

# **Translation of the Original Operator's Manual ULTRA GUIDANCE PSR ISO**

Automatic Steering System for  
Tractors and self-propelled Machinery  
in Agriculture and Forestry

Item # 560145-0A

Version EN 2.0  
As of SW version PSR 02.170.001  
April 2017

## **Imprint**

All rights reserved

© Copyright by

Reichhardt GmbH Steuerungstechnik

Hofgut Ringelshausen

35410 Hungen / Germany

Phone +49 (0) 6043 - 9645 - 0

Fax +49 (0) 6043 - 4365

Web [www.reichhardt.com](http://www.reichhardt.com)

E-mail [welcome@reichhardt.com](mailto:welcome@reichhardt.com)

This manual, even in extracts, may only be reprinted, copied or otherwise reproduced with the express permission of Reichhardt GmbH.

Any type of reproduction, distribution or storage on data storage devices in any form and type which has not been authorized by Reichhardt GmbH constitutes a violation of the applicable national and international copyright and will be prosecuted.

Individual figures may differ slightly from the actual scope of delivery received. This does not have any effects on the function or operation.

All information, figures and technical data in this publication represent the latest version available at the time of publication. Changes to the design can be made at all times and without prior notice.

Responsible party for the content and layout of this publication: Reichhardt GmbH Steuerungstechnik

## Contents

<b>1</b>	<b>General Information.....</b>	<b>1</b>
1.1	Reading and Observing the Manual .....	1
1.2	Understanding the Manual.....	1
1.3	Safety Messages .....	2
1.4	Warranty and Liability .....	2
1.5	Service and Repair.....	2
<b>2</b>	<b>For your own Safety.....</b>	<b>3</b>
2.1	Intended Use .....	3
2.2	Requirements of the Operating Personnel.....	3
2.3	Safety Instructions for Installation and Servicing .....	4
2.4	Safety Instructions for Electrics .....	5
2.5	Safety Instructions for the Hydraulic System (for Hydraulic Steering Systems).....	6
2.6	Application and Servicing of Warning Signs.....	6
2.7	Obtaining an Approval for Road Operation.....	6
2.8	Safety Instructions for Commissioning and Operation .....	7
2.9	Safety Instructions regarding Disposal .....	8
<b>3</b>	<b>System Description.....</b>	<b>9</b>
3.1	Installation Versions.....	9
3.2	Basic Modules.....	10
3.3	Sensor Modules .....	10
3.3.1	PSR SKY.....	10
3.3.2	PSR SONIC.....	10
3.3.3	PSR TAC.....	11
3.3.4	PSR MEC and MEC+ .....	11
3.4	Assembly of Special System Components .....	12
3.4.1	RDU Steering Assistant with Friction Wheel Motor .....	12
3.4.2	RDU2 Steering Assistant with Sprocket Motor.....	13
3.4.3	GPS Receiver Vehicle Change .....	14
3.4.4	Terminal Vehicle Change .....	15
<b>4</b>	<b>Operator Interface .....</b>	<b>17</b>
4.1	Switching Steering System on and off.....	17
4.2	Main Screen .....	17
4.2.1	Main Display Field.....	18
4.2.2	Information Fields .....	18
4.2.3	Function Keys .....	19

## CONTENTS

4.3	Activation and Deactivation of ULTRA GUIDANCE PSR ISO .....	20
4.4	Select Steering mode.....	22
4.4.1	Automatic Steering mode .....	22
4.4.2	Manual Steering mode – Steering by Wire.....	24
4.5	Adjust Response .....	25
4.6	Set Distance .....	26
4.7	Travel Direction.....	27
<b>5</b>	<b>Menu.....</b>	<b>29</b>
5.1	Menu Levels .....	29
5.1.1	Menu Display.....	30
5.1.2	Numerical Input.....	30
5.1.3	Text Entry .....	31
5.1.4	Save Changes.....	31
5.2	Call up Menu .....	31
5.2.1	Terminal Configuration.....	32
5.2.2	Set Vehicle Number .....	34
5.2.3	Set GPS Receiver .....	35
5.2.3.1	GPS Source RS 232 .....	36
5.2.3.2	GPS Source NMEA 2000 .....	39
5.2.3.3	GPS Source J 1939.....	39
5.2.4	Modem Configuration .....	40
5.2.5	Calculator.....	42
5.2.6	Teach-In Menu.....	43
5.2.6.1	Vehicle Speed .....	44
5.2.6.2	Setting the Position Sensor .....	48
5.2.6.3	Activate/deactivate TRACK-LEADER TOP.....	51
5.2.6.4	Adjust the Joystick.....	52
5.2.6.5	Changing CAN 1 and CAN 2 .....	54
5.2.7	Diagnosis .....	55
5.2.7.1	Vehicle Diagnosis .....	55
5.2.7.2	Read out Error Memory .....	58
5.2.8	System Information.....	59
<b>6</b>	<b>PSR SKY .....</b>	<b>61</b>
6.1	Menu Structure .....	61
6.2	Main Screen/Main Menu PSR SKY.....	62
6.2.1	Main Screen PSR SKY.....	62
6.2.2	Main Menu PSR SKY.....	64

6.3	Overview GPS Operation Mode .....	65
6.3.1	A-B Mode .....	67
6.3.1.1	Straight Track .....	67
6.3.1.2	Multi Width .....	70
6.3.2	Circle Track Mode.....	73
6.3.3	Multi-line Mode .....	75
6.4	Set Working Width.....	81
6.5	Set the Implement Offset .....	82
6.6	Set Nudging.....	84
6.6.1	GPS Performance.....	85
6.7	Working with PSR SKY .....	87
6.7.1	Calibrate Reference Lines .....	87
6.7.2	Working with the Multi-line .....	88
<b>7</b>	<b>PSR SONIC .....</b>	<b>89</b>
7.1	PSR SONIC – Application-specific Changes/Vehicle Changes: Mount and Set Sensors .....	89
7.1.1	Mount PSR SONIC Sensor .....	89
7.1.2	Set PSR SONIC Sensors.....	90
7.2	Main Screen/SONIC Configuration .....	92
7.2.1	PSR SONIC Main Screen.....	92
7.2.2	SONIC Configuration .....	92
7.3	PSR SONIC Operation Mode.....	93
7.3.1	Tramline Intersection .....	94
7.3.2	Tramline outside.....	95
7.3.3	Swath Center and Swath with Alternation.....	96
7.3.4	Crop Edge .....	97
7.3.5	Crop Edge Crosswise .....	98
7.3.6	Crop Edge with Correction .....	99
7.4	Adjust PSR SONIC .....	100
7.4.1	Working Area .....	100
7.4.2	Response.....	101
7.4.3	Filter .....	101
7.4.4	Mode.....	103
7.4.5	Tilt Sensor.....	104

## CONTENTS

<b>8</b>	<b>PSR TAC .....</b>	<b>105</b>
8.1	PSR TAC – application-specific changes/vehicle changes: Mount and Set Sensors .....	105
8.2	Main Screen/TAC Configuration .....	106
8.2.1	PSR TAC Main Screen .....	106
8.2.2	TAC Configuration .....	106
8.3	PSR TAC Operation Mode .....	107
8.4	Adjust PSR TAC .....	108
8.4.1	PSR TAC Operation Mode .....	108
8.4.2	Calibrate TAC Sensor.....	109
8.4.3	Mode .....	109
8.4.4	Tilt Sensor.....	110
<b>9</b>	<b>PSR MEC and PSR MEC+ .....</b>	<b>111</b>
9.1	PSR MEC/PSR MEC+– Application-specific Changes/Vehicle Changes: Mount Sensors .....	111
9.2	Main Screen/TAC Configuration .....	112
9.2.1	PSR MEC Main Screen.....	112
9.2.2	PSR MEC Configuration .....	112
9.3	Setting PSR MEC/MEC+ .....	113
9.3.1	Calibrate PSR MEC.....	113
9.3.2	Signal Inversion .....	114
9.3.3	Mode .....	114
9.3.4	Tilt Sensor.....	115
<b>10</b>	<b>Advanced Functions.....</b>	<b>117</b>
10.1	Combi Mode .....	117
10.2	Sensor+ mode.....	120
10.3	Use of the PSR Joystick .....	121
10.4	AUX-N Functionality .....	122
10.5	Super Low Speed Function.....	122
10.6	John Deere Split Screen .....	123
<b>11</b>	<b>Servicing .....</b>	<b>125</b>
<b>12</b>	<b>Working and Storage Conditions .....</b>	<b>127</b>
<b>13</b>	<b>Error List.....</b>	<b>129</b>

# 1 General Information

These operating instructions describe the configuration and operation of PSR Guidance Systems of *Reichhardt GmbH Steuerungstechnik*. In addition, small assembly works to be carried out by the operator are explained.

## 1.1 Reading and Observing the Manual

Please precisely observe and comply with all information and instructions to ensure proper functioning of the PSR Guidance System and to prevent personal injury and damage to property. In case of problems in understanding parts of these instructions or for other support, please contact Reichhardt.

The operator's manual is an integral part of the steering system and must be passed on after sale to the new owner of the system.

## 1.2 Understanding the Manual

### Dimensions

The dimensions in this manual correspond to the metric system. Instructions in English language do also consider the imperial system if required.

### Directions

The directions "right" and "left" are generally to be understood from the driver seat in the direction of travel.

### Figures

The figures shown in this manual only serve for reference. Figures for installation may deviate according to the vehicle model/equipment and the individual installation situation and do not have any influence on the functionality of the system. Software figures may also slightly deviate from actual displays due to different software versions and steering modes.

### Language

This manual is possibly available in other languages. For further information, please contact us via phone or email.

### 1.3 Safety Messages

In this manual, the warning messages described below are used. They indicate possible personal injury or property damage and point out important information.



This symbol warns you of an imminent danger resulting in serious personal injury or death.



This symbol warns you of a potentially dangerous situation which may result in serious personal injury or death.



This symbol warns you of potentially dangerous situations which may result in minor or moderate personal injury.



This symbol indicates important information that, if disregarded, can result in property damage or malfunction of the PSR Guidance System or the vehicle. Follow these instructions to ensure long life and proper functionality of the PSR Guidance System and the vehicle.

### 1.4 Warranty and Liability

Warranty or liability claims shall be applicable according to the General Terms and Conditions of Reichhardt GmbH Steuerungstechnik. You can find the General Terms and Conditions at [www.reichhardt.com](http://www.reichhardt.com).

Reichhardt will not assume any liability for damages resulting from an improper use.

#### Use of not approved Accessories and Spare Parts

Only accessories and spare parts approved by Reichhardt may be used for PSR Guidance Systems. These are specifically designed for the PSR Guidance System and meet high standards in terms of safety and reliability. Reichhardt expressly points out that accessories and spare parts not approved by Reichhardt must not be used with Reichhardt systems. Otherwise, the safety and operational readiness of the system might be impaired. Furthermore, malfunctions of the system may lead to personal injury or property damage. Reichhardt will not assume any liability for the use of not approved accessories or spare parts.

#### Unauthorised Modifications of the PSR Guidance System

Any changes to the system which have not expressly been authorized by Reichhardt shall void all warranty claims as well as any liability of Reichhardt for possible malfunctions of the system. Additionally, the EU Declaration of Conformity (CE marking) or other regulatory approvals might become ineffective. This also applies for removal of factory-applied seals or sealing paint.

#### Quality of Work Results

PSR Guidance Systems support the user in his work and facilitate the single work steps. However the driver himself shall be responsible for the quality of his work. As for all other machines, the following shall apply: the more exact the system is configured and operated, the higher will be the quality of the results.

### 1.5 Service and Repair

If you have any questions concerning the PSR Guidance System as well as the ordering of system supplements or spare parts, please contact your dealer or the manufacturer.

Always notify the dealer or Reichhardt immediately in case of damage to the product.



## 2 For your own Safety

PSR Guidance Systems are thoroughly designed and manufactured according to the accepted rules of engineering. There are however residual risks when handling PSR Guidance Systems which might endanger the safety and health of persons. These residual risks shall be avoided by the intended use of the PSR Guidance System. It is therefore indispensable to observe the intended use and the provisions of the enclosed instructions.

Please read the safety instructions carefully and completely. Persons configuring or operating the PSR Guidance System must know and observe the safety instructions. Non-observance of the safety instructions may lead to personal injuries and damage.

Please observe – in addition to the notices in these instructions – the generally applicable regional provisions for occupational safety, health protection, accident prevention and road traffic regulations.

### 2.1 Intended Use

PSR Guidance Systems are designed exclusively for the controlled use in agriculture and forestry, including special cultures (e.g. vineyard, fruit and vegetable cultivation), gardening and landscaping and municipal technology, for the use on non-public roads and lanes.

Any other use shall be deemed unintended and is therefore prohibited.

#### Unintended Use

The steering system is not suitable for use on narrow dikes or dams or on steep slopes on which the vehicle is at risk of rolling-over or in an explosive environment.

The individual components of the PSR Guidance System must not come into contact with chemicals such as acids, lyes, oils, lubricants or aggressive substances from petrol chemistry.

#### Furthermore, the Following shall apply:

The intended use also includes compliance with the operating conditions as well as the maintenance and servicing provisions specified by Reichhardt.

For damage resulting from unintended use, Reichhardt will not accept any liability. The risks of an unintended use shall be borne solely by the user.

### 2.2 Requirements of the Operating Personnel

Every person who autonomously configures or operates the PSR Guidance System, must meet the following minimum requirements:

- Has a driving license for the relevant vehicle.
- Is in the physical and mental condition to control the vehicle and to operate the PSR Guidance System.
- Is not under the influence of medication, alcohol or drugs which impair the ability to react in any way.
- Understands the mode of operation of the vehicle and is allowed to guide it (has a driving license for the relevant vehicle).
- Has read and understood these instructions completely, understands the mode of operation of the PSR Guidance System and is able to safely perform works on the vehicle and the PSR Guidance System as well as to identify and avoid potential dangers and risks during the works to be performed.

## 2.3 Safety Instructions for Installation and Servicing

Installation, configuration and servicing works require that the procedures are known.

If technically possible, installation and servicing of the PSR Guidance System must always be carried out with the vehicle fully at standstill and with the engine switched off. The operator of the vehicle must ensure that the vehicle cannot be started unintentionally or against prior arrangement by unauthorised persons. As necessary, remove the ignition key.

If installation or servicing is required at the running vehicle or PSR Guidance System, only authorised personnel are allowed to access the danger area (refer to Fig. 2) after clear confirmation by the operator. These personnel have to be informed precisely on any potential dangers before entering the danger area. All tasks have to be precisely agreed on in advance by the operator and these personnel.

Always ensure that hands, feet and clothing do not project into the danger area of driven components. Switch off all drive systems and de-pressurise the system at the dedicated operating equipment.

In addition, the following installation and servicing provisions must be observed:

- Properly use and dispose of cleaning agents, substances and materials.
- Take into account that components might have been heated by the operation of the vehicle.
- Remove accumulations of lubricants, oil or dirt on the vehicle.
- Use a ladder or a platform in order to facilitate installation, deinstallation or servicing of components at higher positions. Pay attention to a stable, safe position and use stable, safe handles.
- Do not perform any installation or servicing works at higher positions under wet or icy weather conditions.
- Please observe the safety instructions regarding the electrics (see Chapter 2.4) and hydraulics (see Chapter 2.5).
- Report and/or remedy any damage immediately.
- Always pay attention to a good condition and proper assembly of all components.
- Obtain the parts to be replaced (screws, hose lines, etc.) only from Reichhardt in order to ensure reliability, proper function and safety of the vehicle and of the PSR Guidance System.

## 2.4 Safety Instructions for Electrics

When performing works on the electrical system of the vehicle, you need to disconnect the power supply of the vehicle for safety reasons. Switch off the battery master switch. If there is no switch or if you want to perform welding works on the vehicle or works in the vicinity of the battery, you need to disconnect the battery.

The battery may represent a danger due to electrical currents, short circuit with high current, leaking battery acid or an explosion. This could result in severe burns or corrosion. Always take the battery in and out of operation properly.

When removing and installing the battery, the following precautions must be observed:

- Remove jewelry and other metallic objects.
- Use tools with insulated handles.
- Do not place any tools or metallic objects on the battery.
- Disconnect the NEGATIVE terminal first and then the POSITIVE terminal (see Fig. 1).
- Always place the battery horizontally on a clean surface.
- When inserting the battery, fix it with the bracket provided for this purpose.
- Connect the POSITIVE terminal first and then the NEGATIVE terminal.
- When installing additional equipment, make sure that there will be no contact with other metallic objects.

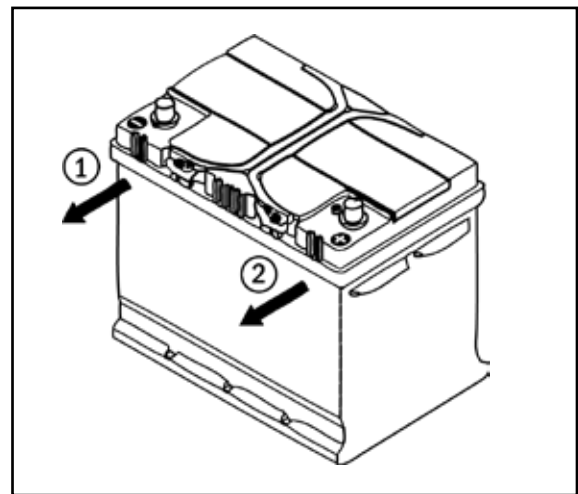


Fig. 1: Disconnecting the battery

## 2.5 Safety Instructions for the Hydraulic System (for Hydraulic Steering Systems)

During operation of the vehicle, hydraulic oil might escape from defect or not securely fixed hose lines under high pressure and lead to severe injuries of the skin or wound infections. Immediately seek medical advice. If hydraulic oil has penetrated the skin, it must be removed surgically within few hours.

Never try to feel or seal leaks in hydraulic hoses manually. Keep a sufficient distance, protect you and your hands and use suitable means to search for leaky spots.

Have old, worn or damaged hose lines replaced by parts approved by Reichhardt immediately.

The duration of use of hydraulic hoses should not exceed six years (operating duration including a maximum of two years storage period). For hoses and lines made of thermoplastics, other reference values may apply.

## 2.6 Application and Servicing of Warning Signs

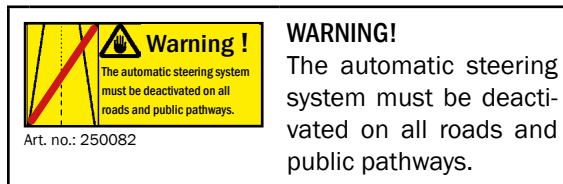
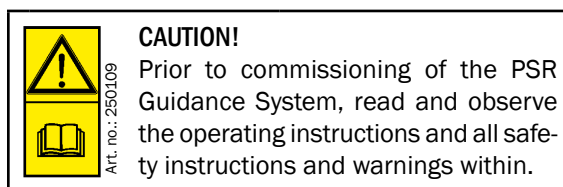
Vehicles equipped with the PSR Guidance System must be marked with warning signs to point out potential dangers.

Please attach warning signs to the A column of the vehicle so they are clearly visible.

The warning signs are an integral part of the PSR Guidance System and are enclosed with the operator's manual.

Warning signs must always be kept in a clean and clearly readable condition. Damaged or unreadable warning signs must be replaced immediately. Warning signs are available for order from Reichhardt.

The warningsigns are also available in other languages. For further information, please contact us by phone or e-mail.



## 2.7 Obtaining an Approval for Road Operation

Contact a responsible traffic approval authority in order to receive information on an official approval for road operation in your country. An approval not granted might lead to the loss of the public operating authorization of the vehicle.

## 2.8 Safety Instructions for Commissioning and Operation

The PSR Guidance System must not be used on public roads and pathways. Prior to road travel, deactivate the PSR Guidance System.

Immediately switch off the steering system in dangerous situations or drive the vehicle manually to avoid personal injury or material damage.

Be prepared to drive the vehicle manually at the end of the track, since the steering system does not turn the vehicle automatically.

Watch out for obstacles when using the steering system in order to prevent damage to the vehicle and other components. The steering system is not able to detect them automatically.

Discontinue operations if it is no longer possible to detect obstacles or persons quickly enough as a result of poor visibility conditions.

When the driver seat is vacated, the PSR Guidance System is deactivated automatically. Switch it off additionally at the activation switch and secure the vehicle against unintended start-up and rolling before leaving it.

To avoid personal injury and material damage during operation, follow the following instructions:

- As soon as the steering system is switched on, nobody may remain in the danger zone (see Fig. 2). The operator is obliged to stop the vehicle immediately as soon as persons enter the danger zone. Persons in the danger zone are exposed to the risk of serious or even fatal injury. Persons might be rolled over by the machine if there is a machine malfunction. The operator may only start the steering system again if there are no persons in the danger zone.
- The transport of persons on the passenger seat is **ONLY** permitted for training, service or brief observation purposes. Additional persons might distract the operating or service staff or obstruct their view. During training courses, only particularly experienced persons may be commissioned to drive the vehicle which is equipped with this steering system.
- For safety reasons, you should always keep one hand at the steering wheel when using the automatic steering system at speeds higher than 6 mph (10 km/h). You can thus react immediately if danger points, persons or obstacles appear in the field or if malfunctions occur in the steering system.

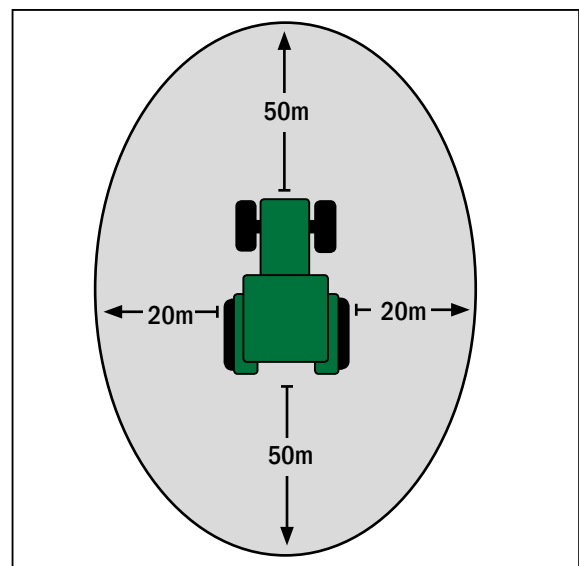


Fig. 2: Danger zone

## 2.9 Safety Instructions regarding Disposal

For the disposal of the PSR Guidance System, please observe the following safety provisions:

- Dismount the PSR Guidance System and sort the parts according to material characteristics.
- Obtain information on how to dispose of the single components from your relevant municipality or waste management facility. Some of the components shall be subjected to a special waste treatment.
- Dispose of all components according to applicable regulations.

## 3 System Description

ULTRA GUIDANCE PSR ISO is an automatic steering system for all vehicles equipped with hydraulic steering or already prepared for an ISOBUS-compatible automatic steering system.

Depending on the mode of operation, ULTRA GUIDANCE PSR ISO uses various sensors to automatically steer a vehicle along existing tracks or with the help of satellite supported positioning.

### 3.1 Installation Versions

Depending on the vehicle steering system, ULTRA GUIDANCE PSR ISO can be used in three different ways:

#### 1. PSR hBasic

The steering system is implemented via the steering hydraulics of the vehicle and is therefore suitable for all types of hydraulic systems (constant oil pump and “load sensing”).

Benefits:

- Preliminary setup of several vehicles for an easy replacement of the components
- Extremely responsive
- Ideally suited for driving speeds of > 15km/h (9mph)

#### 2. PSR eBasic

Steering signals are transmitted to the vehicle by means of an electronic motor on the steering wheel.

Benefits:

- Easy installation
- Economic preliminary setup
- Ideally suited when used on several vehicles

#### 3. PSR ISO

The steering hydraulic unit is controlled via the ISOBUS installed in the vehicle. This version is therefore suited for all vehicles which are factory-provided with an ISOBUS steering system.

Benefits:

- Plug & Go – the easiest installation
- Economic version
- No changes on the vehicle (steering is not modified)

## 3.2 Basic Modules

ULTRA GUIDANCE PSR ISO comprises three modules which are installed according to vehicle type and purpose and supplemented as an option.

