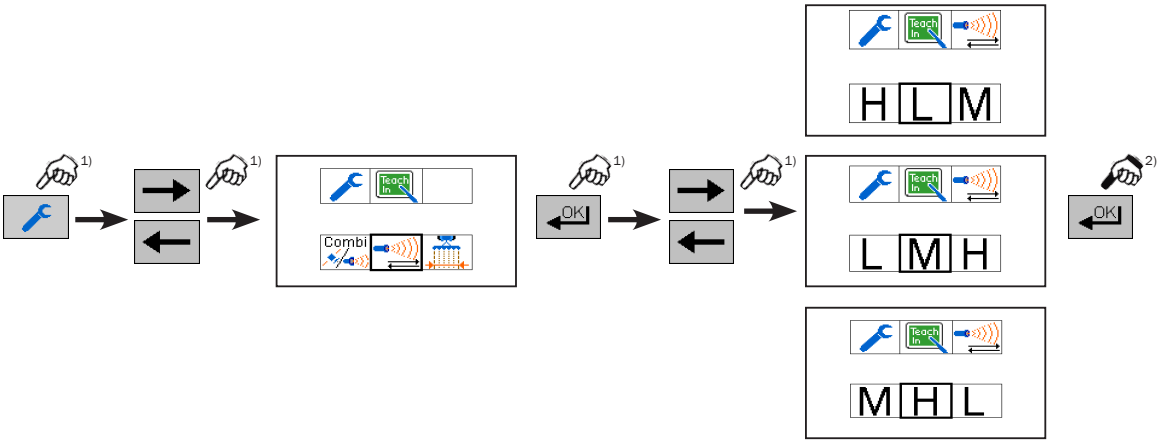
PSR Sonic

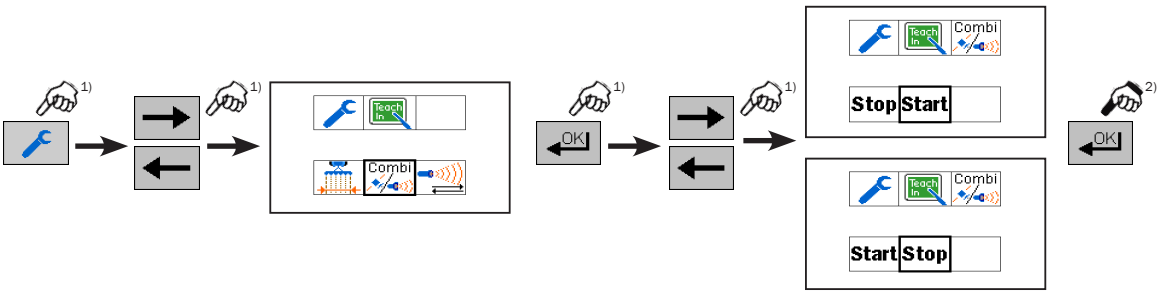
Select drive mode



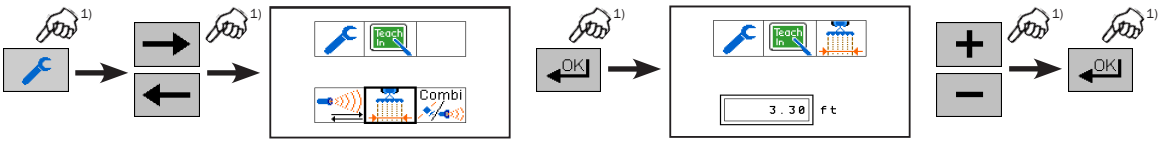
Set sample spacing



Switching PSR SONIC - PSR SKY on and off



Set working width



Let's stay on track

Legend: 1) Press briefly 2) Press and hold, until there is reaction.

Attention! Read and observe the manual and safety instructions prior to operation.

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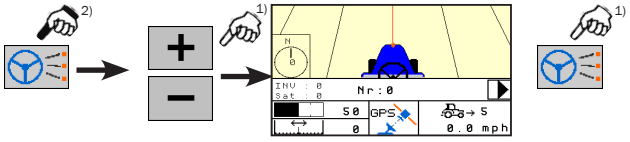
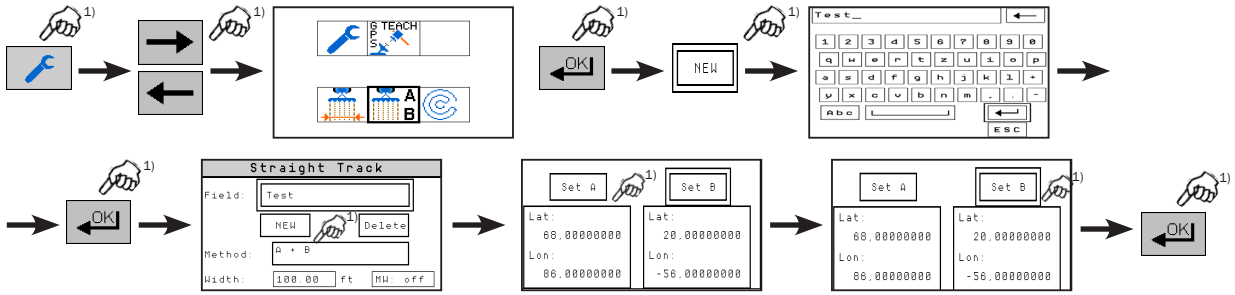
PSR SKY