1. The PSR iBox (PSR iBox MC/PSR iBox LT 6D) is the central component of the steering system. It controls all ULTRA GUIDANCE PSR ISO functions by means of a PSR controller.
2. The cable/hose lines and/or connections (electric/hydraulic) are supplied in vehicle-specific kits.
3. Which of the signal sources (ultrasound sensors, flexible tactile sensors, mechanical row finder, satellite-supported correction signal) (these are described in detail in chapter 3.3) is used depends on the respective purpose.

## 3.3 Sensor Modules

ULTRA GUIDANCE PSR ISO can be supplied with steering signals via four different signal sources.

### 3.3.1 PSR SKY

PSR SKY is satellite-supported steering with high precision. It can be used wherever accurate parallel steering without tramlines or plant rows is required or where device working widths must be optimally used by a parallel tracking as accurate as possible (see Fig. 3). The GPS receivers mounted on the vehicle process EGNOS, WAA, Beacon, OMNISTAR or RTK correction signals, as required by the customer. PSR SKY is also compatible with the customer's existing GPS receivers. Prerequisite is a transmission rate of at least 19200 baud, NMEA 0183 compatibility and an update rate of at least 5 Hz.



Fig. 3: PSR SKY

### 3.3.2 PSR SONIC

PSR SONIC is an operation version with ultrasound scanning for high-precision steering along existing tracks, plant rows, track markers, dams, swaths, tramlines or crop edges. There are ten steering modes available. Thanks to the contact-free detection of the leading lines, the SONIC sensors which can be adjusted without tools operate in a wear-free manner. With a precision of less than 3cm (1,2"), PSR SONIC is ideally suited for sowing, planting, harvesting and care in agriculture and vegetable gardening (see Fig. 4).



Fig. 4: PSR SONIC



### 3.3.3 PSR TAC

PSR TAC receives the steering signals via one/several flexible tactile sensor/s. Unique low-wear flexible synthetic tactile feeler detect plants in closed row seed stocks (e.g. corn) in a gentle and precise manner (see Fig. 5).



Fig. 5: PSR TAC

### 3.3.4 PSR MEC and MEC+

PSR MEC and MEC+ is high-precision steering with a mechanical row finder. It guides the machine exactly along the row. High precision can thus be achieved even with nearly closed row seed stocks. Additionally, PSR MEC and MEC+ preserve the plants and avoid damage on the plantation (see Fig. 6 and Fig. 7).



Fig. 6: PSR MEC



Fig. 7: PSR MEC+

### 3.4 Assembly of Special System Components

Upon delivery, ULTRA GUIDANCE PSR ISO will be mounted and commissioned by the Reichhardt customer service in accordance with the relevant safety regulations and the generally accepted rules of technology.

You can interchange certain components of the steering system ULTRA GUIDANCE PSR ISO between vehicles or you must, with the PSR steering assistants RDU and RDU2, tilt them away/remove them from the steering wheel while driving on public roads. The first subchapters (Chapter 3.4.1 and Chapter 3.4.2) describe the mounting and dismounting of the PSR steering assistant. The following chapters describe the mounting and dismounting of the GPS receiver and the terminal.

#### 3.4.1 RDU Steering Assistant with Friction Wheel Motor

Upon initial mounting, the RDU is properly mounted and delivered ready for operation.



#### WARNING

Danger of accidents and injuries due to uncontrolled steering.

Safe steering with tilted steering wheel motor is not possible in road traffic.

The steering wheel motor may hamper you when steering manually.

Always tilt the steering wheel motor away from the steering wheel when driving on roads.

#### Implement RDU in another vehicle

- Place the mounting slider onto the bracket on the steering column.
- Slide the RDU between the bracket on the steering column and the mounting slider using the lug of the bracket (see Fig. 8).
- Slide the motor close enough to the steering wheel so that the friction wheel is approx. 4cm (1.5") (from the steering wheel with tilted steering motor).
- Fix the RDU in this position on the steering wheel on the steering wheel bracket. Tighten the tommy screw on the bottom side of the slider by hand. Do not use any tools or other auxiliaries.
- Link the connection cable of the RDU with the connection of the PSR harness.
- For automatic steering, grasp the motor on the friction wheel and press it away from the steering wheel until the latching mechanism is released (see Fig. 9 – 1) and it is pulled to the steering wheel. The RDU steering assistant is ready for operation (see Fig. 9 – 2).
- Dismounting shall be carried out in reverse order.

#### NOTICE

If the steering wheel is not sufficiently moved by the friction wheel during active operation, the contact pressure is too low. Mount the RDU closer to the steering wheel or increase the spring preload.



Fig. 8: Insert RDU into mounting slider



Fig. 9: Make RDU ready for operation

### 3.4.2 RDU2 Steering Assistant with Sprocket Motor

Upon initial mounting, the RDU2 is properly mounted and delivered ready for operation.



**WARNING**

Danger of accidents and injuries due to uncontrolled steering.

Safe steering with attached steering wheel motor is not possible in road traffic. The steering wheel motor may hamper you when steering manually.

Always remove the motor element of the RDU2 from the steering wheel in road traffic.

#### Implement RDU2 in another Vehicle

- Take the steering wheel motor RDU2 and open the closure.
- Place the RDU2 on the bottom side into the central opening of the bracket on the steering column using the screw (see Fig. 10 – 1).
- Place the RDU2 on the premounted sprocket on the steering column (see Fig. 10 – 2).

**NOTICE**

Ensure that the guide wheels are positioned correctly on the guide rail of the sprocket.

- Close the locking ring of the motor element (see Fig. 11).
- Link the connection cable of the RDU2 with the connection plug on the PSR harness (see Fig. 11 as well). The RDU2 steering assistant is now ready for operation and can be switched on and off using the “ON/OFF switch” on the motor element.
- Dismounting shall be carried out in reverse order.

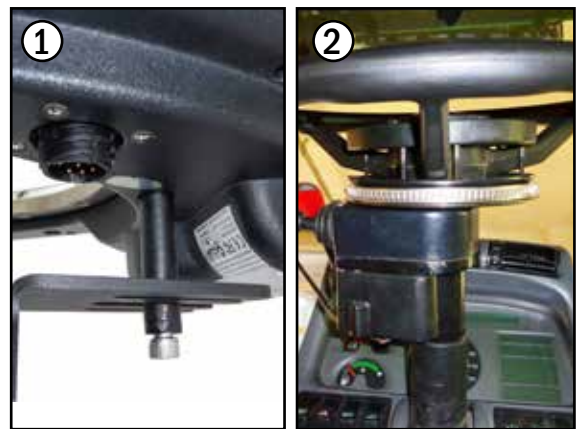


Fig. 10: Place RDU2 in the bracket and on the sprocket



Fig. 11: Locking ring closed and RDU2 connected

### 3.4.3 GPS Receiver Vehicle Change

Changing a GPS receiver (e.g. Reichhardt RGS 101 or RGS 325) is quick and simple.

At first, loosen the receiver connection cable, this will remain on the vehicle (see Fig. 12).

Now remove the GPS receiver from its bracket, the bracket will remain on the vehicle as well. Fig. 13 illustrates the mounting/dismounting of a Reichhardt RGS 101 on a magnetic bracket on a metal plate.

**CAUTION**

Risk of crushing!

The magnet of the mounting kit is very strong and might lead to crushing of the skin.

During mounting/dismounting, pay attention that no body parts are between the bracket plate and the magnet.

**NOTICE**

The GPS receivers RGS 101 and RGS 325 from Reichhardt are supplied with a magnet mounting kit for easy changing. However, GPS receivers may also be mounted on the vehicle with different brackets. Please pay attention to the different attachments of the receivers and the brackets.

Mounting on another vehicle shall be carried out in reverse order.

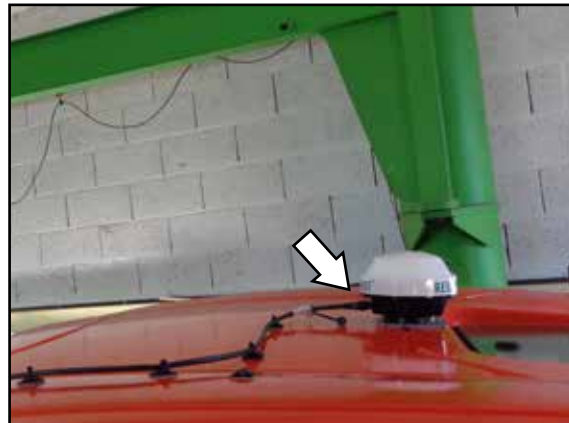


Fig. 12: Loosen receiver connection cable



Fig. 13: Remove GPS receiver from the metal plate



### 3.4.4 Terminal Vehicle Change

Changing an ISO VT (e.g. Reichhardt Basic Terminal) is quick and easy.

Reichhardt Terminals are supplied as standard with a bracket for the B-pillar or with the *PSR REI/ME-Terminal RAM-Mount bracket kit* (702868) as an option.

For mounting/dismounting, loosen the screw connection on the terminal bracket and remove the terminal from the bracket (see Fig. 14 and Fig. 15).

**NOTICE**

Other brackets and terminals require deviating assembly measures. If you have any questions, please contact your retailer.



Fig. 14: Terminal in standard bracket

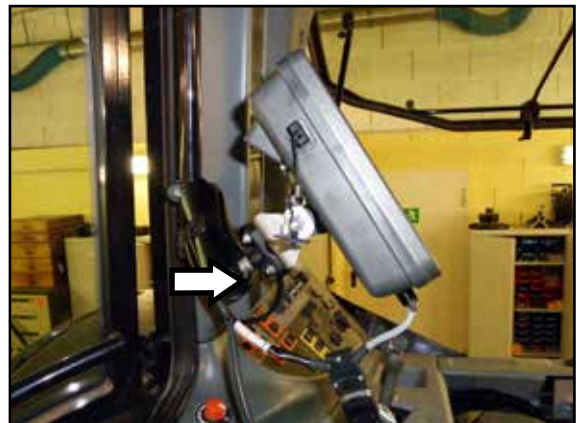


Fig. 15: Loosen screw connection on the bracket



## 4 Operator Interface

### 4.1 Switching Steering System on and off

Switch on ULTRA GUIDANCE PSR ISO using the activation button in the vehicle cab. Ask the service personnel for the position of the main switch.

Make sure you read the warning notices when switching on the PSR and acknowledge them by pressing the "OK" button (see Fig. 16).



Fig. 16: Safety notices when switching on

### 4.2 Main Screen

All settings are made via the ISOBUS terminal.

The display of the PSR mask can be divided into three parts (see Fig. 17):

- A: Main display field
- B: Information fields
- C: Function keys

The three parts are described in the following.

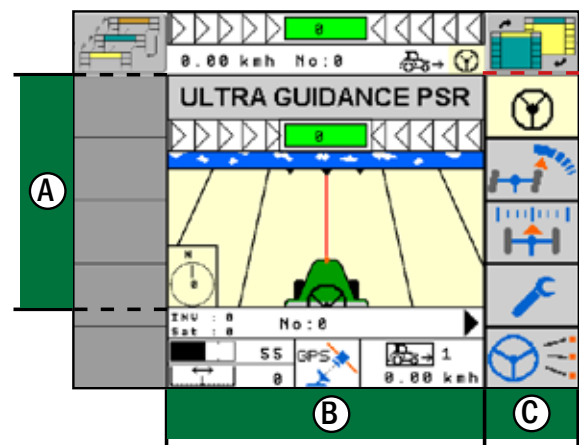


Fig. 17: Main screen overview

### 4.2.1 Main Display Field

The main display field (A) shows the vehicle on its track. The deviation from the current leading line is represented by the arrow at the top. In PSR SKY, the deviation is additionally represented with a numerical value in cm (see Fig. 18). Using the selection buttons of the terminal, please click on the field (1) in order to set one of the three field colors or on the tractor (2) in order to select one of the 17 tractor colors.

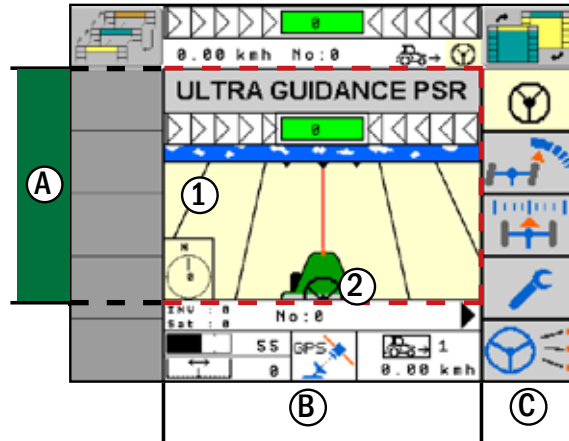


Fig. 18: Main display field

### 4.2.2 Information Fields

The information fields (B) show information on the current steering mode (SKY, SONIC, TAC, MEC) as well as general vehicle information (see Fig. 19).

**Functions of the individual Information Fields**  
(see Fig. 19):

- ① Distance:  
Display of the currently set central offset or of the set nominal distance to the reference edge for the current steering mode.
- ② Response:  
Display of the currently set response for the selected steering mode.
- ③ Steering mode:  
Display of the currently selected steering mode.
- ④ Additional information field:  
Display of further information on the current steering mode, such as number of the current track (only for PSR SKY). If the track number is not displayed in the information field, it is shown at the top of the main display field (see Fig. 19 – 1)
- ⑤ Vehicle information  
Display of the vehicle number, the current speed and the driving direction.

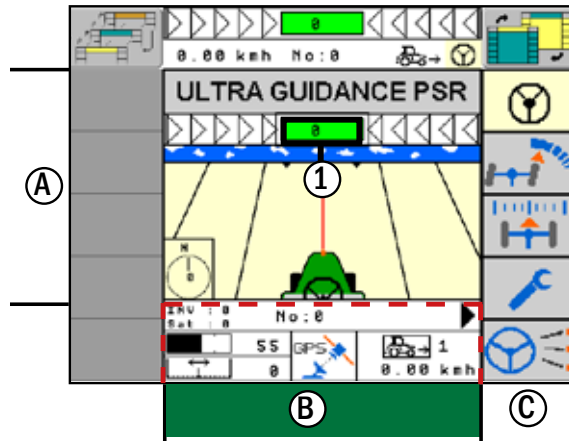


Fig. 19: Information field

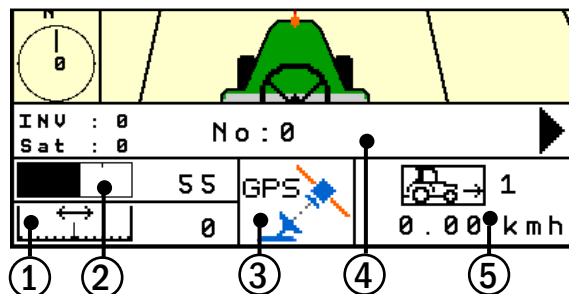


Fig. 20: Functions of the individual information fields



### 4.2.3 Function Keys

Pressing the function keys **C** will lead to one of the following results (see Fig. 21).

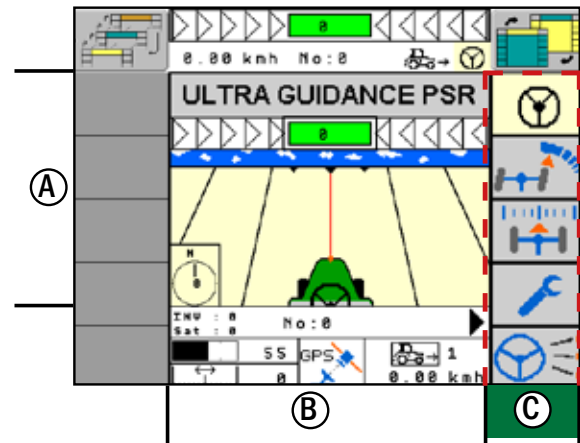


Fig. 21: Function keys

#### Activation Key



Activates/deactivates the automatic steering

#### Response Setting



- Changes into the menu for setting the response
- Confirms the set response
- Switches to the next multi-line

#### Distance Setting



- Changes to the "Distance setting" menu
- Confirms the set distance
- Calibrates the reference line in the GPS mode

#### Main Menu



- A long press will change to the main menu
- A short press will change to the teach menu of the respective steering mode

#### Steering Mode Setting



- Changes to the "Steering mode" menu
- Confirms the selected steering mode
- Changes between automatic and manual steering

#### Escape



Moves one menu level back or cancels the current entry and resets the previous state

#### Arrow right/left



- Browses the menu structure
- Serves as electronic steering wheel "Steering by wire"



#### Arrow up/down



Browses the menus

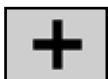


#### OK Key

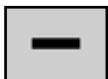


Confirms the menu selection/entry

#### Plus/minus Key



Increases or decreases e.g. input values



### 4.3 Activation and Deactivation of ULTRA GUIDANCE PSR ISO

You can read the status of ULTRA GUIDANCE PSR ISO from the color of the upper function key (see Fig. 22 and list below).



**Yellow:** Automatic steering deactivated



**Flashing green:** Automatic steering activated, however not actively steered



**Continuously green:** Automatic steering activated



**Red:** Error message, steering cannot be activated



Fig. 22: Steering system deactivated – function key yellow

### Activate ULTRA GUIDANCE PSR ISO

The system can only be activated when the main screen of the PSR mask is displayed, the upper function key is yellow as in Fig. 22 and the currently driven speed is not higher than 15km/h (9.3mph).

Activate the system (see Fig. 23) by:

- pressing the function key on the ISOBUS terminal
- actuating the foot switch
- actuating the main switch
- actuating an external activation switch (depending on the vehicle)
- the PSR joystick



Fig. 23: Steering system activated – function key green

### Deactivate ULTRA GUIDANCE PSR ISO

Deactivate the system (see Fig. 24) by:

- pressing the function key on the ISOBUS terminal
- actuating the foot switch
- actuating the main switch
- manually moving the steering wheel
- actuating an external activation switch (depending on the vehicle)
- the PSR joystick



Fig. 24: Steering system deactivated – function key yellow

### Automatic Deactivation

The system will automatically deactivate:

- at excessive speed
- if a system error has occurred
- when the cabin door is opened or when the driver seat is left (depending on version)
- at 0km/h (0mph) after 45 seconds
- if an error has occurred in an external system

## 4.4 Select Steering mode

ULTRA GUIDANCE PSR ISO provides an automatic steering guidance on the basis of various leading line registration systems. The type of leading line registration depends on the sensor and is described by the designation "Steering mode". Before you work with ULTRA GUIDANCE PSR ISO, set the desired steering mode.

PSR SKY, PSR TAC and PSR MEC already describe the corresponding steering mode. For PSR SONIC, there are ten different steering modes available. The differences are determined by the assembly of the ultrasound sensors (see Chapter 7.3).

### 4.4.1 Automatic Steering mode

If you not have already done so, change to the main screen.

Press the function key at the bottom until the symbol flashes (see Fig. 25).

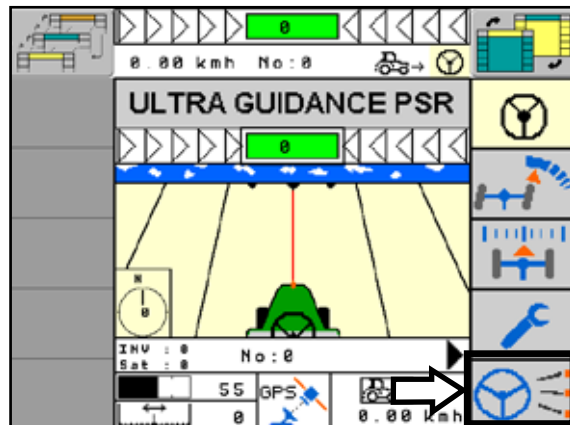


Fig. 25: Call up steering mode selection

Now set the desired steering mode using the displayed plus/minus key (see Fig. 26 – 1).

In the central display of the information fields (see Fig. 26 – 2), you can now see the currently set steering mode.

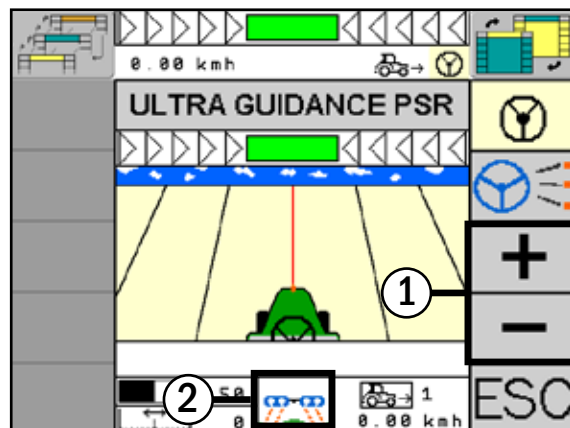


Fig. 26: Select steering mode

Confirm the selected steering mode by briefly pressing the function key for the steering mode selection (see Fig. 27).

**NOTICE**

If the steering mode selection is not completed correctly, the selected steering mode is not saved and the previous steering mode will remain active.

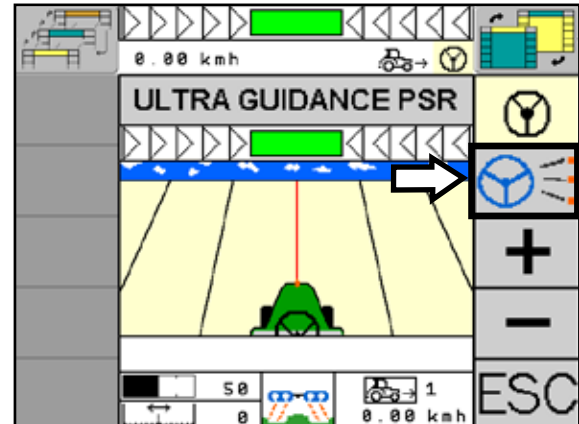
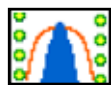


Fig. 27: Confirm steering mode

**Possible Steering modes**

Depending on the steering system version, the following steering modes are available. Further information on the individual steering modes can be found in the relevant chapters (see Chapter 6, Chapter 7, Chapter 8 and Chapter 9).



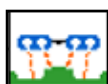
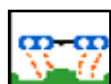
PSR TAC



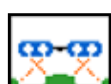
PSR SKY



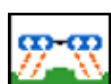
PSR MEC



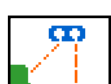
PSR SONIC swath with alternation/swath center



PSR SONIC tramline intersection



PSR SONIC tramline outside



PSR SONIC crop edge height correction left/right side



PSR SONIC crop edge intersection left/right side



PSR SONIC crop edge left/right side

The displayed symbols may vary depending on the version.

#### 4.4.2 Manual Steering mode – Steering by Wire

Briefly press the “Steering mode” function key in order to change between the selected automatic steering mode and the manual mode, also referred to hereinafter as Steering by wire (see Fig. 28).

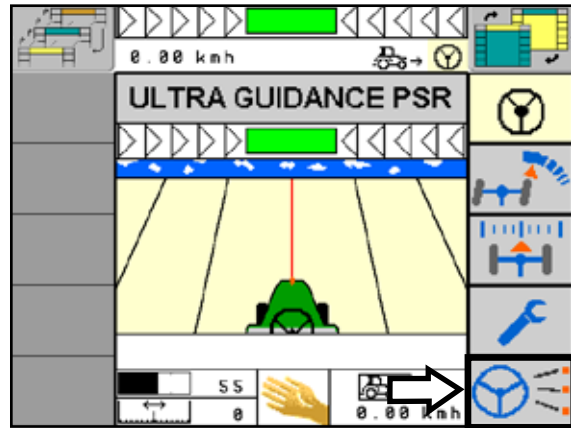


Fig. 28: Activate manual mode

When using “Steering by wire”, you control the vehicle pressing the arrow keys left/right (see Fig. 29).

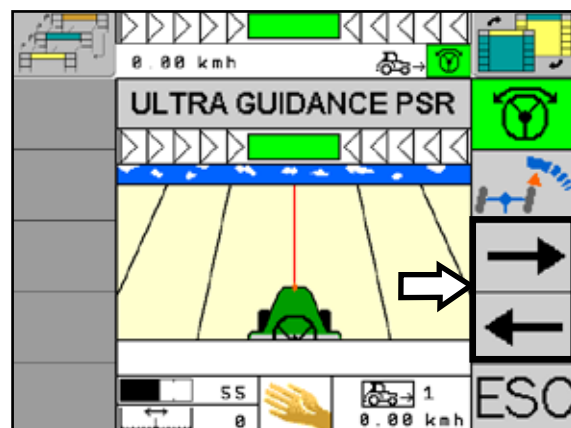


Fig. 29: Manual mode activated

## 4.5 Adjust Response

“Response” denominates the sensitivity of the steering system to movements of the machine/deviations of the machine from the nominal track. A high responsiveness means high sensitivity, the machine will steer in a more aggressive way, a lower responsiveness means low sensitivity, the machine will steer in a more gentle way. This means that the vehicle only performs a small steering movement when a low response is set. When the response is increased, the steered axle moves more strongly.

Press the “Response setting” function key until the symbol flashes (see Fig. 30).



Fig. 30: Response setting

Now press the plus or minus key in order to increase or decrease the response level. The setting range is between 0% and 100% (see Fig. 31 – 1).

**NOTICE**

If no entry is made within 30 seconds, the menu will automatically change back to the main screen. The currently set response level will be saved.

Press the “Response setting” function key again after the setting in order to save the new settings.

When the identification of travel direction is activated (for information on the identification of travel direction see Chapter 4.7), you can set the response for forward and backward movement separately. Please pay attention to the travel direction display (see Fig. 31 – 2 and Fig. 32).

Depending on the activated travel direction, the selected setting will be adopted.

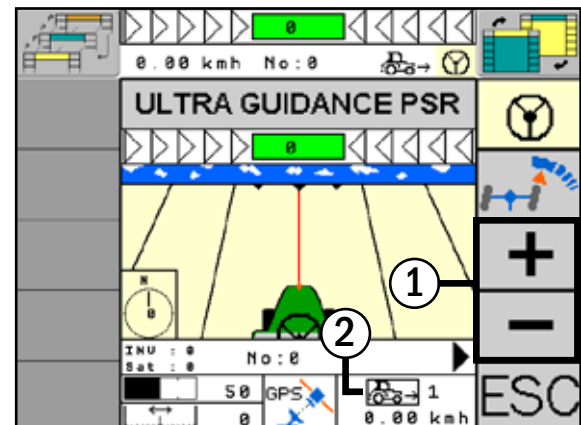


Fig. 31: Set response

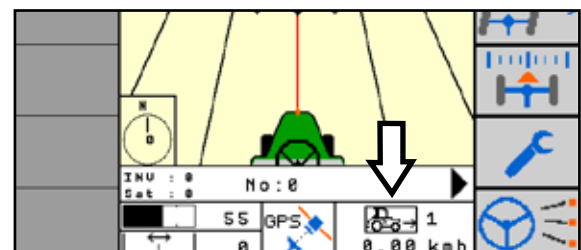


Fig. 32: Set response

## 4.6 Set Distance

“Distance” describes the distance between the machine and the nominal line. The setting of these values is required in order to seamlessly utilize an implement on previous processing lines.

Press the “Distance setting” function key until the symbol flashes (see Fig. 33).



Fig. 33: Distance setting

Set the distance by pressing the left/right arrow buttons. Please consider the selected steering mode. The setting range is between +30 and +90 for the distance from the crop edge or between -50 and +50 for the distance from the middle of the machine (see Fig. 34).

Press the “Distance setting” function key again briefly after the setting in order to save the new settings.



Fig. 34: Set Distance



## 4.7 Travel Direction

ULTRA GUIDANCE PSR ISO is capable of autonomously identifying the travel direction. This depends on the version and configuration of the steering system carried out by the operating personnel.

The status of the travel direction (forward/backward) will be displayed in the information field (see Fig. 35 and Fig. 36).

Depending on the vehicle version, ULTRA GUIDANCE PSR ISO identifies the travel direction via five different modes:

- Forward
- Manually
- Automatic with GPS
- ISO WBSD
- Vehicle-specific

With the “Automatic with GPS” setting, you can actively steer with ULTRA GUIDANCE PSR ISO when used on a tractor and with backward movement up to a speed of 10km/h (6.2mph). For all other platforms and steering modes, ULTRA GUIDANCE PSR ISO identifies the travel direction, but is not capable of steering actively and automatically. This is displayed on the main screen by a green flashing activation button.

If the manual mode is selected, the display, as shown in Fig. 36, becomes a button.

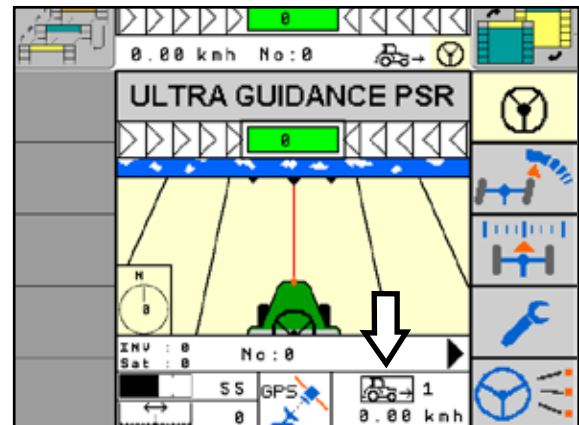


Fig. 35: Travel direction setting

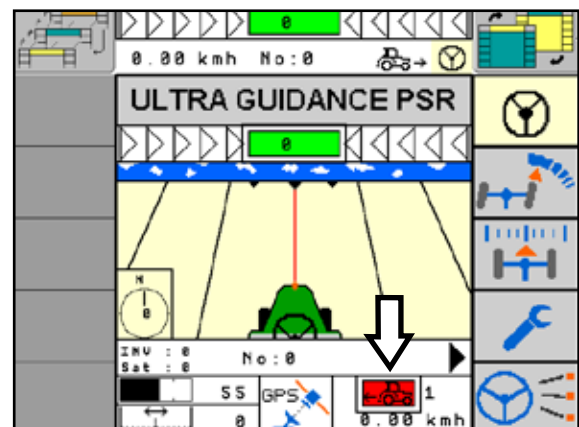


Fig. 36: Travel direction setting button



## 5 Menu

The menu is the central base of ULTRA GUIDANCE PSR ISO and is identified by the wrench function key.

### 5.1 Menu Levels

The central menu structure of ULTRA GUIDANCE PSR ISO is clearly divided into several levels (see Fig. 37).

#### Menu Structure

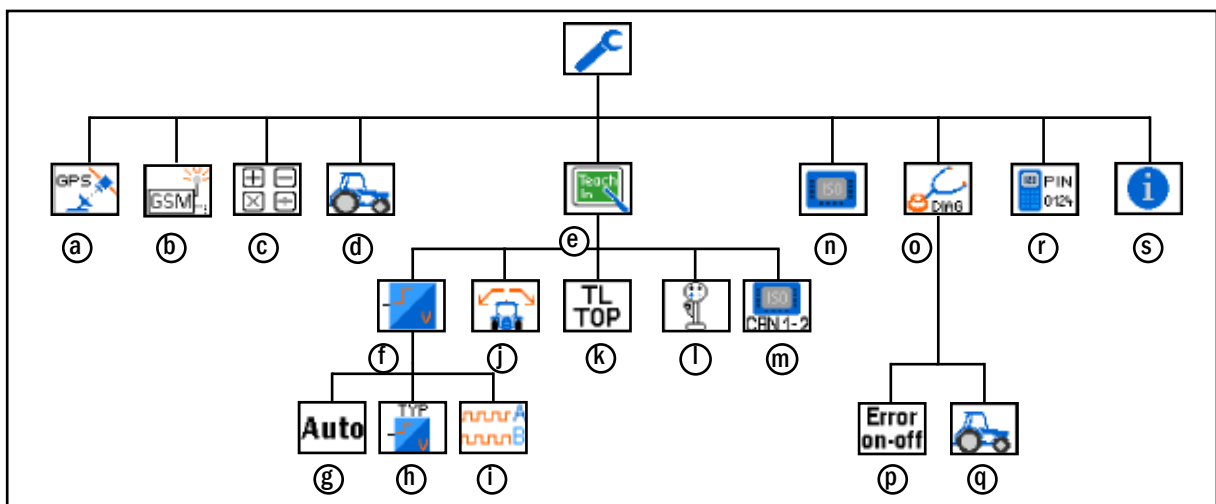


Fig. 37: Menu structure

- |                        |                           |                      |
|------------------------|---------------------------|----------------------|
| Ⓐ GPS receiver setting | Ⓗ Speed source            | ⓪ Diagnosis          |
| Ⓑ Modem configuration  | Ⓘ Via incremental encoder | Ⓟ Error memory       |
| Ⓒ Calculator           | Ⓢ Position sensor setting | Ⓠ Vehicle diagnosis  |
| Ⓓ Vehicle number       | Ⓚ TRACK-LEADER TOP        | Ⓡ Service menu       |
| Ⓔ Teach-In             | Ⓛ Joystick                | Ⓢ System information |
| Ⓛ Vehicle speed        | Ⓜ CAN 1 - 2               |                      |
| Ⓤ Auto                 | Ⓝ Terminal configuration  |                      |

### 5.1.1 Menu Display

The display of the main menu consists of two blocks:

- Location display (see Fig. 38 – 1)
- Menu item selection (see Fig. 38 – 2)

The first line indicates the current position of the system in the menu.

The second line shows the subordinate menu items.

Navigate through the menu items using the “left/right arrow keys”. Confirm your selection with the “OK key” (see Fig. 38 – 3). The selection is always the central symbol in the menu item selection.

Using the “Escape key”, you can move one level back (see Fig. 38 – 4).

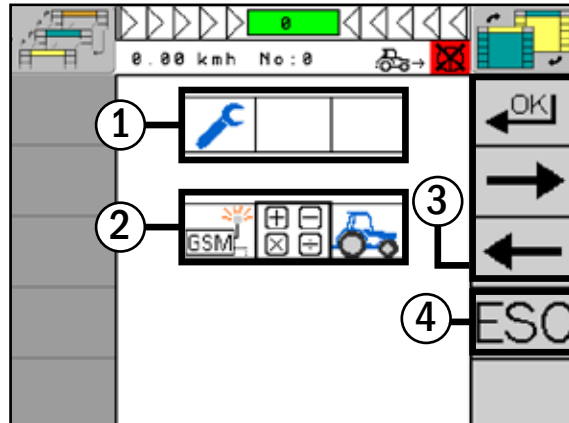


Fig. 38: Menu display

### 5.1.2 Numerical Input

Chapter 5.1.2 as well as the following Chapter 5.1.3 and Chapter 5.1.4 explain the basic functions in the menu of ULTRA GUIDANCE PSR ISO, which become necessary at different items of the menu.

The presented entry mask opens when the system requires numerical values for a setting. “Min” and “Max” define the possible range of values. Enter the desired value using the input keys of the ISOBUS terminal and confirm it with the enter key of the entry mask (see Fig. 39 – 1) or the “OK” function key (see Fig. 39 – 2).

#### NOTICE

Information on operation and entry of the numbers can be found in the operating instructions of your ISOBUS terminal.

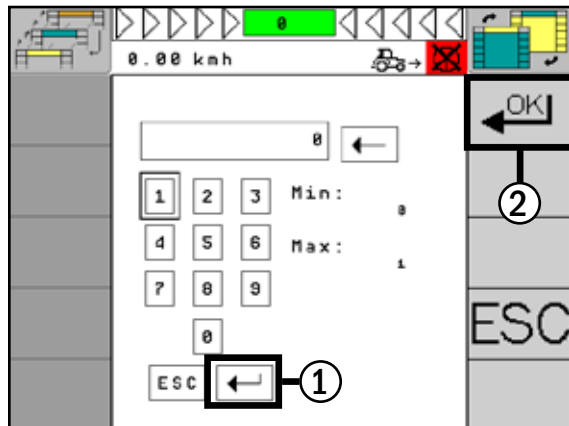


Fig. 39: Numerical input

### 5.1.3 Text Entry

The presented entry mask opens when the system requires a text input for a setting (e.g. field name). Enter the desired text using the input keys of the ISOBUS terminal and confirm it with the enter key of the entry mask (see Fig. 40 – 1) or the “OK” function key (see Fig. 40 – 2).



Fig. 40: Input via the text field

### 5.1.4 Save Changes

After changing the desired setting, you need to save these changes in the system (see Fig. 41).

Select the disk symbol and save the changes with “OK”.

Select “Do not save” using the crossed-out disk symbol to discard the change.

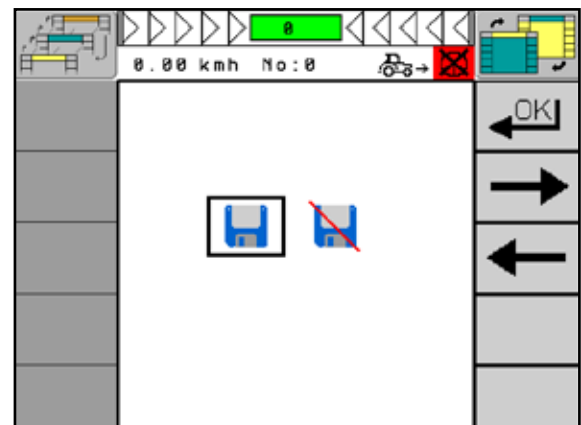


Fig. 41: Save changes

## 5.2 Call up Menu

Press the “Menu” function key (wrench) for approx. two seconds to get to the menu of ULTRA GUIDANCE PSR ISO (see Fig. 42).

The individual submenus of ULTRA GUIDANCE PSR ISO are described in the following chapters.

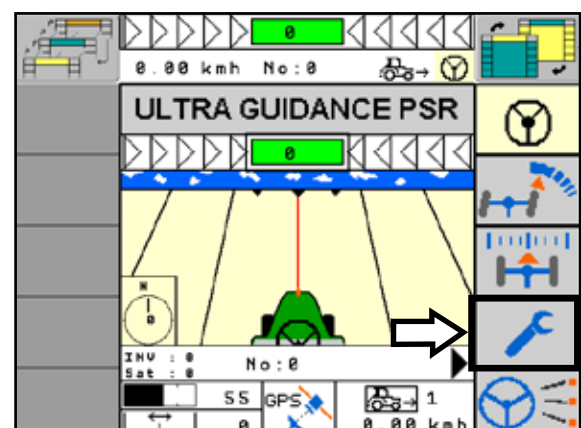


Fig. 42: Call up menu

### 5.2.1 Terminal Configuration

In the “Terminal configuration” menu, you can make the settings for your ISOBUS terminal when using ULTRA GUIDANCE PSR ISO.

Select “Terminal configuration” in the menu and confirm with “OK” (see Fig. 43).

The menu is clearly summarized on two pages. (see Fig. 44). With the selection key of your ISOBUS terminal, you can navigate through the menu page and make the relevant settings. By using the arrow keys, you get to the second page.

- a) Select “Use VT settings” if you wish to adopt the settings of the used terminal for ULTRA GUIDANCE PSR ISO (also see Fig. 44 – a).
- b) With the “Language” button, you can select the desired language. There are German (DE), English (EN), French (FR), Dutch (NL), Polish (PL), Romanian (RO), Spanish (ES) and Japanese (JP) available (see Fig. 44 – b).
- c) With the “Units” button, you select the unit you wish to use (metric or imperial) (see Fig. 44 – c).
- d) With the “Numerical Format” button, you can select the desired format (1.000,00 or 1,000.00) (see Fig. 44 – d).
- e) With the “Data Mask scaling” button, you make the screen settings of the PSR mask on your terminal. You can choose between centered and stretched (see Fig. 44 – e).
- f) With the “Volume” button, you can define the system volume of ULTRA GUIDANCE PSR ISO (see Fig. 44 – f).
- g) With the “Change VT” button (see Fig. 44 – g), the system shows the active as well as the available VTs.

If you want to change the VT, press the “Select” button, then select one of the available VTs with the arrow buttons and confirm your selection with “OK” (see Fig. 45).

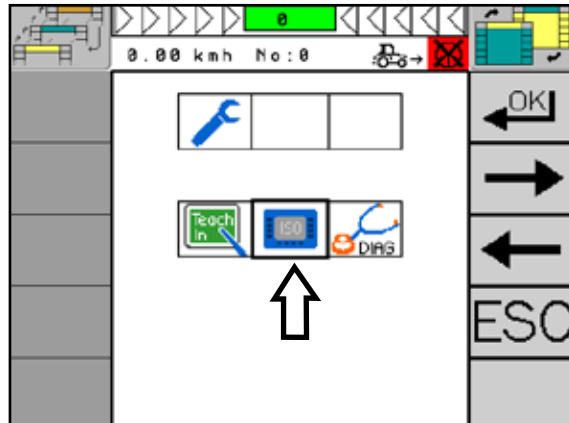


Fig. 43: Select terminal configuration

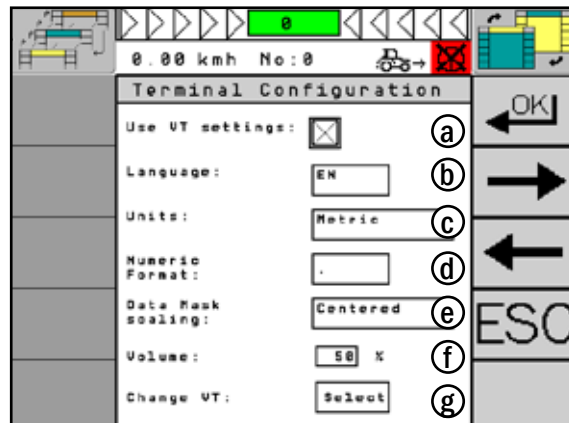


Fig. 44: Terminal configuration page 1

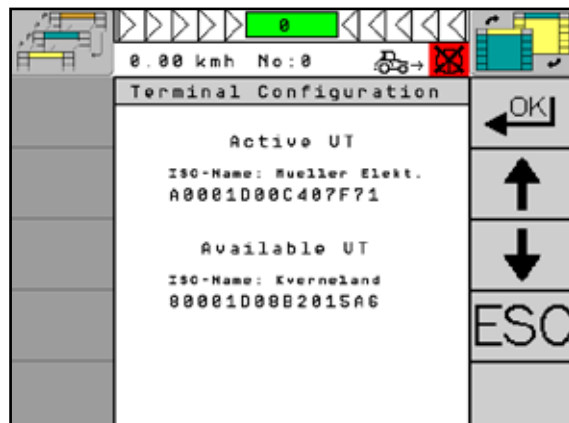


Fig. 45: Select VT

- h With the “VT use of” button, you can select with which CAN (CAN1 or CAN2) you want to use the VT (see Fig. 46 – h).

**NOTICE**

A selection between CAN1 and CAN2 is only possible if the messages are received on CAN2 and if this is permitted by the vehicle code.

- i With the “Time to wait for selected VT” button, you can set the time that ULTRA GUIDANCE PSR ISO will wait until the desired terminal has been started (see Fig. 46 – i). Select the button and enter the desired waiting time using the numerical input keys (see Fig. 47). Proceed as described in Chapter 5.1.2. Ten seconds are set in the system as default value.

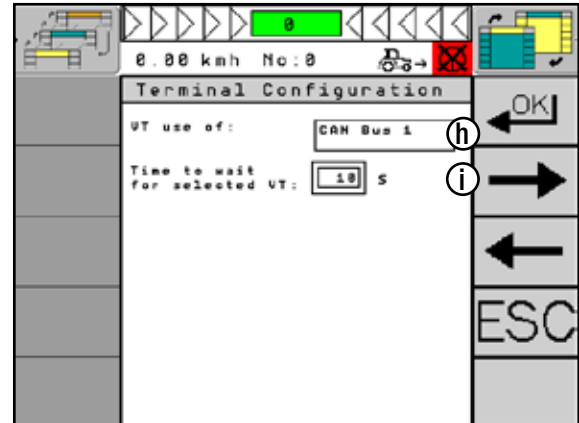


Fig. 46: Terminal configuration page 2

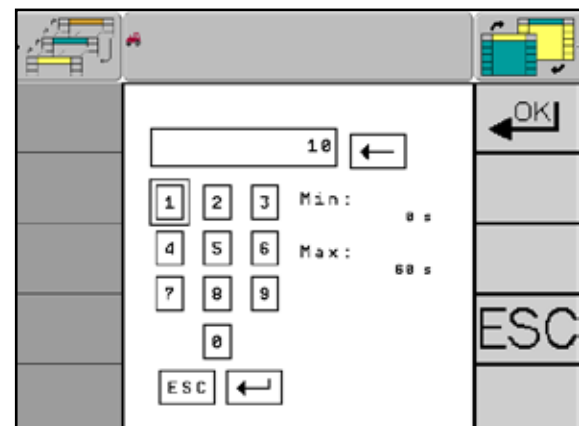


Fig. 47: Set waiting time

## 5.2.2 Set Vehicle Number

ULTRA GUIDANCE PSR ISO can save the settings of up to eight different vehicles. All vehicle settings are saved under one number. Each time the PSR iBox is installed in a new vehicle, the vehicle number is to be selected under which the vehicle has been saved.

Select "Vehicle number" in the menu and confirm with "OK" (see Fig. 48).

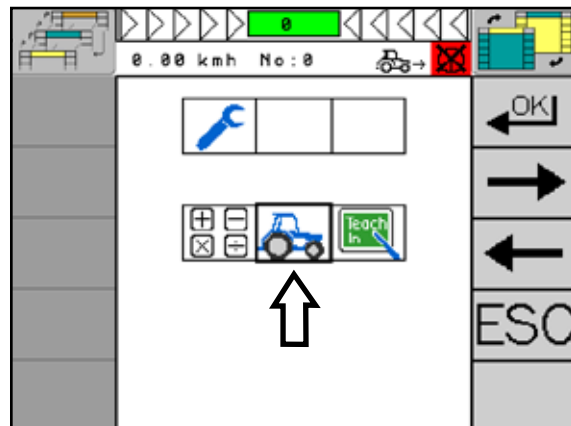


Fig. 48: Set vehicle number

Press the keys "right arrow/left arrow" to select the desired vehicle number (1-8). Confirm the selection with "OK" (see Fig. 49).

Save the changes in the system after selecting and confirming the vehicle number. Proceed as described in Chapter 5.1.4.

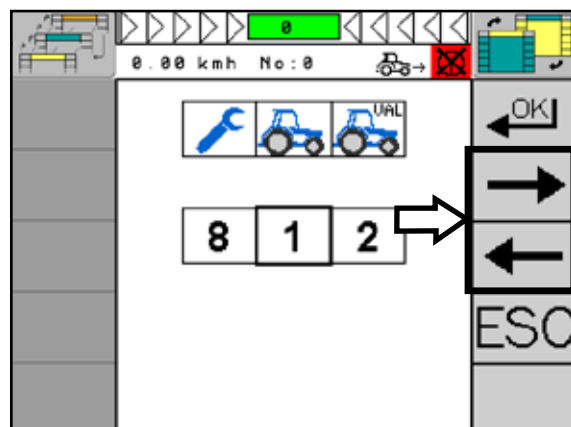


Fig. 49: Selection of vehicle number



### 5.2.3 Set GPS Receiver

The position information can be transmitted by using three different protocol types and/or interfaces:

- RS 232
- NMEA 2000
- J1939

Select “GPS” in the menu and confirm your selection with “OK” (see Fig. 50).

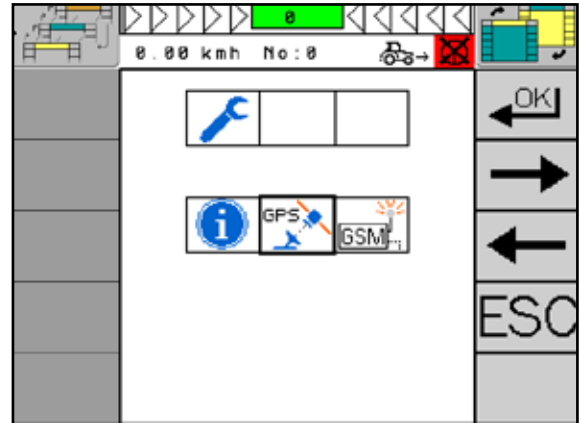


Fig. 50: Set GPS receiver

#### Set GPS Source

Set the GPS source from which position information shall be received by the system (see Fig. 51).

**NOTICE**

For further information, please refer to the data sheets of the relevant receivers.

Select the “GPS Source” button on your terminal and then the desired GPS source (see Fig. 51 and Fig. 52).

The settings of the three different GPS sources are set out in the following.