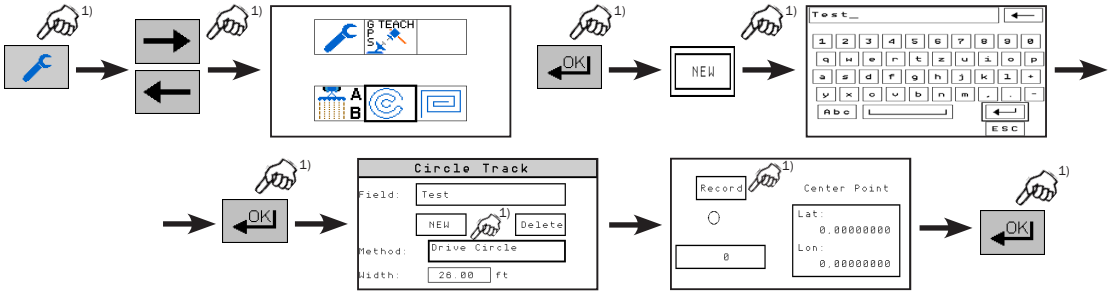
Select drive mode



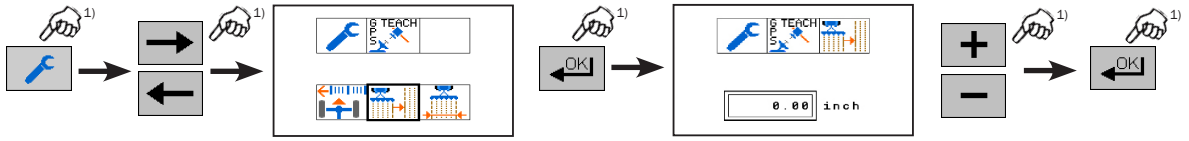
Set A-B / A+



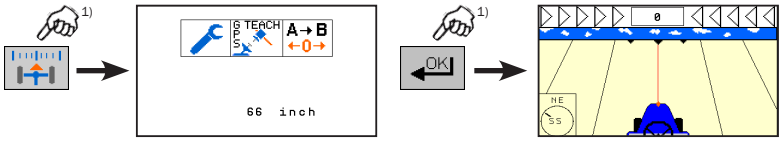
Set circles



Set implement offset



Calibrate reference line



Let's stay on track

Legend: 1) Press briefly 2) Press and hold, until there is reaction.

Warning !
The automatic steer system must be switched off when driving on streets and public roads.

Attention! Read and observe the manual and safety instructions prior to operation.

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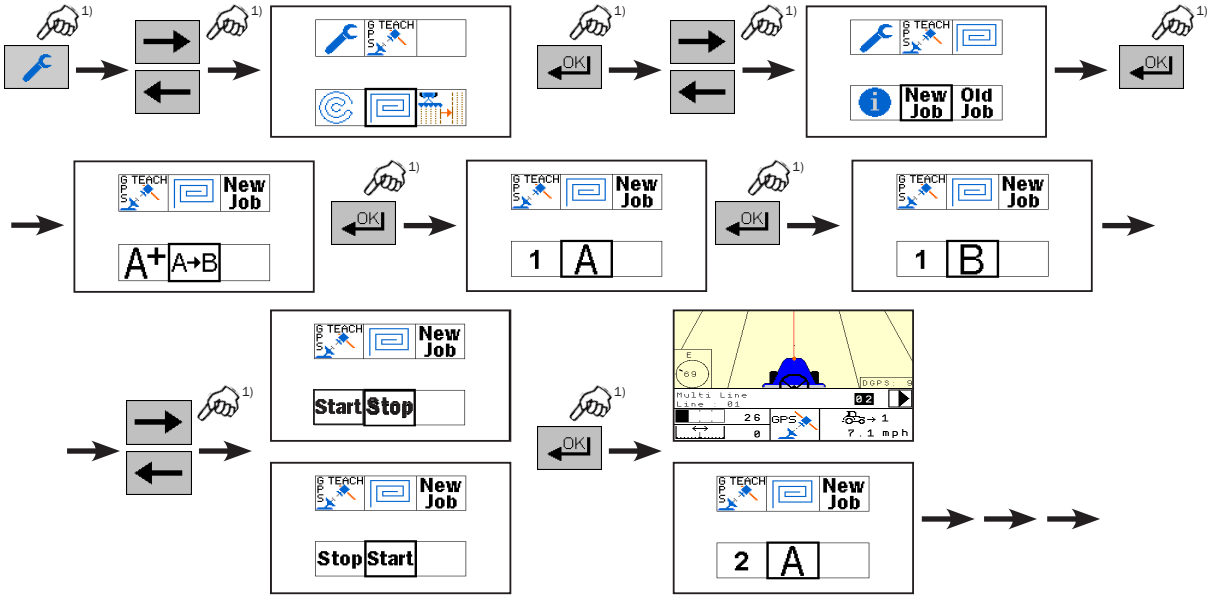
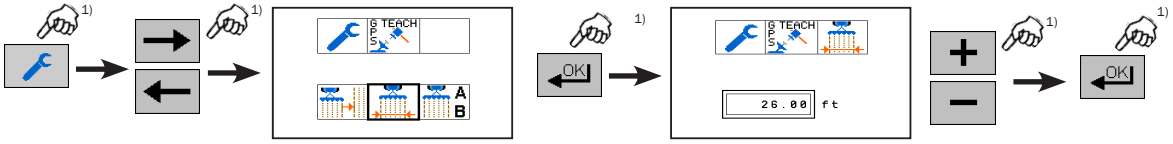
PSR SKY