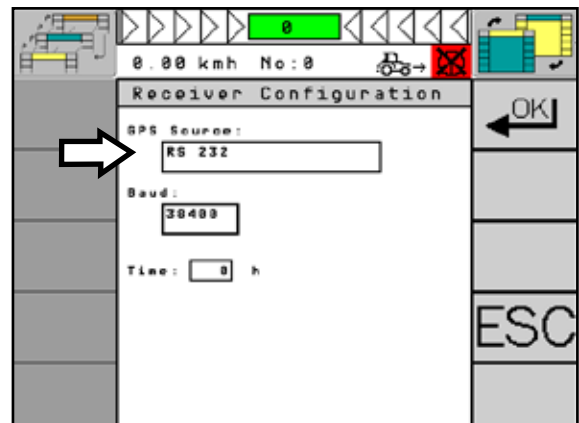


Fig. 51: Set GPS source

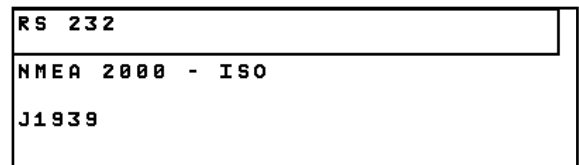


Fig. 52: Selection of GPS source

### 5.2.3.1 GPS Source RS 232

If GPS Source RS 232 is selected, please proceed as follows.

#### Set Port

The GPS receiver has three ports (“Port PSR”, “Port B” and “General”).

- “Port PSR” is the connection with the PSR steering system.
- “General” provides data on which DGPS receiver is used and if e.g. RTK is active.
- “Port B” provides serial receiver data. It is the second port of the receiver for other attachments or the communication with the modem.

Select “Setting” using the selection button of your terminal (see Fig. 53).

The settings for the use of both ports (Port B and General) are described at the end of the chapter (see “Using “Port B”” on page 38 and “Using the “General” Port” on page 38).

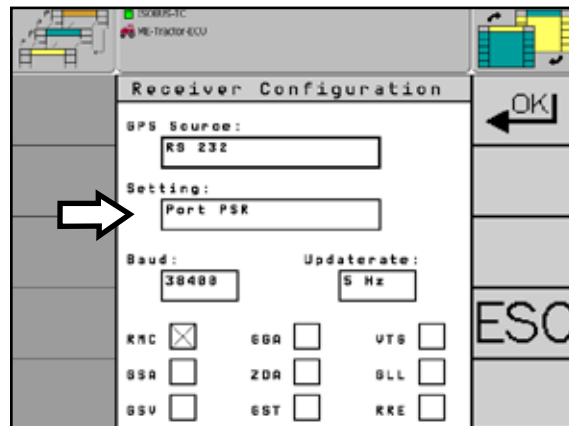


Fig. 53: Set port

#### Set Baud Rate

The baud rate is the transmission speed between ULTRA GUIDANCE PSR ISO and the GPS receiver.

Select the “Baud” button on the terminal (see Fig. 54).

Set the corresponding baud rate. For the use with ULTRA GUIDANCE PSR ISO, you need a baud rate of “38400” (see Fig. 55).

**NOTICE**

If the baud rate is not suitable, use the Autoscan function.

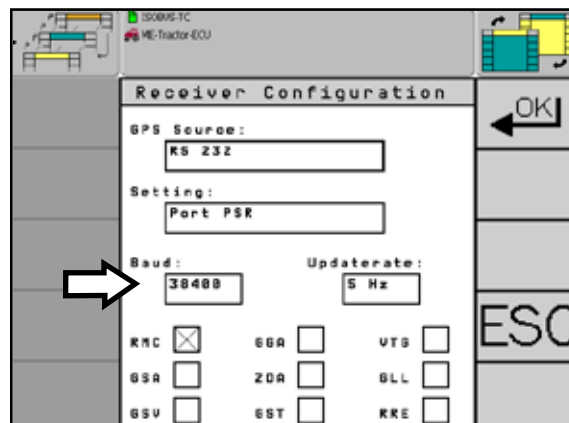


Fig. 54: Set baud rate

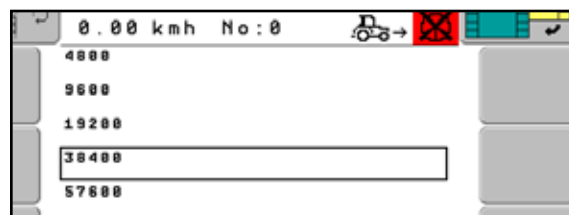


Fig. 55: Selection of baud rate

### Set Update Rate and Frequency Type

With the update rate, you can set the frequency with which all messages are transmitted.

Select the “Update rate” button on the terminal (see Fig. 56).

Set an update rate of 10Hz for the use of ULTRA GUIDANCE PSR ISO.

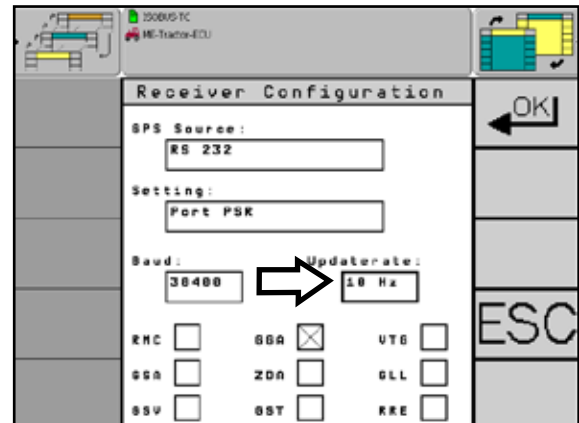


Fig. 56: Set update rate

Activate the message types “RMC” and “GGA”.

Select “RMC” and “GGA” using the checkboxes (see Fig. 57).

#### NOTICE

If you use a receiver of another manufacturer, you might need to set another update rate and frequency type. In this case you should contact your retailer or Reichhardt.

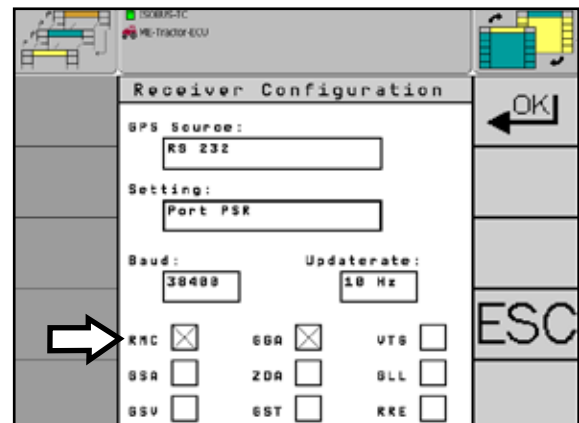


Fig. 57: Set frequency type

### GPS Follow-up Time

The set follow-up time defines for how long the GPS receiver will be supplied with voltage during a break.

#### NOTICE

During a break, the GPS receiver shall always have a clear view of the sky.

Select “Time” and set the desired follow-up time (see Fig. 58). Proceed as described in Chapter 5.1.2.

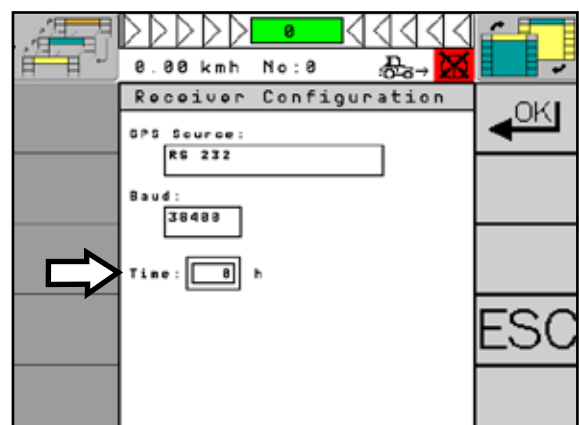


Fig. 58: Set follow-up time

### Using “Port B”

If you have selected “Port B” as described in section “Set Port” on page 36 (see Fig. 59 – 1), the settings will deviate.

Set the parameters as described in the following (see Fig. 59).

Set a baud rate of 19200 (see Fig. 59 – 2).

Set an update rate of 1Hz (see Fig. 59 – 3).

Activate message type GGA. Select “GGA” using the checkbox (see Fig. 59 – 4).

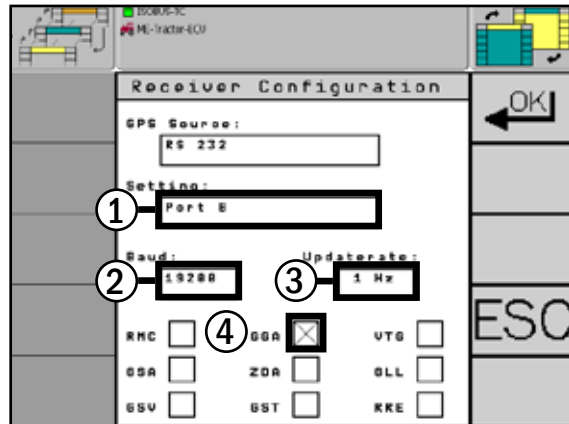


Fig. 59: Using port B

### Using the “General” Port

If you have selected “General” port as described in section “Set Port” on page 36 (see Fig. 60 – 1), the settings will deviate.

Set the parameters as described in the following (see Fig. 60).

Set PRN (Priority Number – satellite providing the data) to “120-EGNOS” (Europe) (see Fig. 60 – 2).

Set “NP” (number of decimal places of the received correction data) to the default value 7 (see Fig. 60 – 3).

Set “APPL” (application) to “WAAS” (see Fig. 60 – 4).

Set “Diff” (correction source) to “WAAS” as well (see Fig. 60 – 5).

Select “Time” and set the follow-up time of the GPS receiver after switching off the system to the desired value (see Fig. 60 – 6).

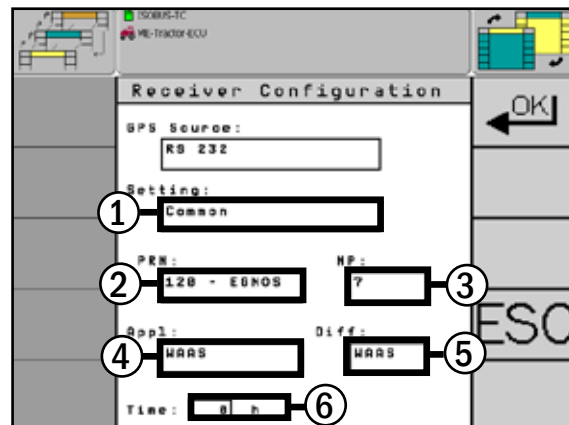


Fig. 60: Using the general port

### 5.2.3.2 GPS Source NMEA 2000

If GPS source NMEA 2000 is selected, please proceed as follows.

In the top line, the active “Nav Controller” will be displayed (see Fig. 61 – 1). Nav Controller designates the navigation element, in the figure the used VT.

In the second line, all available “Nav Controllers” will be displayed (see Fig. 61 – 2). With the “Next” button (see Fig. 61 – 3), you go to the next available Nav Controller, with “Select” (see Fig. 61 – 4), you select it.

Select “Time” and set the follow-up time of the receiver after switching off the system to the desired value (see Fig. 61 – 5).

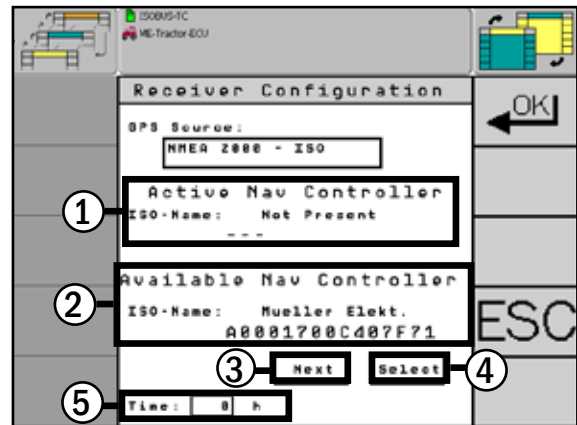


Fig. 61: Settings for GPS source NMEA 2000

### 5.2.3.3 GPS Source J 1939

If GPS source J 1939 is selected, you proceed in the same way as with GPS source NMEA 2000 (cf. Chapter 5.2.3.2) (see Fig. 62).

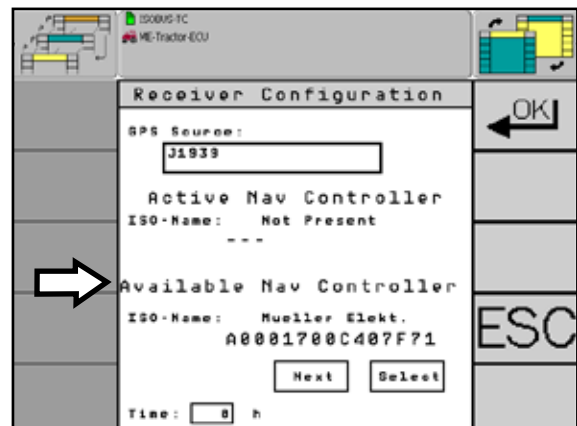


Fig. 62: Settings for GPS source J 1939

## 5.2.4 Modem Configuration

Via ULTRA GUIDANCE PSR ISO, you can configure the RTK CLUE modem directly.

Select “GSM” in the menu and confirm with “OK” (see Fig. 63).

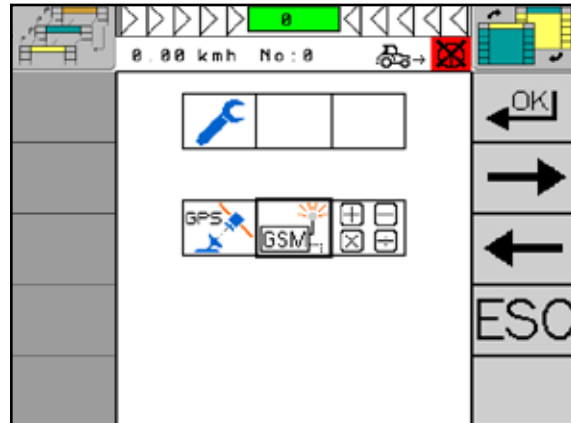


Fig. 63: Call up modem configuration

Press the “Connect” button to activate the modem (see Fig. 64). Make sure that ULTRA GUIDANCE PSR ISO is switched on and that the modem is connected with the system.

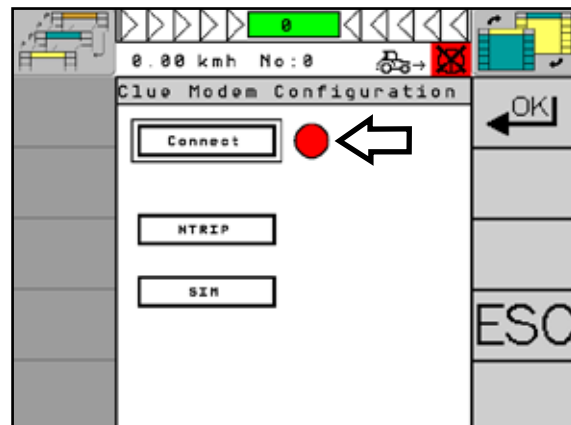


Fig. 64: Connect modem

If the modem is active, this will be visualized by a green signal (see Fig. 65).

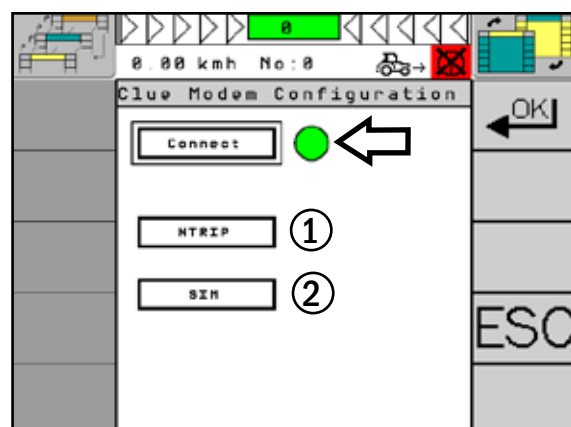


Fig. 65: Modem connected

When a connection with the modem is established, the NTRIP data are downloaded from the modem and displayed in the NTRIP configuration.

Select the single buttons, if you wish to change the loaded data (see Fig. 66).

The screenshot shows the 'NTRIP Configuration' screen. At the top, there's a status bar with '0.00 kmh No: 0' and a green battery icon. Below the title bar, there are five input fields: 'Server Address' with 'rtk-clue.net', 'Server Port' with '2101', 'User name' with 'Krott2', 'Password' with 'test', and 'Mountpoint' with 'RTN01'. To the right of the fields are three large buttons: 'OK' (with a left arrow), 'ESC' (with a right arrow), and a central button with a tractor icon and a red 'X'.

Fig. 66: NTRIP configuration

When a connection with the modem is established, the SIM data are downloaded from the modem and displayed in the SIM configuration.

Select the single buttons to change the loaded data (see Fig. 67).

The screenshot shows the 'SIM Configuration' screen. At the top, there's a status bar with '0.00 kmh No: 0' and a green battery icon. Below the title bar, there are four input fields: 'Provider List' with 'T-Mobile DE', 'APN' with 'internet.t-mobile', 'APN Name' with 'tm', and 'APN Password' with 'tm'. To the right of the fields are three large buttons: 'OK' (with a left arrow), 'ESC' (with a right arrow), and a central button with a tractor icon and a red 'X'.

Fig. 67: SIM configuration

## 5.2.5 Calculator

ULTRA GUIDANCE PSR ISO has a calculator function.

Select “Calculator” in the menu and confirm your selection with “OK” (see Fig. 68)

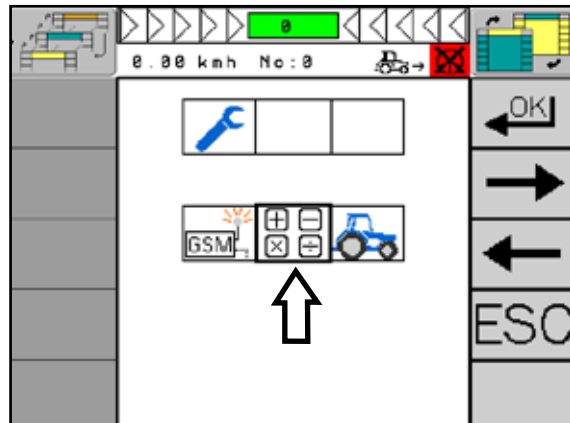


Fig. 68: Call up calculator

You can use the calculator function via the entry mask (see Fig. 69).

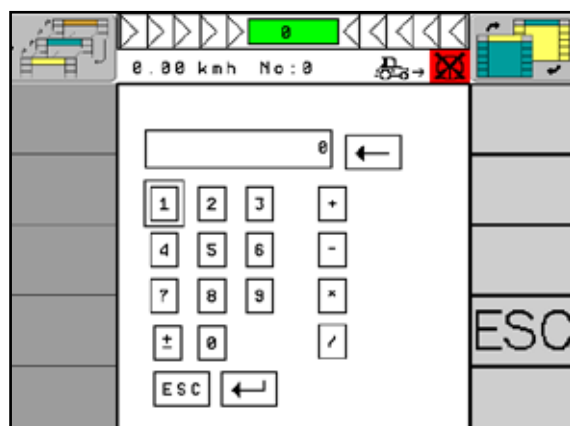


Fig. 69: Use calculator



## 5.2.6 Teach-In Menu

In the “Teach-In” menu, you can set the desired speed source, teach the position sensor as well as the joystick and set the CAN which will be used for steering. In addition, you can activate and deactivate the TRACK-LEADER TOP mask.

Select “Teach-In” in the menu and confirm your selection with “OK” (see Fig. 70).

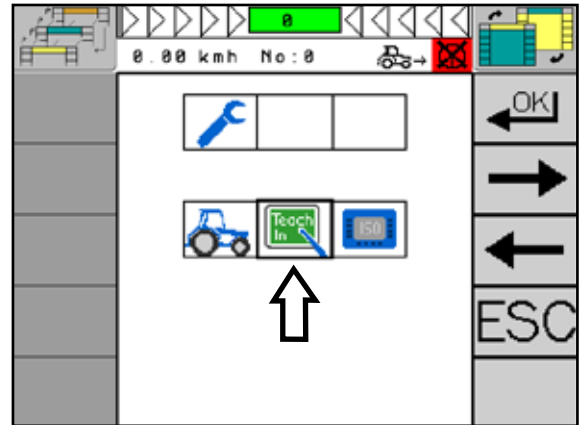


Fig. 70: Teach-in menu

Structure of the Teach-In Menu (see Fig. 71):

- Ⓐ Setting of the speed source
- Ⓑ Setting the position sensor
- Ⓒ Activate/deactivate TRACK-LEADER-TOP
- Ⓓ Teach joystick
- Ⓔ Selection CAN 1/2

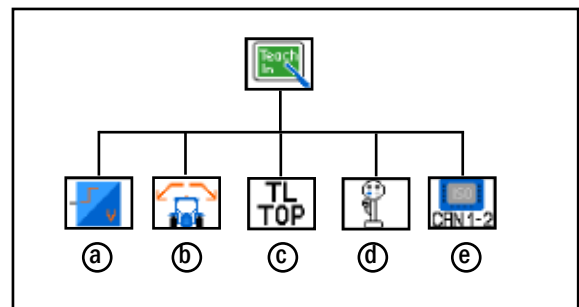


Fig. 71: Teach-in menu structure

**NOTICE**

The display of the teach-in menu and the individual submenus depends on the previous entries in the system. The figures in these instructions may thus deviate from the information displayed on the terminal.

### 5.2.6.1 Vehicle Speed

In order that ULTRA GUIDANCE PSR ISO can take over the automatic steering, it must obtain information on the speed of the vehicle. The vehicle can be steered automatically from a speed of 0.03km/h (98.5ft/h), depending on system and activation.

The speed can be captured in seven different ways:

- Incremental encoder
- GPS receiver
- ISOBUS 11783 GBSD
- ISOBUS 11783 WBSD
- Special (vehicle-specific)
- NMEA 2000
- J1939 CCVS1

Select the “Vehicle Speed” submenu and confirm your selection with “OK” (see Fig. 72).

The structure of the called menu depends on the current presetting. If an incremental encoder is set as speed source, the menu will look as shown in Fig. 73.

If one of the other sources (“GPS receiver”, “Special” or “ISOBUS 11783”) is selected, you will directly enter the submenu for the selection of the speed source (see Fig. 74).

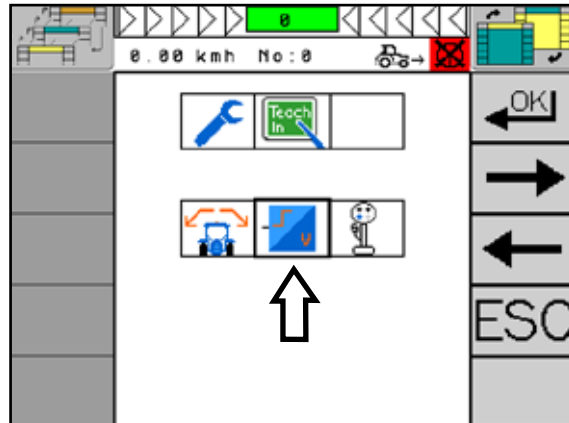


Fig. 72: Call up submenu vehicle speed

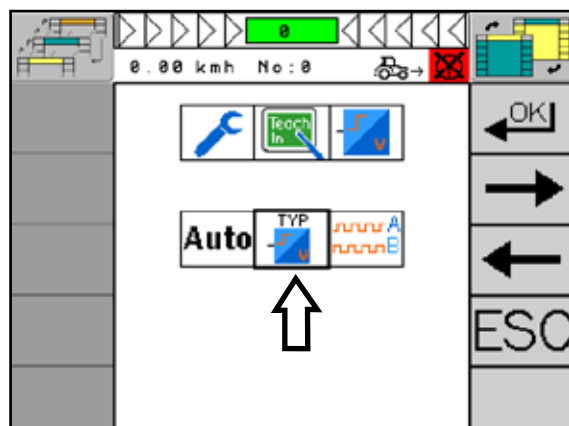


Fig. 73: Set vehicle speed

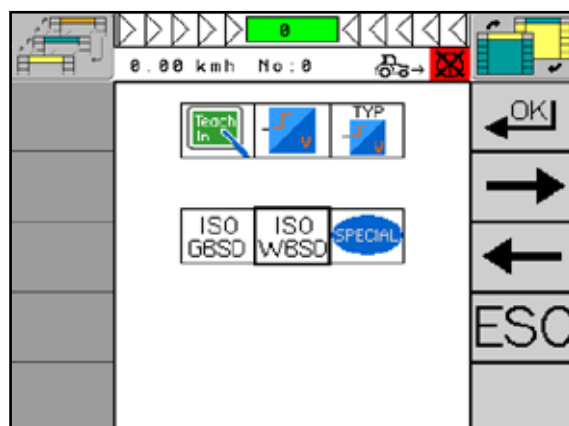


Fig. 74: Selection of speed source

### Selection of the Speed Source

In the “Speed source” submenu, you can select the signal which captures the speed.

If an incremental encoder is preset as the source, select “Type” in the menu and confirm your selection with “OK” (see Fig. 73).

The following speed sources are available in the menu:



#### **Incremental encoder**

Speed pulses from the vehicle/radar sensor



#### **GPS**

Speed signal from the GPS receiver via RS 232.



#### **ISO GBSD**

ISOBUS 11783 message Ground Based Speed: This speed source is measured on the ground, e.g. with a radar sensor.



#### **ISO WBSD**

ISOBUS 11783 message Wheel Based Speed: This speed corresponds to the speed of the wheel including slip.



#### **Special**

Vehicle-specific speed message.



#### **NMEA 2000**

Speed from the GPS receiver via NMEA 2000.



#### **J1939 CCVS1**

Speed from the vehicle via J1939.

Select the desired setting and confirm your selection with “OK”. Save your setting as described in Chapter 5.1.4.

For any other preset speed source, you get directly to the speed source selection when entering the menu for setting the vehicle speed (see Fig. 75).

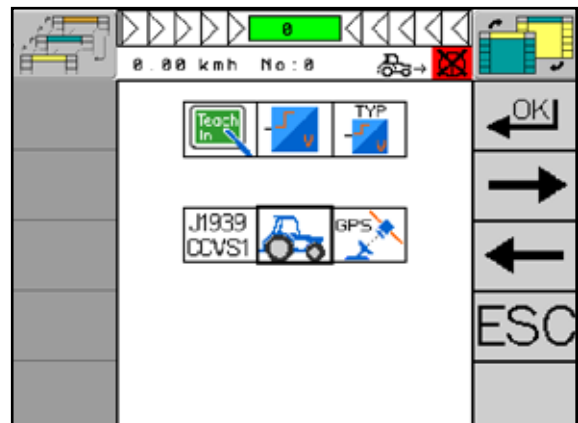


Fig. 75: Set speed source

### Using an Incremental Encoder as Speed Source

If an incremental encoder is defined as speed source, the subitems “Type speed sensor”, “Incremental” and “Auto” will appear in the menu for setting the vehicle speed. These are characterized by the following symbols:



#### Type Speed Sensor

Selection of the speed sources



#### Incremental – Manual Entry of the Speed Increments

Set speed pulses manually



#### Auto

Set speed pulses automatically

### Automatic Speed Calibration

In order to automatically calibrate speed pulses from the incremental encoder, you need to drive a distance of exactly 100m (330ft).

Select “Auto” in the menu and confirm your selection with “OK” (see Fig. 76).

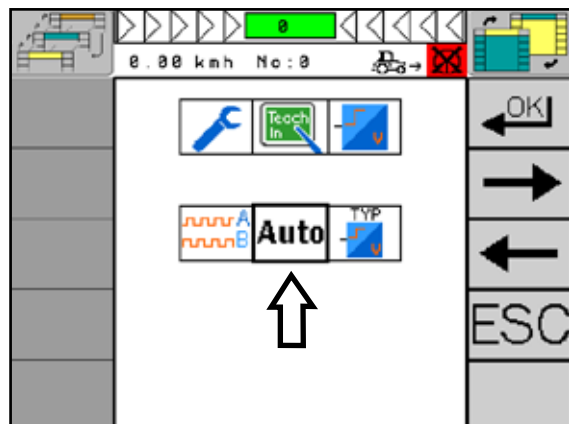


Fig. 76: Automatic speed calibration

Select “Start” in the menu and confirm your selection with “OK” (see Fig. 77).

Now drive a distance of exactly 100m (330ft).

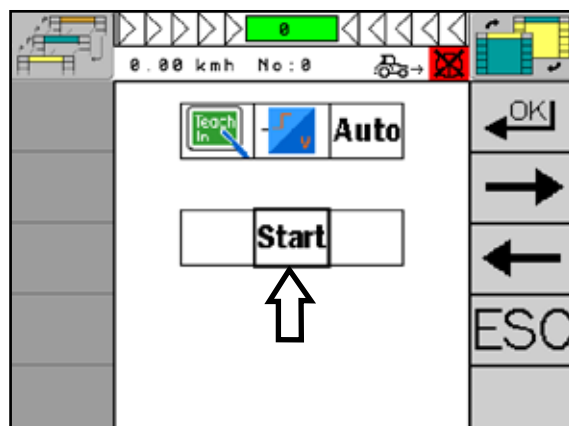


Fig. 77: Confirm selection

Select “Stop” in the menu and confirm your selection with “OK” (see Fig. 78).

Confirm your speed detection with “OK” and save it as described in Chapter 5.1.4.

**NOTICE**

Check the teached speed calibration in the “Incremental – manual entry of the speed increments” menu and manually correct the speed calibration if required.

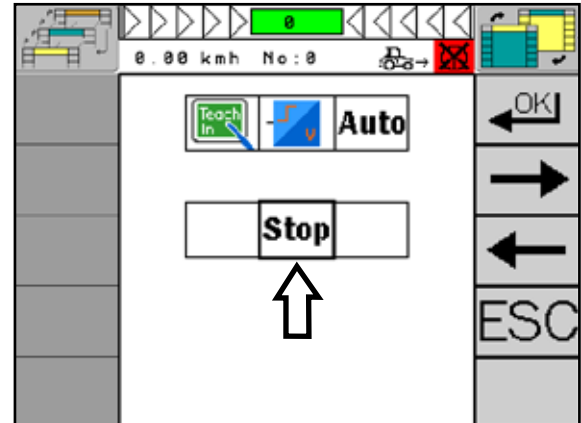


Fig. 78: Confirm selection

**Manual Speed Entry**

Select “Incremental – manual entry of the speed increments” and confirm your selection with “OK” to set the speed (see Fig. 79).

Set the differential speed between ULTRA GUIDANCE PSR ISO and tractor meter in such a way that they correspond.

Set the speed increments using the “plus and minus key” (see Fig. 80). Alternatively, you can enter the values manually. Proceed as described in Chapter 5.1.2.

**NOTICE**

Drive the vehicle as constantly as possible at a speed of 5km/h (3.1mph) in order to check the set speed increments. Compare the driving speed of the vehicle with the displayed speed. If the displayed speed is too high, you need to increase the speed increments. If the displayed speed is too low, you need to decrease the speed increments.

Check at different driving speeds.

Confirm your entry with “OK” and save it as described in Chapter 5.1.4.

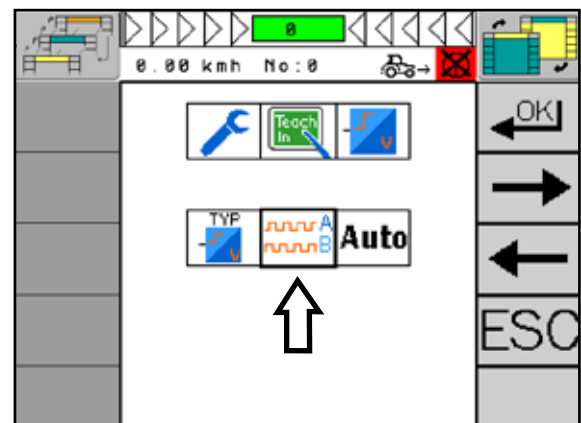


Fig. 79: Manual speed entry

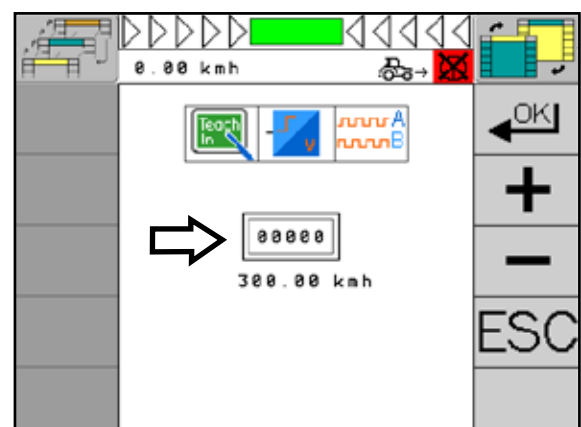


Fig. 80: Set speed pulses

### 5.2.6.2 Setting the Position Sensor

The position sensor of the ULTRA GUIDANCE PSR ISO steering system enables an automatic slope compensation.

In the menu for teaching the position sensor, you can calibrate the position sensor, switch it on and off, and select different position sensors.

Select the “Setting the position sensor” submenu and confirm your selection with “OK” (see Fig. 81).

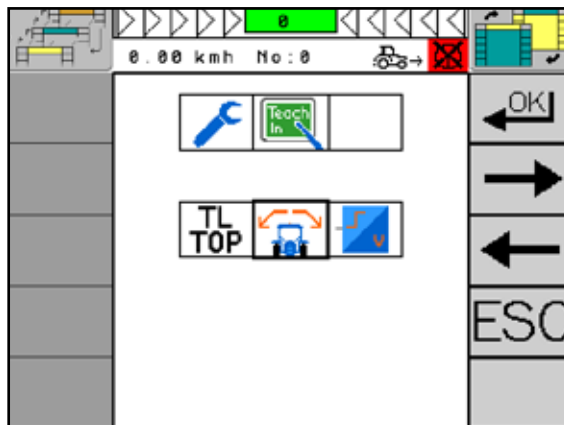


Fig. 81: Teach position sensor

#### Select Sensor Type

The first menu item “Sensor Type” (see Fig. 82) indicates if an external sensor or an internal tilt module is used. The type depends on the used PSR iBox. A selection is only possible if the PSR iBox LT is used with an integrated tilt module. The tilt module designates the combination of tilt (slope sensor) and gyroscope. For all other versions, an “external” sensor is selected. When using an iBox MC, an “internal” sensor is always selected. Select accordingly using the button (see Fig. 83).

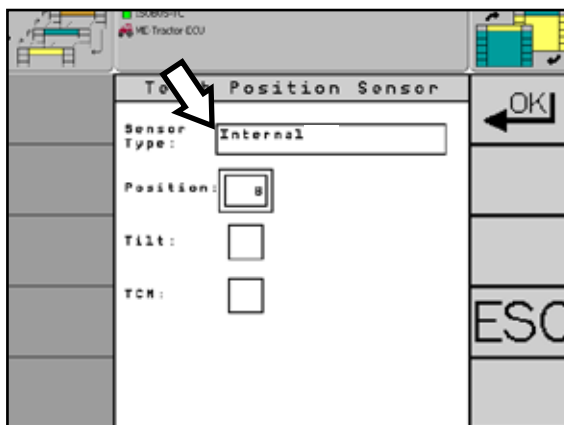


Fig. 82: Sensor type

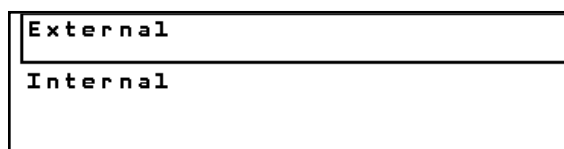


Fig. 83: Selection of sensor type

Select the “Tilt” checkbox to switch the position sensor on and off (see Fig. 84).

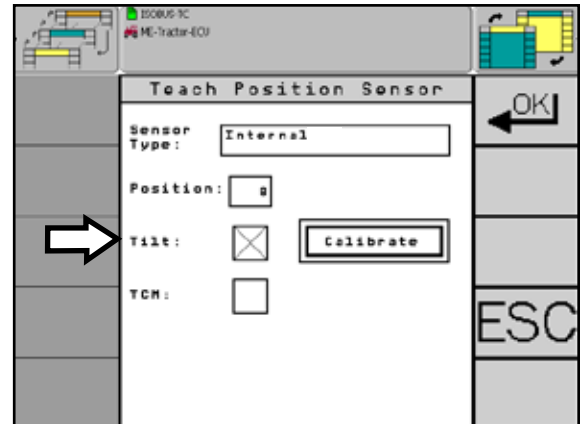


Fig. 84: Activate/deactivate position sensor

If you use a GPS receiver with an integrated position sensor and you wish to use its slope compensation, you need to select the “TCM” checkbox. If the sensor mode is active, only the internal position sensor will be used (see Fig. 85).

**NOTICE**

Please also read the explanations and notes in the “Calibrate position sensor”.

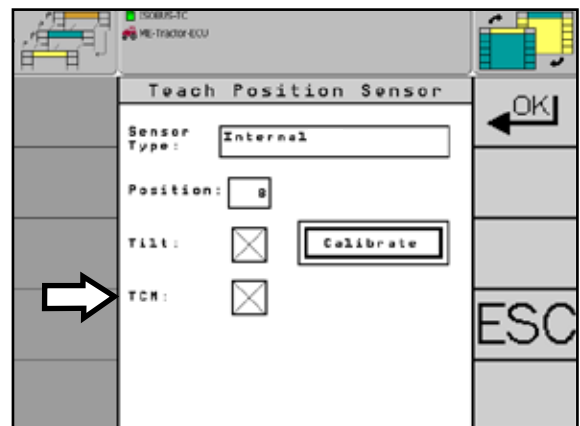


Fig. 85: Activate/deactivate TCM

**Calibrate Position Sensor**

Select “Calibrate” and follow the next menu steps to set the position sensor (see Fig. 86).

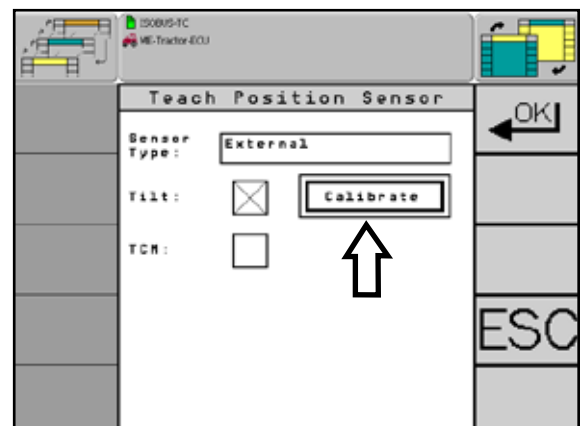


Fig. 86: Calibrate slope sensor

The display shows a tractor and a flag with the number “1” (see Fig. 87).

Position the vehicle and let it settle.

**NOTICE**

The vehicle must not be moved in any way during the following capture of the vehicle position. Otherwise, the setting values could be falsified.

Confirm the vehicle position with “OK”. The first step is thereby complete.

**NOTICE**

The vehicle position will only be captured at exactly 0km/h (0mph) and when the point is illuminated in green (see Fig. 87 – 1 and 2).

After completion of the first step, the menu automatically switches to the second step.

The display now shows the tractor in the reversed direction and a flag with the number “2” (see Fig. 88).

Do not press any button!

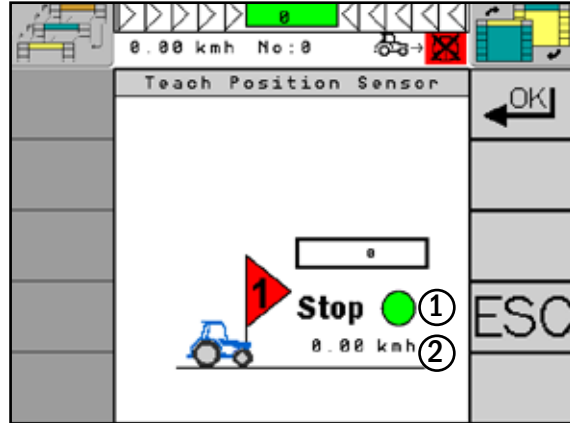


Fig. 87: Position machine and confirm position

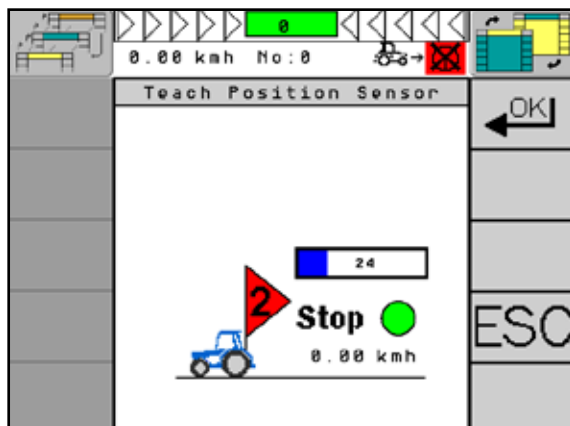


Fig. 88: Calibration step 2

Get out of the vehicle and mark the position of the rear wheels on the ground (see Fig. 89).

Turn the vehicle by 180° and position it with the front wheels exactly on the previously marked wheel positions (see Fig. 90).

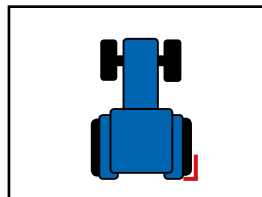


Fig. 89: Position of the rear wheels

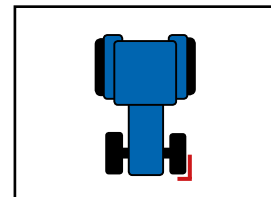


Fig. 90: Position of the front wheels

**NOTICE**

The vehicle must not be moved in any way during the following capture of the vehicle position. Otherwise, the setting values could be falsified.

The position data should be captured on a level surface. The load of the vehicle must also not be changed during the process, i.e. no co-driver.

When there is a change in air pressure of the tire, a recalibration must be carried out.

Confirm the new vehicle position by pressing “OK”. After the confirmation, the menu will automatically prompt you to save the position. Save the settings, proceed as described in Chapter 5.1.4.



### 5.2.6.3 Activate/deactivate TRACK-LEADER TOP

TRACK-LEADER TOP enables you to extend the scope of functions of ULTRA GUIDANCE PSR ISO. Select the "TL TOP" submenu and confirm your selection with "OK" (see Fig. 91).

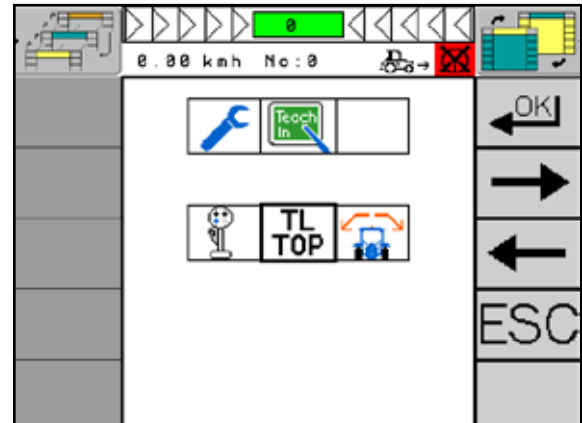


Fig. 91: TRACK-LEADER TOP

Select "ON" or "OFF" in order to switch TRACK-LEADER TOP on or off (see Fig. 92).

After the selection, press the "OK" key and save the settings, proceed as described in Chapter 5.1.4.

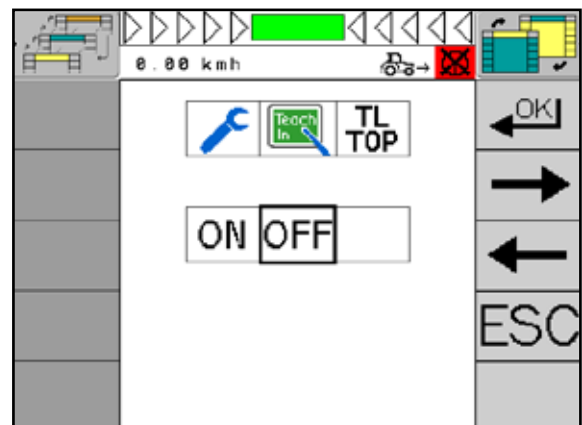


Fig. 92: Activate/deactivate TRACK-LEADER-TOP

### 5.2.6.4 Adjust the Joystick

By using the joystick, you can activate/deactivate functions, switch between functions and control the vehicle in the manual mode.

Select “Joystick” and confirm your selection with “OK” (see Fig. 93).

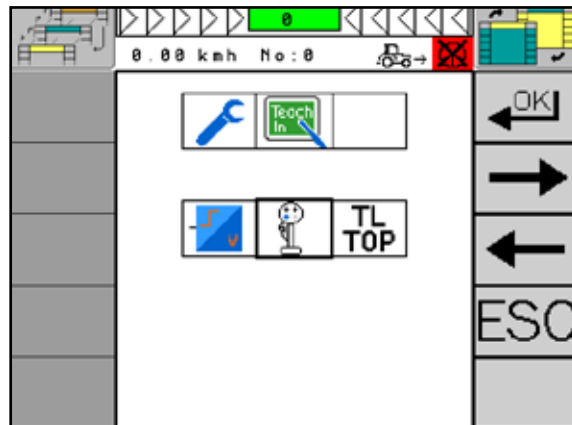


Fig. 93: Teach joystick

#### Switching the Joystick on/off

Select the “Enable joystick” checkbox to switch on the joystick (see Fig. 94).

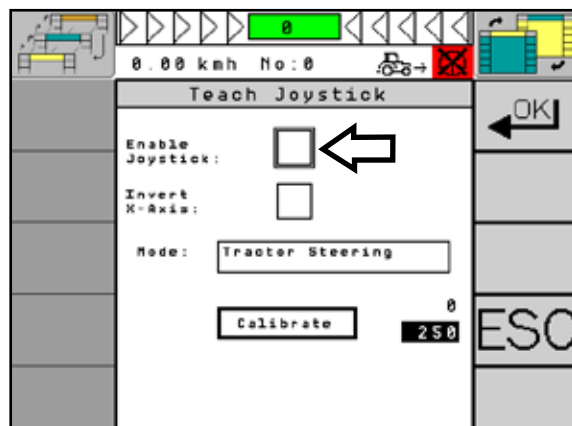


Fig. 94: Switch joystick on/off

### Adjust the Control Direction

Select the “Invert X-Axis” checkbox if you wish to change the direction of the x-axis of the joystick. When the “Invert X-Axis” function is active, the vehicle will steer to the left when you steer to the right using the joystick (see Fig. 95).

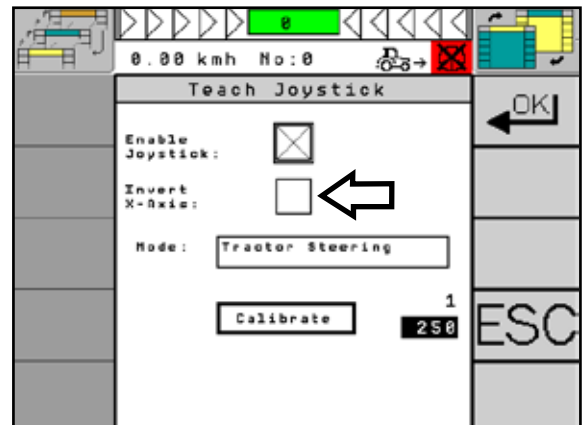


Fig. 95: Switch direction of the x-axis

Under the menu item “Mode”, you can select between two modes (“tractor steering” or “implement steering”) (see Fig. 96).

In the “Tractor steering” mode, you can switch the automatic steering on and off (with dead-man switch).

In the “Implement steering” mode, you can switch between automatic steering and “Steer by wire” as well as set the distance via “Nudging”.