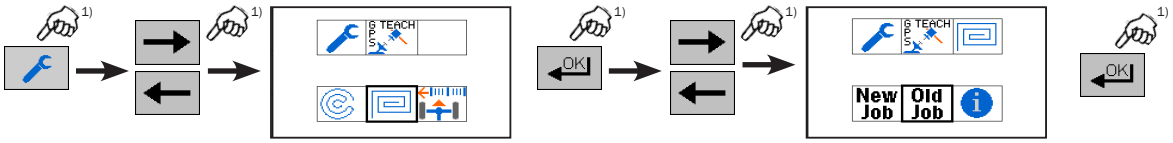
Set multi-line



Set working width multi-line



Select stored multi-line



Let's stay on track

Legend: 1) Press briefly 2) Press and hold, until there is reaction.

Warning !
The automatic steer system must be switched off when driving on streets and public roads.

Attention! Read and observe the manual and safety instructions prior to operation.

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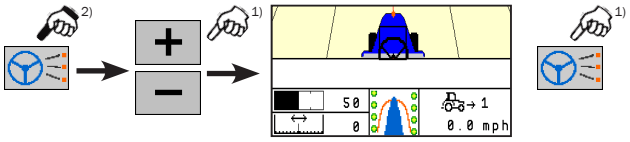
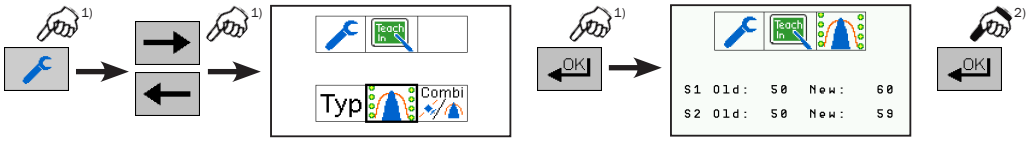
PSR TAC

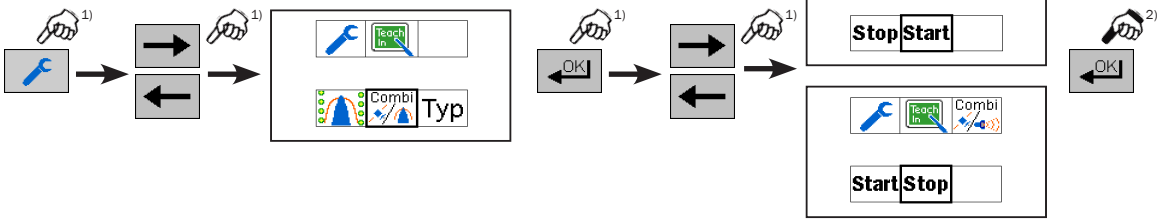
Select drive mode



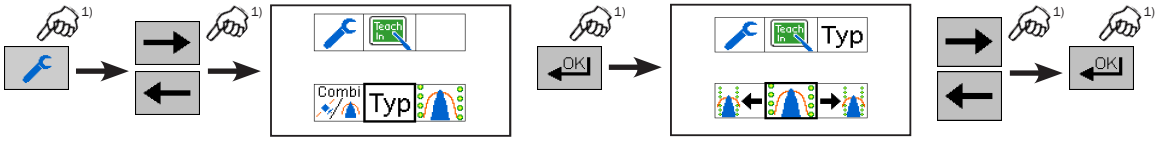
Calibrate TAC sensor



Switching coupling PSR TAC - PSR SKY on and off



Select TAC sensor



Let's stay on track

Legend: 1) Press briefly 2) Press and hold, until there is reaction.

Attention! Read and observe the manual and safety instructions prior to operation.