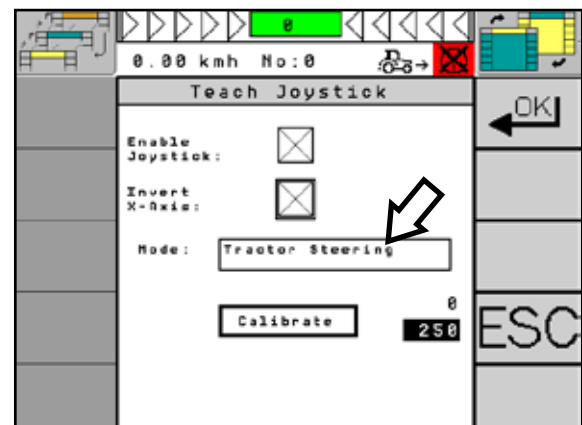


Fig. 96: Tractor or attachment mode

After making the settings, calibrate the joystick using the button of the same name. The system will adopt the current values (see Fig. 97).

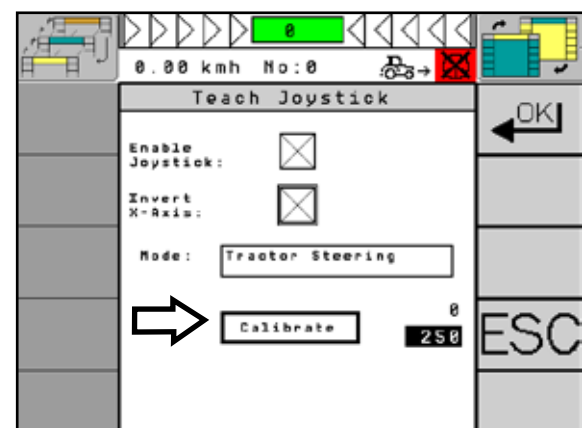


Fig. 97: Calibrate joystick

### 5.2.6.5 Changing CAN 1 and CAN 2

If there are ISO VTs connected to CAN1 as well as to CAN2, you can set which CAN bus you wish to use.

Select “CAN 1-2” in the menu and confirm your selection with “OK” (see Fig. 98).

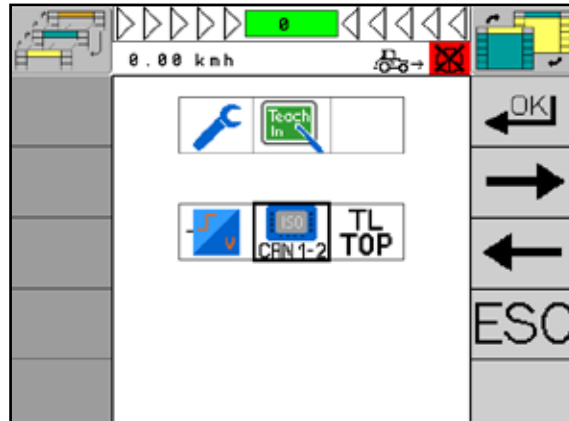


Fig. 98: Select CAN bus setting

Select “1” or “2” in the menu and confirm your selection with “OK” (see Fig. 99).

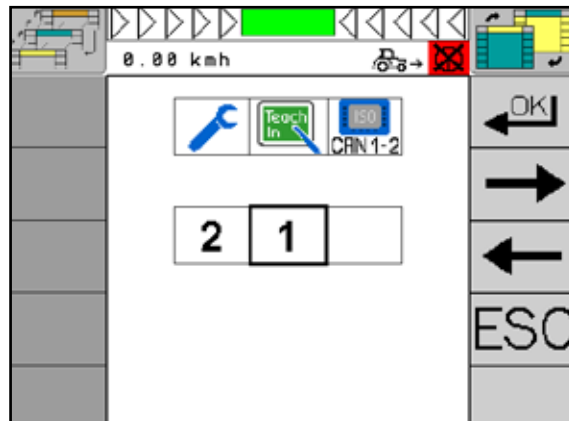


Fig. 99: Select CAN 1 or CAN 2

## 5.2.7 Diagnosis

The diagnosis program provides you with an overview of the current state of the system. Additionally, it supports you in locating malfunctions.

**NOTICE**

In order to prevent possible problems with electrical connections, you need to check all inputs for their function after each change of the controller PSR to another vehicle.

Select “Diagnosis” in the menu and confirm your selection with “OK” (see Fig. 100).

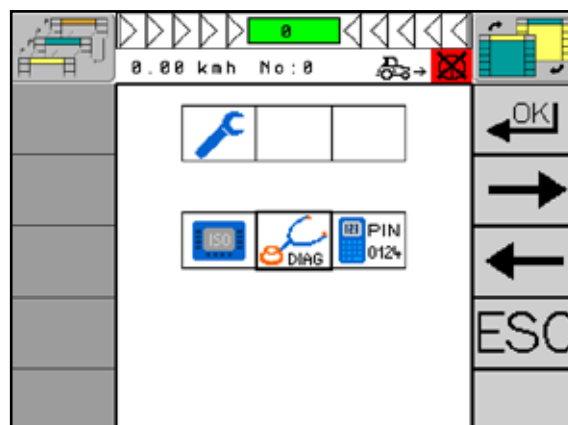


Fig. 100: Diagnosis menu

### 5.2.7.1 Vehicle Diagnosis

Select “Read out sensors” in the menu and confirm your selection with “OK” (see Fig. 101).

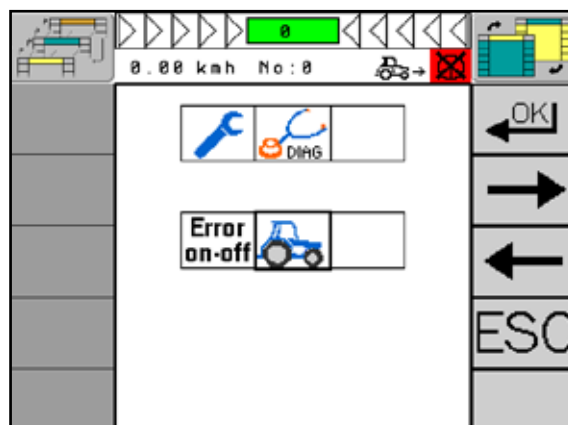


Fig. 101: Vehicle diagnosis

The field on the right side of the top line in the menu structure shows the selected sensor type. The values of the selected sensor will be displayed underneath the menu structure (see Fig. 102).

Press the “arrow keys right/left” to switch between the different sensor types.

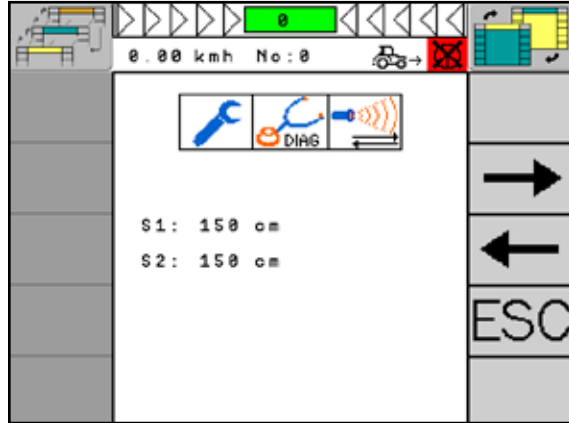


Fig. 102: Select sensor types

#### Overview of the Sensor Types and their Values



##### Ultrasound

The menu shows the distances of the ultrasound sensors to the measurement object in two steps (S1-S2 and S3-S4), as far as these are connected with the front socket.

If the sensors are not connected with the front socket, incorrectly set or defective, the value “150cm” (236 ¼inch) will be displayed.



##### TAC Sensor

The menu shows the current values of the sensors (S1/S2 and/or S3/S4, depending on the version). If the plastic scanner is in its resting position, a value around 50 must be displayed. During movement, the value must not exceed 500.

Please contact your retailer in case of values below 40 or exceeding 500, and also if the value of the scanner does not change during movement.



##### MEC (Mechanical Row Scanner)

The menu displays the value for the current position of the receiver tool of the scanner. When moving the receiver tool, the value increases or decreases accordingly.



##### Gyroscope

When driving straight ahead, the data rate (“Yaw”) should be approx. 0. If you steer to the right side, the value will be positive, if you steer to the left, the value will be negative.



##### Slope Sensor

On a level ground, the slope value (“Roll”) should be approx. 0.



##### Safety Switch

The status of the safety switch will be displayed. When opening or confirming the seat contact switch, the value will be changed from 0 to 1 or reversed.



##### Foot Switch

Display of the status of the foot switch.

- 0 = switch not actuated
- 1 = switch actuated



### Wheel Angle Sensor

The menu displays the value of the current axis position. When changing the axis position, the value increases or decreases accordingly.



**WARNING** Danger of accidents and injuries due to uncontrolled steering.

When the steering wheel is turned and the steered axle moves, but the displayed value does not change, there is a risk of accidents and severe injuries. Immediately stop the operation of the system and contact your authorized service partner.



### Pressure Sensor

The displayed value should change when the steering wheel is turned.



### RDU Pulse Counter of the Steering Wheel Motor

When the friction wheel is turned manually, both values S1 and S2 must continuously change.



### Speed

Display of the current vehicle speed



### GPS

The current values for the GPS reception are displayed in several menus.

- The values for “Lon” and “Lat” are the coordinates of the GPA receiver. They should continuously change when driving. When the machine is at standstill, the values may slowly change only from the third decimal place. Greater changes indicate a substantial satellite drift.
- Display of the update data, the messages issued by the GPS receiver.
- GPS receiver type
- Heading: Display of the driven cardinal direction.
- Sat: Number of the currently received satellites.
- Quality: Signal quality of the GPS receiver.
- HDOP: Accuracy of the position. The higher the value, the worse is the accuracy of the position.
- REF ID: ID of the used reference signal.
- REF AGE: Age of the correction data.
- Date and time: The information correspond to GPS time, not the local time.



### Vehicle Data

Display of the operating hours and kilometers/miles driven with automatic steering. The value indicated under “Code” is required for service requests.



### Control Type

Display of the control type.



### System Information

Different values such as voltage, baud rate and CPU load as well as an error status for the internal CPU are displayed.

### 5.2.7.2 Read out Error Memory

All errors occurred in the steering system are recorded in the error memory. These information can be used for diagnostic purposes.

Select “Error on-off” in the diagnosis menu and confirm your selection with “OK” (see Fig. 103).

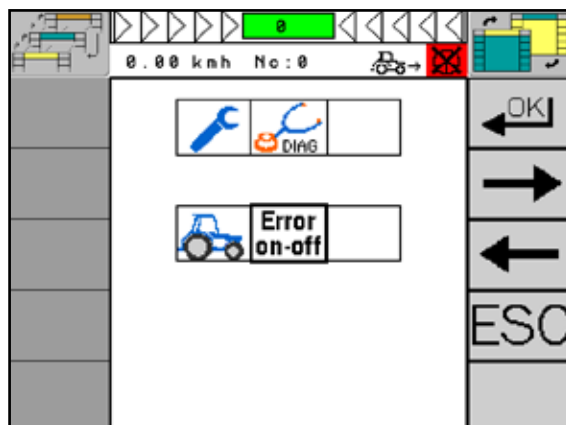


Fig. 103: Read out error memory

The error memory will be displayed (see Fig. 104).

Use the “arrow buttons up/down” to navigate through the occurred errors.

 The screenshot shows the 'Error History' table. The table has four columns: 'Code', 'Number', 'Date', and 'Date'. There are three rows of error data. To the right of the table, there are three large buttons: an up arrow, a down arrow, and 'ESC'.
 

	Code	Number	Date	Date
1	1000 0 0	37	09.10 2016	27.04 2017
2	1040 0 0	43	09.10 2016	27.04 2017
3	5103 0 0	1	09.10 2016	00.00 2000

Fig. 104: Error list in the error memory



## 5.2.8 System Information

Under “system information” you can find information about the used PSR iBox with software version and serial number, the version of the ISO mask, the lib modules, the gilt module and the responsible service partner.

Select “System Information” and confirm your selection with “OK” (see Fig. 105).

By pressing the “arrow keys up/down”, you get to the next information page (also see Fig. 105).

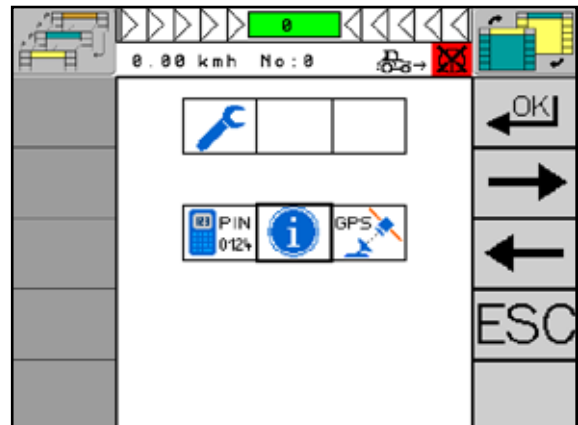


Fig. 105: System information

Display of information on the PSR iBox (software version, service number and software status) (see Fig. 106).



Fig. 106: PSR iBox

Display of information regarding the ISO VT mask (see Fig. 107).



Fig. 107: ISO VT mask

Display of information regarding the ISO VT mask (see Fig. 108).



Fig. 108: Lib modules

Display of information regarding the gilt module (see Fig. 109).



Fig. 109: Gilt module

Display of information regarding your service partner (see Fig. 110).



Fig. 110: Service partner

## 6 PSR SKY

The PSR SKY operation mode is satellite-supported steering with high precision. Different GPS modes offer a wide range of applications.

### 6.1 Menu Structure

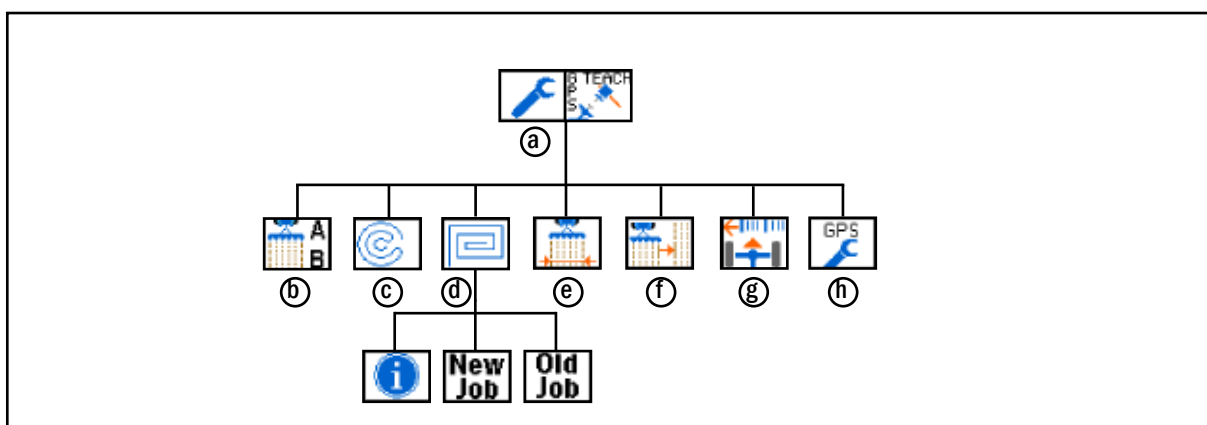


Fig. 111: Menu structure

- |                       |                           |
|-----------------------|---------------------------|
| (a) Main menu PSR SKY | (e) Set working width     |
| (b) A-B line          | (f) Set the device offset |
| (c) Circles           | (g) Set nudging           |
| (d) Multi-line        | (h) GPS performance       |

## 6.2 Main Screen/Main Menu PSR SKY

Via the main menu, you can adjust PSR SKY to meet your requirements. You can find all important information during the operation of PSR SKY in the first line of the information field of the PSR mask (also see Chapter 4.2.2).

### 6.2.1 Main Screen PSR SKY

When PSR SKY operation mode is active, the information field of the PSR mask displays additional information on the status and setting of PSR SKY (see Fig. 112 – 1).

Switch between the pages using the “arrow button” at the right side of the information field (see Fig. 112 – 2).

When PSR SKY is used, the display of the current distance to the reference line simultaneously has the function of a button. By pressing the button, you can recalibrate the reference line (see Fig. 112 – 3).

Both function buttons “Distance” and “Response setting” have two functions each:

Briefly press the “Response setting” key (see Fig. 112 – 4) to change to the next multi-line in the multi-line mode.

By prolonged pressing of the “Response setting” key, you can set the response.

Briefly press the “Distance setting” key (see Fig. 112 – 5), to calibrate the reference line.

By prolonged pressing of the “Distance setting” key, you can set the distance.

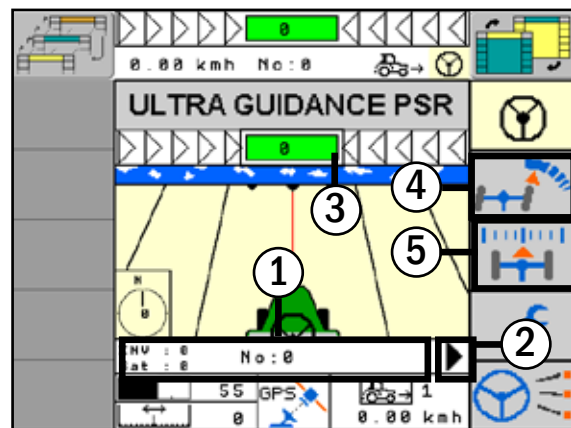


Fig. 112: Main screen

### GPS Status

Display of the quality of the GPS signal (see Fig. 113). The following table provides an overview of the available GPS signals and their quality.

Quality	Type of Signal
0	INV (no signal available)
1	GPS
2	DGPS
4	RTK fixed
5	RTKFloat
6	SAT



Fig. 113: GPS status

## Operation Mode

The first line shows the active mode and the second line displays the name of the selected job (see Fig. 114).

### NOTICE

In the PSR SKY operation mode multi-line, the name will be specified by the system.

If the current GPS quality is not displayed in the information field, it can be read from the main display field (see Fig. 114 – 2).

## Direction/Working Width

The first line of the information field shows the reference direction (“heading”) in which the system is working (see Fig. 115 – 1) and the second line the working width currently set in the system (see Fig. 115 – 2). The display depends on the selected operation mode.

## Signal Strength

The information field shows the GPS signal strength (see Fig. 116 – 1) in the first line and in the second line which base station receives the correction signal (see Fig. 116 – 2).

The following table gives an overview over the available signal strengths.

Reception	Description
99	No reception
0-10	Weak reception
32	Full reception

### NOTICE

You will only have GSM reception if you have an RTK-CLUE modem installed.

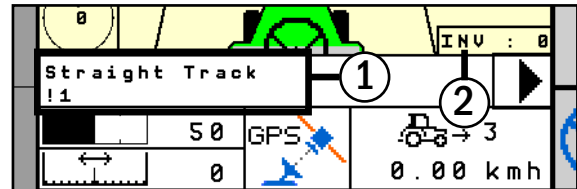


Fig. 114: GPS mode

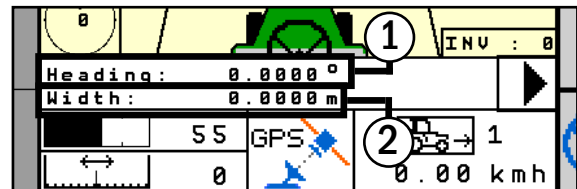


Fig. 115: Direction/working width

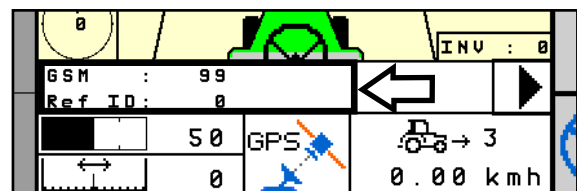


Fig. 116: Signal strength

### Working Data

In the upper information field (see Fig. 117 – 1), the deviation from the current leading line will be displayed in centimeters. The deviation is additionally depicted by arrows. The arrow direction corresponds to the required steering correction.

The track counter in the lower part of the information field (see Fig. 117 – 2) shows the current track number where the vehicle is located. Track number “0” is the logged reference line. The tracks on the right side are positive, the left tracks are negative.

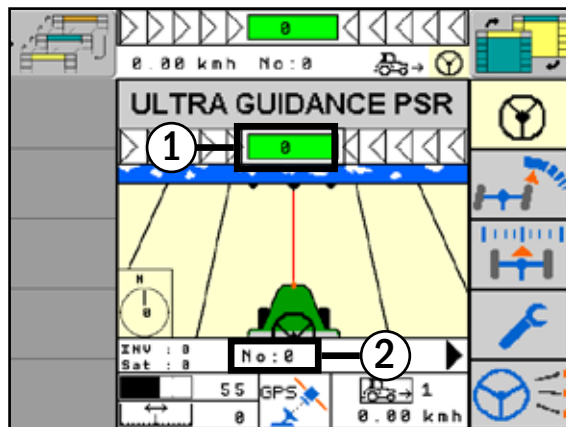


Fig. 117: Working data

### 6.2.2 Main Menu PSR SKY

With “GPS” operation mode selected, briefly press the “Menu” key (see Fig. 118) to get to the main menu of the PSR SKY operation mode.

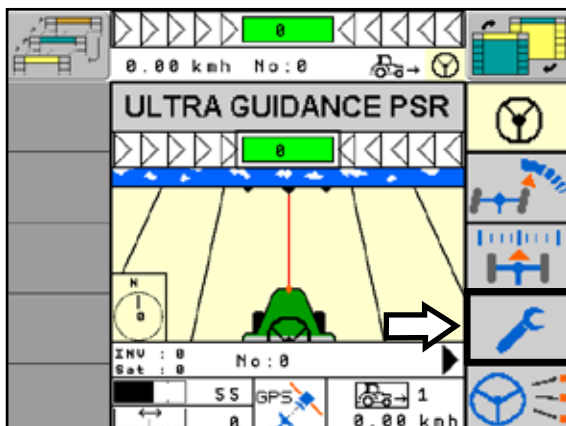


Fig. 118: Main menu

Navigate through the PSR SKY menu items using the “arrow keys right/left” (see Fig. 119).

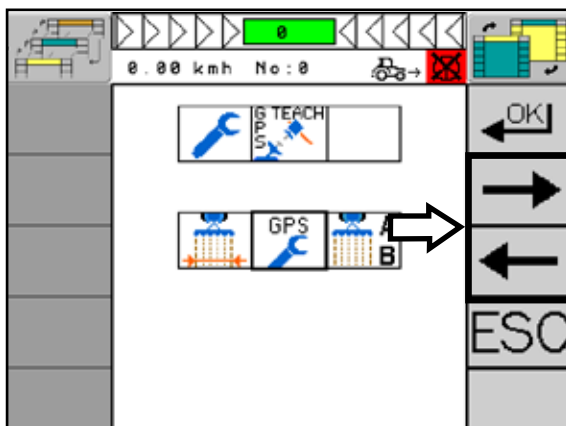


Fig. 119: Main menu navigation

## 6.3 Overview GPS Operation Mode

### NOTICE

When steering is active, not all functions are available.

### A-B Mode

In the A-B mode, the reference line will be determined by manually defining two points (see Fig. 120).

The steering will then be automatically guided in parallel with this reference line. The system stores up to 200 different reference lines.

### NOTICE

The system always calculates the shortest distance, even if you did not drive the shortest distance between the points when setting the line.

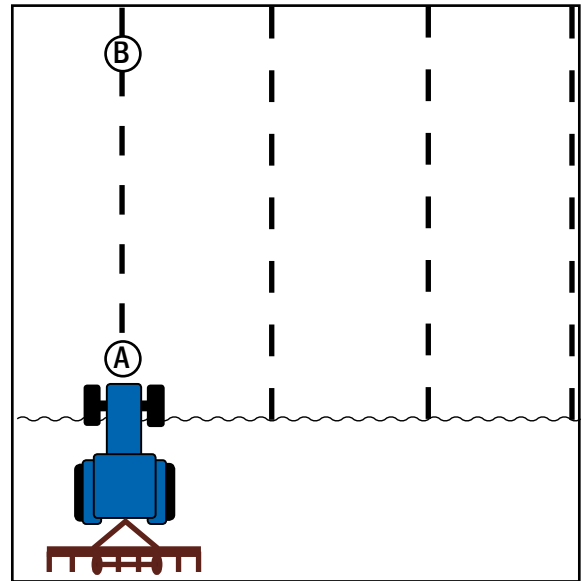


Fig. 120: A-B mode

### A+

In the A+ mode, the reference line will be determined by manually setting the starting point and the cardinal direction (see Fig. 121).

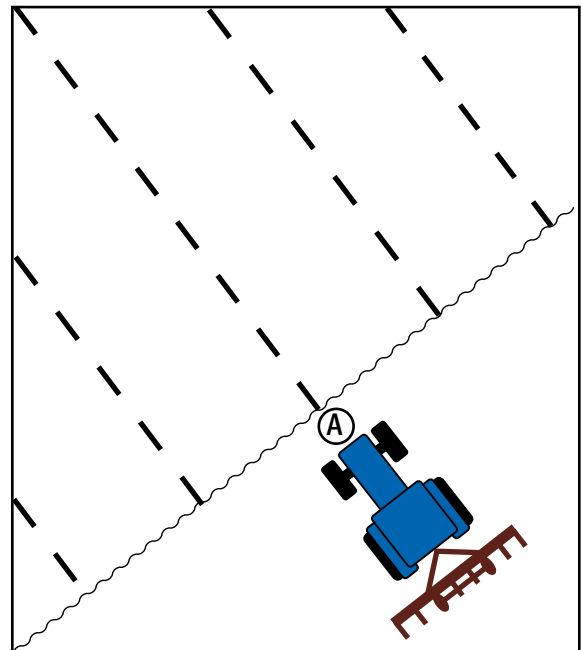


Fig. 121: A+

### Circle Mode

In the circle mode, a center point is defined. Around this center point, circles are driven at the distance of the working width (see Fig. 122). This GPS mode is suited for working fields when e.g. circles for irrigations must be driven.

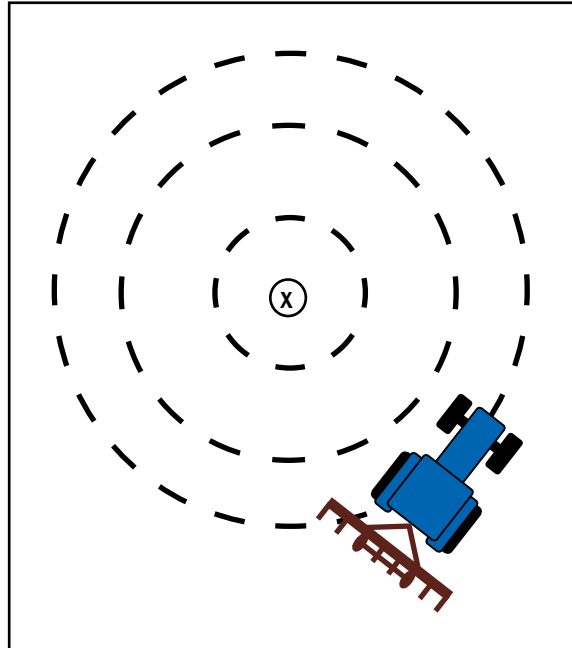


Fig. 122: Circle mode

### Multi-line Mode

The GPS mode multi-line links up to ten A-B lines in one job and is suited for working fields according to the scheme illustrated here (e.g. harvesting with a combine harvester) (see Fig. 123).

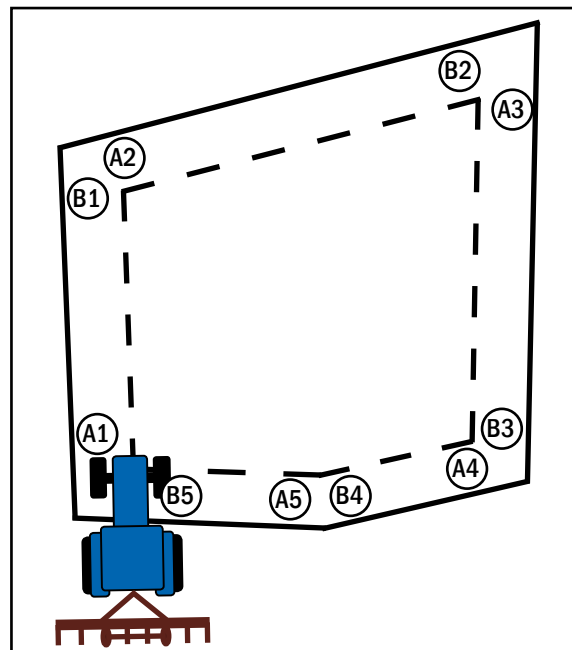


Fig. 123: Multi-line mode



### 6.3.1 A-B Mode

Select the menu item “A-B mode” in the PSR SKY main menu and confirm your selection with “OK” (see Fig. 124).

**NOTICE**

This function is only available with deactivated steering.

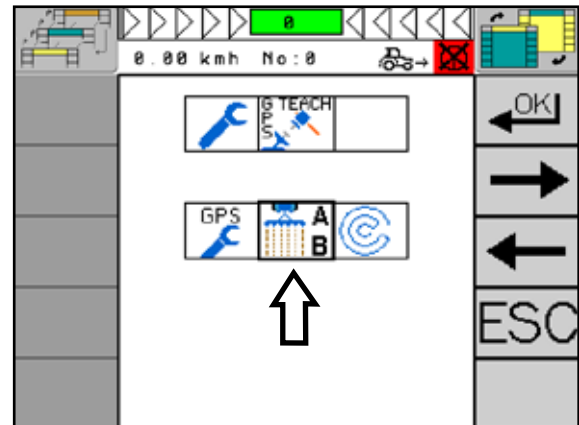


Fig. 124: Selecting A-B mode

#### 6.3.1.1 Straight Track

- ① Field With the “Field” button, you select a previously created and saved field (see Fig. 125 – 1).
- ② New With the “New” button, you create a new field (see Fig. 125 – 2 and Chapter 5.1.3).
- ③ Delete With the “Delete” button, the currently selected field is deleted (see Fig. 125 – 3).
- ④ Method With the “Method” button, you can determine how the A-B line is to be created (see Fig. 125 – 4). You have the following options:

- A + B
- A + Heading
- Lat/Lon
- Lat/Lon + Heading

These will be explained in detail in the following.

- ⑤ Width You can set the desired working width using the “Width” button (see Fig. 125 – 5).

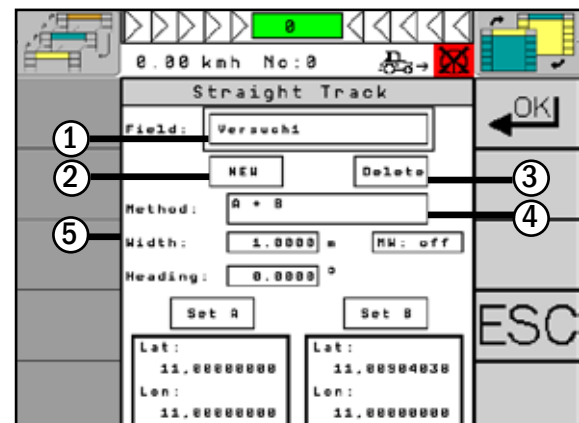


Fig. 125: Set straight track

**NOTICE**

When setting the working width of the implement, it is recommended to calculate an overlap, in order to avoid gaps.

This overlap depends on the quality of the GPS signal. It varies between 2-10cm/0.8"-3.94" (RTK signal) and 15-30cm/5.9"-11.8" (DGPS). The ideal overlap width shall be determined on site by conducting own trials.

**NOTICE**

If it becomes necessary due to a loss in GPS signal quality to redetermine the working width during work, all tracks will be shifted by the setting.

After changing the working width, it will be necessary to recalibrate the system to the reference line (also see Chapter 6.3.3).

### Method "A + B" = Defining Point A and B

Set point A of the A-B line using the "Set A" button (see Fig. 126 – 1) and point B using the "Set B" button (see Fig. 126 – 2).

**NOTICE**

Select two corners of the field for point A and B. The greater the distance between the points, the more exact is the logged reference line. A distance of less than 20m (7.9") is not permitted by the system.

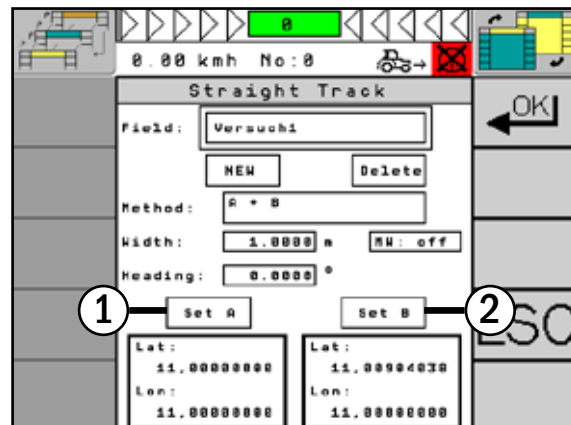


Fig. 126: Defining point A and B

### Method "A + Heading" = Defining Point A and Entering the Cardinal Direction

Select the exact cardinal direction using the "Heading" button (see Fig. 127 – 1) that you want to head for. Alternatively, you can determine the cardinal direction by targeting a point and driving towards it. As soon as the direction is correct, confirm the selection.

Now set Point A using the "Set A" button (see Fig. 127 – 2).

**NOTICE**

Use "A + heading" only if you know the exact cardinal direction.

The cardinal direction of the reference line will also be stored for each job in the system.

Stop the vehicle if you wish readjust the driving direction.

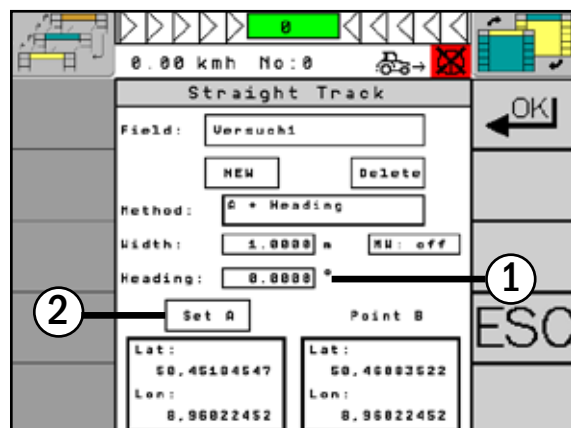


Fig. 127: Defining point A and entry of the heading

### Method “Lat/Lon” = Entering the Coordinates of Point A and B

Select the “Lat” / “Lon” buttons for point A and point B in order to enter the desired coordinates (see Fig. 128).

**NOTICE**

Setting of the “Width” function is only possible when “MW” (multi width) is deactivated.



Fig. 128: Entering the coordinates of point A and B

### Method “Lat/Lon + Heading” = Entering the Coordinates of Point A and Entering the Cardinal Direction

Select the exact cardinal direction using the “Heading” button (see Fig. 129 – 1) that you want to head for. Alternatively, you can determine the cardinal direction by targeting a point and driving towards it. As soon as the direction is correct, confirm the selection.

Select the “Lat” / “Lon” buttons of point A in order to enter the desired coordinates (see Fig. 129 – 2).

**NOTICE**

Use “Lat/Lon + Heading” only if you know the exact cardinal direction.

The cardinal direction of the reference line will also be stored for each job in the system.

Stop the vehicle if you wish readjust the driving direction.



Fig. 129: Entering the coordinates of point A and entering the heading

### 6.3.1.2 Multi Width

For different working widths, you have the possibility to drive the field along the pattern of the entered track, e.g.:

- 10 tracks for onions with a working width of 9m
- 1 care track for irrigation with a working width of 4m

ULTRA GUIDANCE PSR ISO in the PSR SKY operation mode designates this as “multi width”.

Select “MW” in the “Straight Track” mask and activate it (see Fig. 130).

The setting mask for multi width will be opened. You have the following options:

#### Seed Rows (see Fig. 131 – 1)

- Width = working width of the bed track
- Number of rows = number of rows between the care tracks

#### Tram Path (see Fig. 131 – 2)

- Width = working width of the care track
- Number of rows = number of rows between the bed rows

#### Type of AB Line “0” (see Fig. 131 – 3)

- Type of line = defines which type (seed row or tram path) the asynchronous tracks begin with.  
Use the seed rows if you e.g. want to harvest a row with seeds.  
Use the tram path if you want to use a row as tramline.
- Line no. = defines which number the selected seed row/tram path begins with.
- Active = switch function on and off

Confirm your entry with “OK”.

#### NOTICE

In the “Type of AB line”, the current coordinates (Set A/Set B) are adopted with reference to the current A-B line.

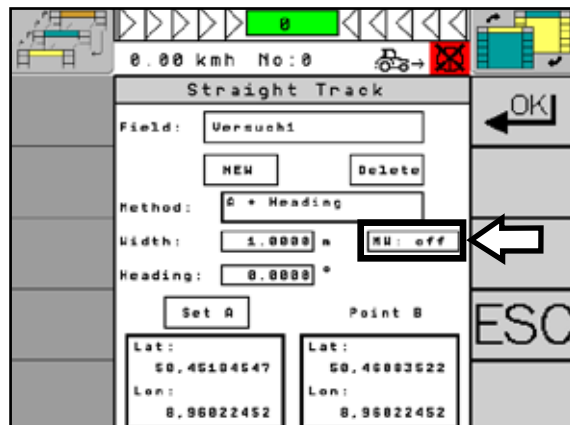


Fig. 130: Open multi width



Fig. 131: Multi width settings

### Example 1 for Multi Width

If you have laid out two seed rows (S1-S2) with a working width of 3m and four tram paths (T1-T4) with a working width of 6m and you want to begin with line T2 (see Fig. 132), you make the following settings (see Fig. 133):

Seed rows:

- Width: 3.0000 m
- Number of rows: 2

Tram path:

- Width: 6.0000 m
- Number of rows: 4

Type of AB line 0:

- Type of line: Tram path
- Line no.: 2
- Active: MW on

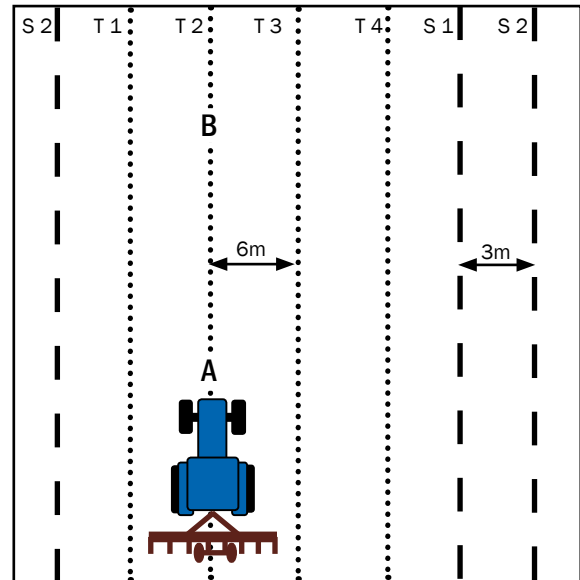


Fig. 132: Example 1 multi width



Fig. 133: Example 1 settings

### Example 2 for Multi Width

If you have created five seed rows (S1-S5) with a working width of 2m and two tram pathes (T1-T2) with a working width of 0.5m and you want to begin with track S2 (see Fig. 134), you make the following settings (see Fig. 135):

Seed rows:

- Width: 2.0000 m
- Number of rows: 5

Tram path:

- Width: 0.5000 m
- Number of rows: 2

Type of AB line 0:

- Type of line: Seed rows
- Line no.: 2
- Active: MW on

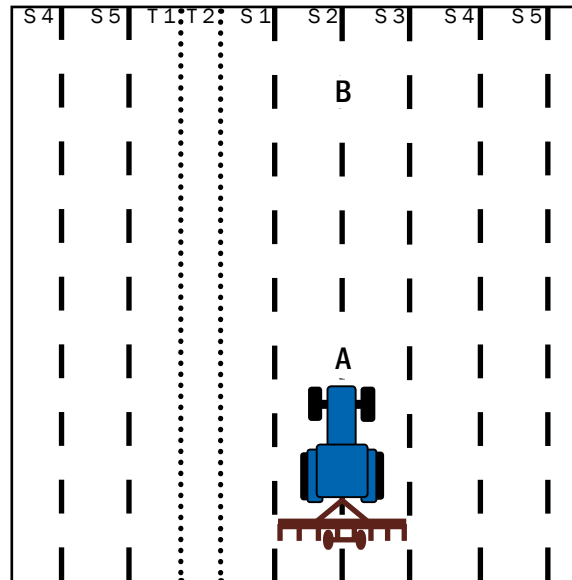


Fig. 134: Example 2 multi width

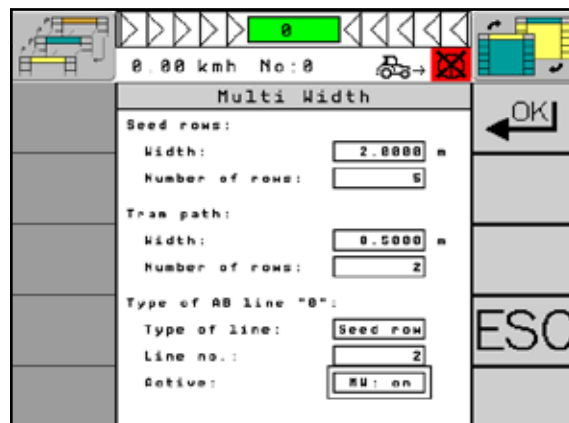


Fig. 135: Settings for example 2

### 6.3.2 Circle Track Mode

Select the menu item “Circle Track” in the PSR SKY main menu and confirm your selection with “OK” (see Fig. 136).

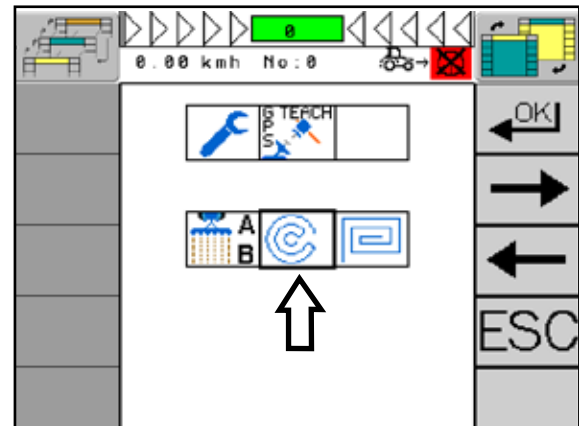


Fig. 136: Circle mode

The setting mask for the circle track mode will be opened.

The settings under item 1 (see Fig. 137 – 1) can be found in Chapter 6.3.1.1.

Select the “Method” button (see Fig. 137 – 2) and define how the circles shall be laid out. You have the following options:

- Drive Circle
- Lat/Lon
- Set Center

(These options will be explained in the following.)

In addition, you must set the working width (see Fig. 137 – 3).

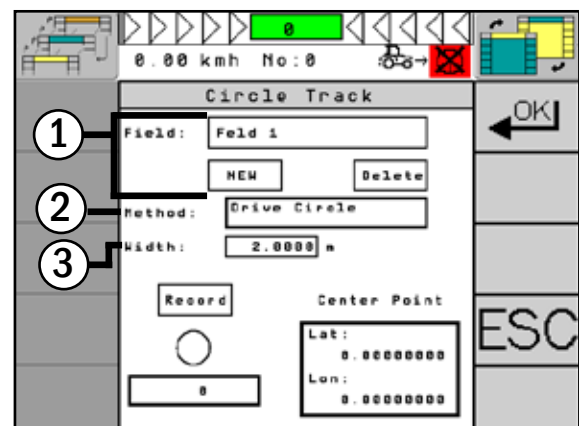


Fig. 137: Circle track mode setting

**NOTICE**

When setting the working width of the implement, it is recommended to calculate an overlap, in order to avoid gaps.

This overlap depends on the quality of the GPS signal. It varies between 2-10cm/0.8"-3.94" (RTK signal) and 15-30cm/5.9"-11.8" (DGPS). The ideal overlap width shall be determined on site by conducting own trials.

**NOTICE**

If it becomes necessary due to a loss in GPS signal quality to redetermine the working width during work, all tracks will be shifted by the setting.

After changing the working width, it will be necessary to recalibrate the system to the reference line (also see Chapter 6.3.3).

### Method Drive Circle

Drive circle defines the center point for all following tracks. ULTRA GUIDANCE PSR ISO calculates the circle center automatically after a three-quarter circle.

You can start and stop the recording with the “Record” button (see Fig. 138 – 1). Now drive a three-quarter circle. The status bar indicates the progress (see Fig. 138 – 2).

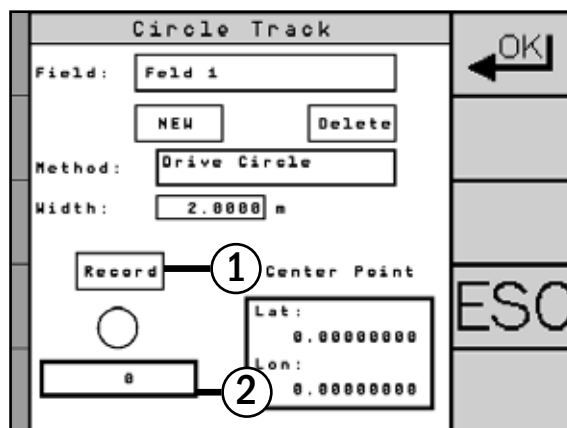


Fig. 138: Define center by driving circles

### Lat/Lon Method

Enter the exact coordinates of the circle center.

Now select the “Lat/Lon” button and enter the current coordinates of the circle center (see Fig. 139).

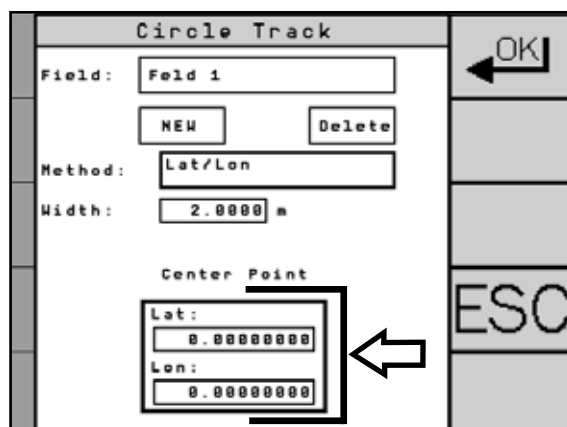


Fig. 139: Enter coordinates of the circle center

### Set Center Method

Adoption of the current coordinates as circle center.

Select the “Set Center” button to save the current coordinates as circle center (see Fig. 140). The current coordinates used as circle center are displayed with “Lat” and “Lon” in the field at the bottom.

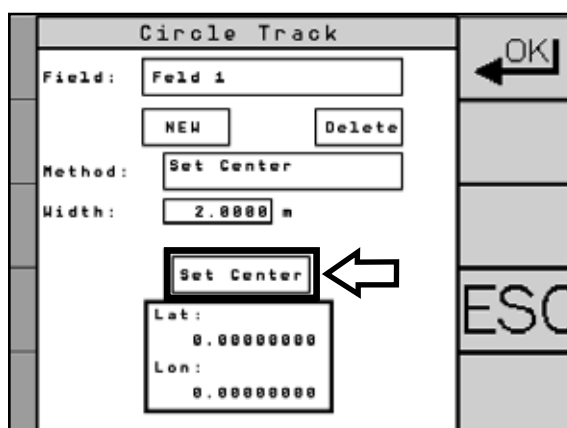


Fig. 140: Adoption of the current coordinates as circle center



### 6.3.3 Multi-line Mode

Link several A-B lines in one job.

Draw the individual lines in the exact order you wish to drive them later. Subsequently changing the lines in the system is not possible.

Select the menu item “Multi-line” in the PSR SKY main menu and confirm your selection with “OK” (see Fig. 141).

**NOTICE**

This function is only available with deactivated steering.

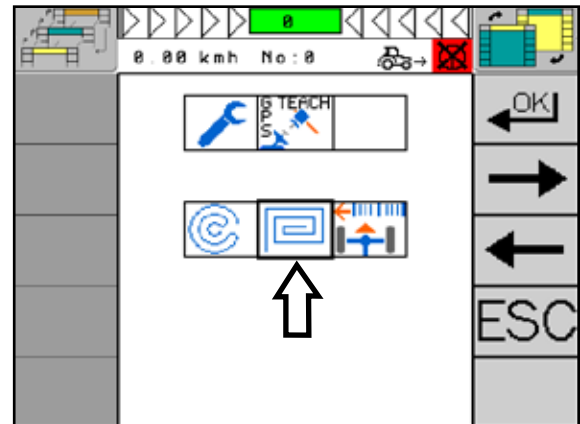


Fig. 141: Multi-line mode

#### Record Multi-line in the A-B Mode

Select “New Job” and confirm your selection with “OK” (see Fig. 142).

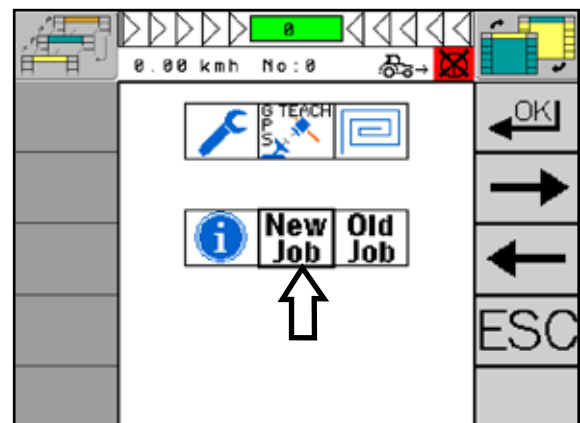


Fig. 142: Record multi-line

Select “A→B” and confirm your selection with “OK” (see Fig. 143).

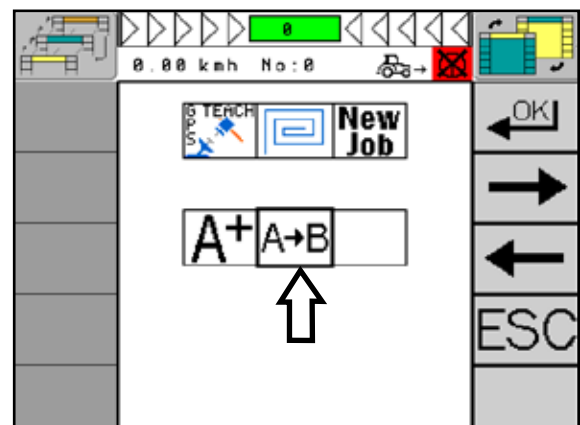


Fig. 143: Record in the A-B mode

The display shows an “A” in a flashing frame. In the field on the left, the number of the current A-B line will be displayed (here “1”). Drive to the desired point A of your current A-B line and confirm this point with “OK” (see Fig. 144).

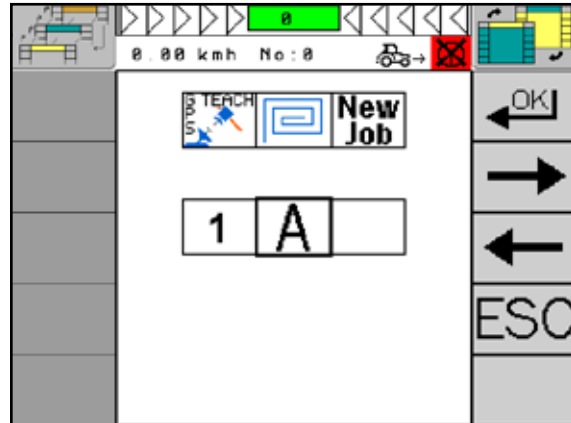


Fig. 144: Head for and confirm point A

The display shows an “B” in a flashing frame. Drive to the desired point B and confirm this position with “OK” as well (see Fig. 145).

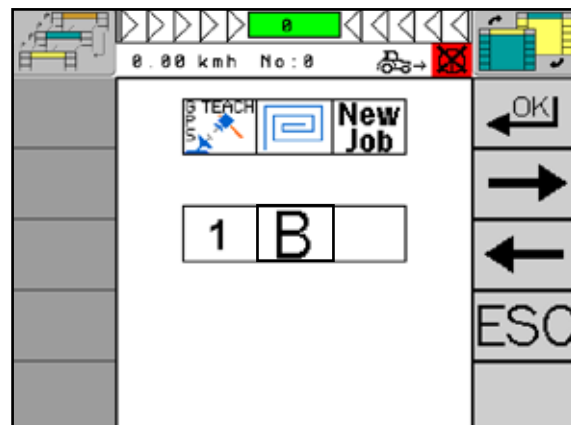


Fig. 145: Head for and confirm point B

After confirming point B, the recording of the current A-B line is complete. The display will show the next subitem (see Fig. 146).

Select “Start” if you want to record a further line.

Select “Stop” if you want to complete the multi-line.

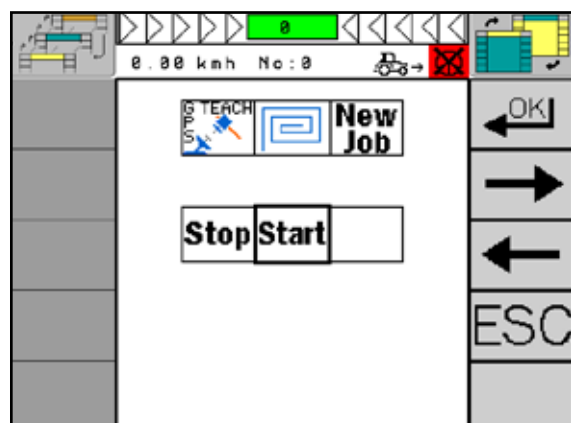


Fig. 146: Complete recording or record line

If you have selected “Start”, the next A-B line will be displayed with an “A” and a flashing frame. The field on the left shows the consecutive number (here "2") (see Fig. 147). You can now record a further line. Proceed as described in the previous step.

Up to ten A-B lines can be saved in one multi-line.

After completion of the tenth A-B line, the multi-line will be saved automatically.

If you have selected “Stop”, the main screen will be displayed.

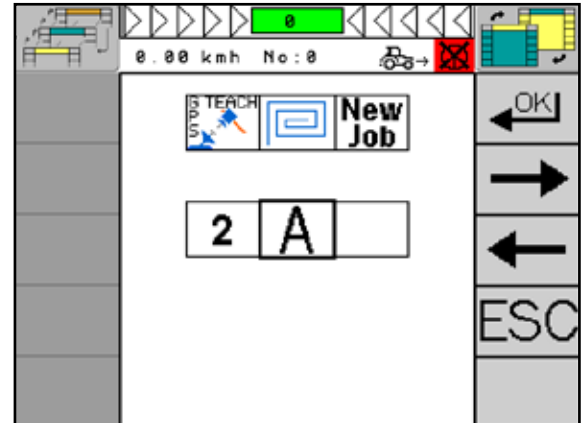


Fig. 147: Record further line

#### Record Multi-line in the A+ Mode

Select “New Job” in the multi-line GPS mode and confirm your selection with “OK” (see Fig. 148).

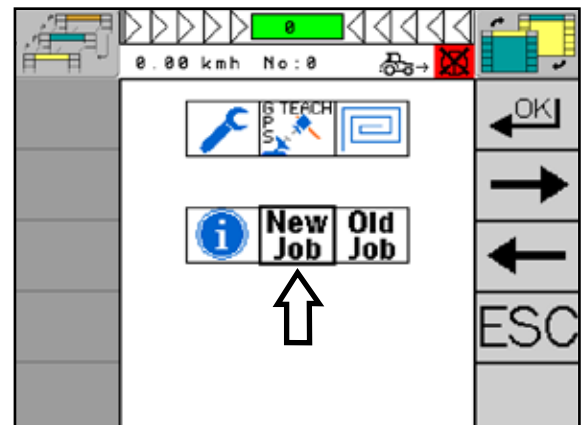


Fig. 148: Record line in the A+ mode

Select the “A+” button and confirm your selection with “OK” (see Fig. 149).

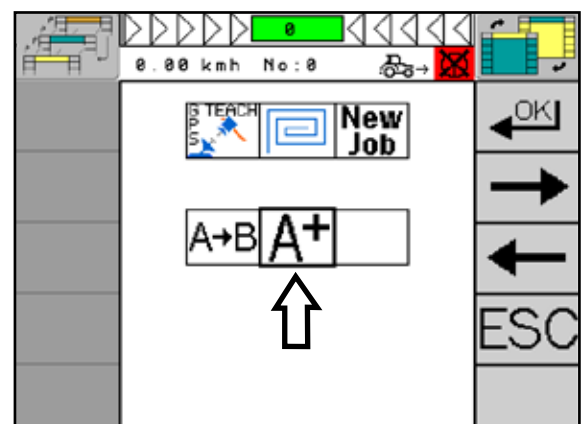


Fig. 149: Select A+ mode

The display shows an “A” in a flashing frame. In the field on the left, the number of the current A-B line is displayed (here “1”). Drive to the desired point A of your current A-B line and confirm this point with “OK” as well (see Fig. 150).

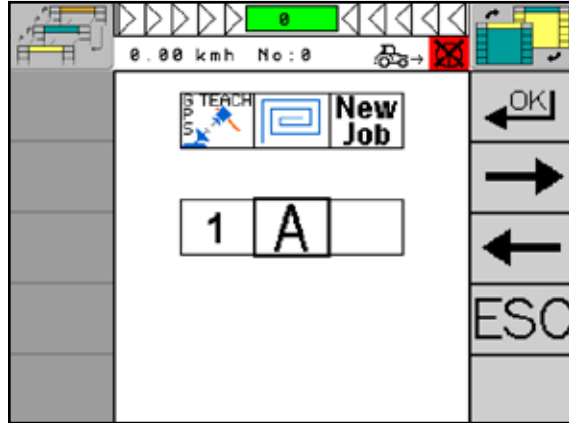


Fig. 150: Head for and confirm point A

The current driving direction will be displayed in the information field. Stop the vehicle to manually set the cardinal direction.

Select the decimal place you want to enter by pressing the “arrow keys right/left” (see Fig. 151).



Fig. 151: Set cardinal direction - select decimal place

Press the “plus and minus key” to enter the exact cardinal direction. Afterwards, press “OK” for at least 2 seconds to save your entry (see Fig. 152).

Alternatively, you can determine the driving direction by targeting a point and driving towards it.

**NOTICE**

Stop the vehicle if you wish readjust the driving direction.



Fig. 152: Set cardinal direction

Select “Start” if you want to record a further line.

Select “Stop” if you want to complete the multi-line (see Fig. 153).

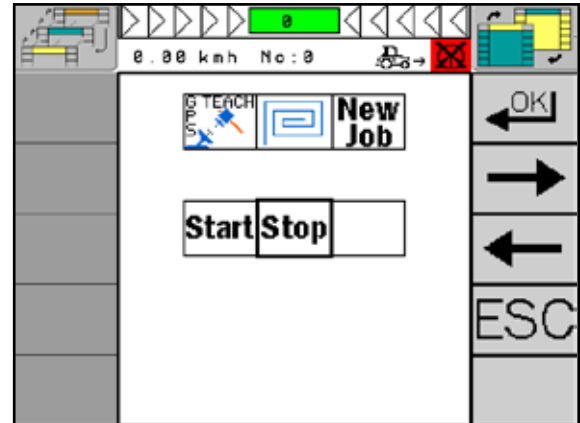


Fig. 153: Complete recording or record line

If you have selected “Start”, the next A-B line will be displayed with an “A” and a flashing frame. The field on the left shows the consecutive number (here "2") (see Fig. 154).

Up to ten A-B lines can be saved in one multi-line.

After completion of the tenth A-B line, the multi-line will be saved automatically.

After saving the multi-line, the main screen will be displayed.

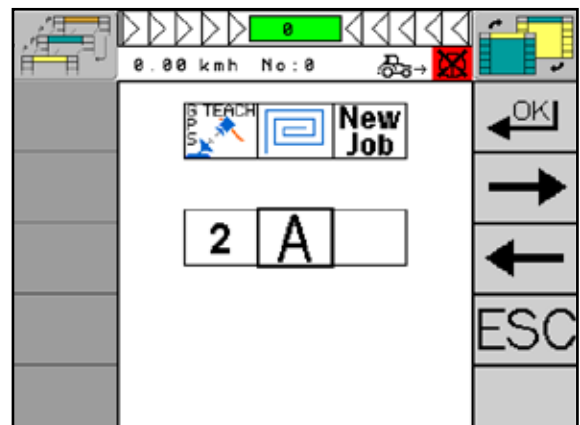


Fig. 154: Record further line

### Multi-line Information

Select "Information" and confirm your selection with "OK" (see Fig. 155).

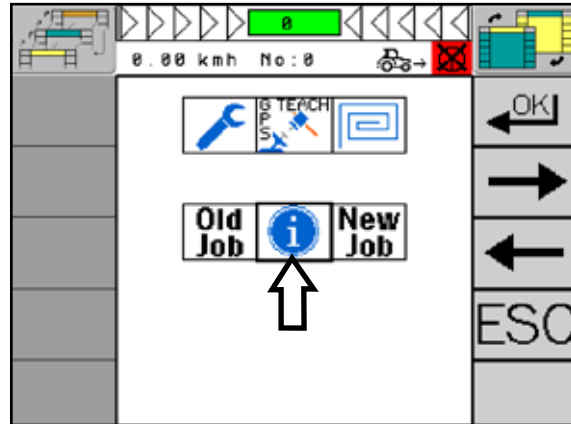


Fig. 155: Multi-line information

The first large digit (see Fig. 156 – 1) shows the number of the A-B line and the respective cardinal direction on the right side (see Fig. 156 – 2).

**NOTICE**

The system always displays all A-B lines recorded for the multi-line.

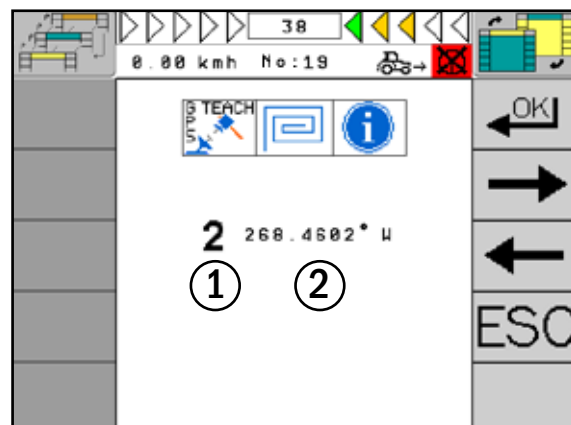


Fig. 156: Information display

## 6.4 Set Working Width

The working width is required to steer the vehicle at the correct distance in parallel with a reference line.

Select the menu item “Working width” in the PSR SKY main menu and confirm your selection with “OK” (see Fig. 157).

For the A-B line and Circles GPS modes, you proceed as described in the relevant chapters (see Chapter 6.3.1 and Chapter 6.3.2).

**NOTICE**

This function is only available with deactivated steering.

**NOTICE**

When setting the working width of an implement, it is recommended to calculate an overlap, in order to avoid gaps.

This overlap depends on the quality of the GPS signal. It varies between 2-10cm/0.8"-3.94" (RTK signal) and 15-30cm/5.9"-11.8" (DGPS). The ideal overlap width shall be determined on site by conducting own trials.

Press the selection button on the terminal to call up the entry field of the desired working width (see Fig. 158).

Enter the desired working width. Proceed as described in Chapter 5.1.2.

**NOTICE**

If it becomes necessary due to a loss in GPS signal quality to re-determine the working width during work, all tracks will be shifted by the setting.

After changing the working width, it will be necessary to recalibrate the system to the reference line (also see Chapter 6.3.3).

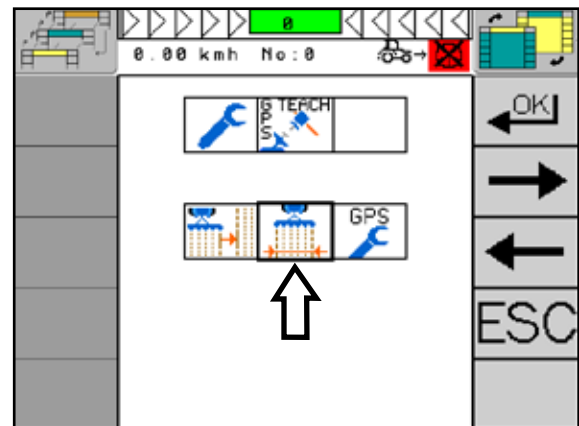


Fig. 157: Set working width

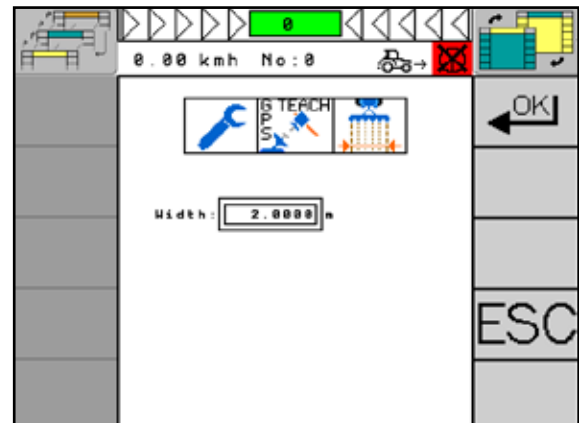


Fig. 158: Enter desired working width

## 6.5 Set the Implement Offset

It is necessary to adjust the implement if it is not exactly following the track of the towing vehicle, but steering to one side.

You can recognize this behavior from the fact that, after driving three tracks, one partial surface has been worked twice (see Fig. 159 – 1) and another part remains unworked (see Fig. 159 – 2).

To adjust the implement, you need to measure the distance of the unworked surface after the third track using the folding meter.

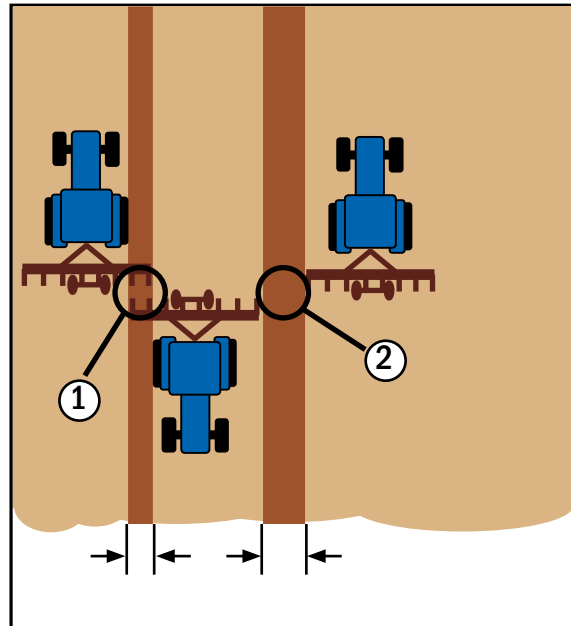


Fig. 159: Device offset

Select the menu item “Adjust implement” in the PSR SKY main menu and confirm your selection with “OK” (see Fig. 160).

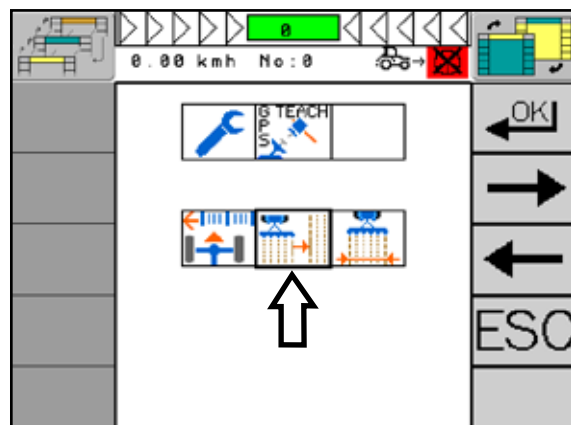


Fig. 160: Set the device offset



Press the “plus and minus key” and enter the previously measured value (see Fig. 161).

Alternatively, you can enter the value manually. Proceed as described in Chapter 5.1.2.

Please also consider the following:

- If the implement has an offset to the right, i.e. the unworked surface is on the left (in driving direction), the measured distance must be entered with a prefixed “minus character”.
- If the implement has an offset to the left, i.e. the unworked surface is on the right (in driving direction), the measured distance must be entered with a prefixed “plus character”.

Confirm and save the entry. Proceed as described in Chapter 5.1.4.

**NOTICE**

After making any changes, you need to drive three tracks first and then check the settings again.

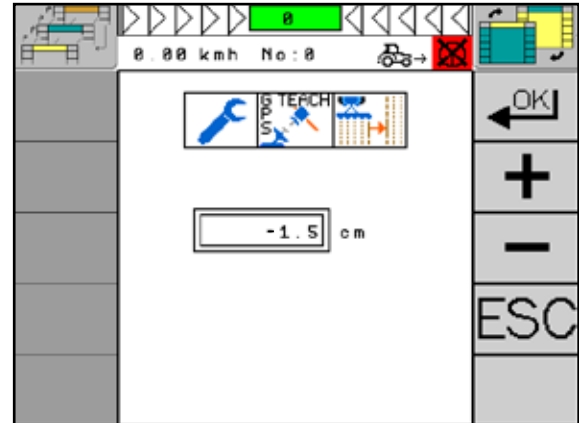


Fig. 161: Enter value for device offset

## 6.6 Set Nudging

In the “Set nudging” menu item, you determine the amount of centimeters the distance is shifted by per key-stroke on the “Distance setting” function key in the PSR main screen.

**NOTICE**

This setting shall only influence the PSR SKY operation mode.

Select the menu item “Set nudging” in the PSR SKY main menu and confirm your selection with “OK” (see Fig. 162).

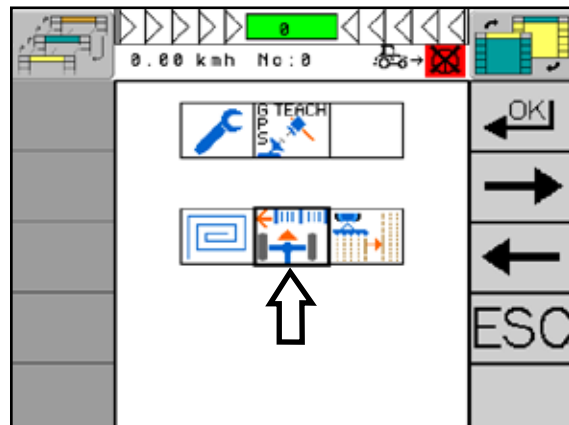


Fig. 162: Nudging setting

Press the “plus and minus key” to set the desired nudging value (see Fig. 163). Alternatively, you can enter the value manually. Proceed as described in Chapter 5.1.2. Confirm and save the entry. Proceed as described in Chapter 5.1.4.

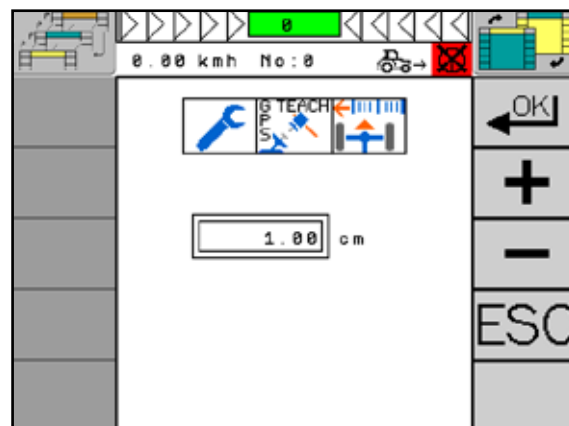


Fig. 163: Set nudging value

### 6.6.1 GPS Performance

In the “GPS Performance” menu item, you can make the setting for entering the track.

Select the menu item “GPS Performance” in the PSR main menu and confirm your selection with “OK” (see Fig. 164).

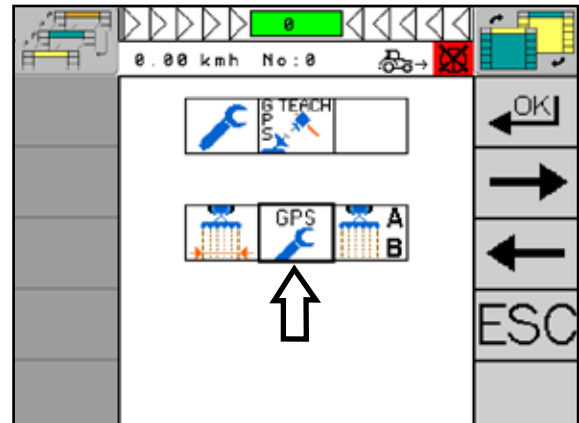


Fig. 164: GPS performance

Firstly, set the driving direction of your vehicle. This can be entered via the button (see Fig. 165 – 1).

Now make via the plus/minus keys (see Fig. 165 – 2 and 3) the settings for:

- the line acquire angle
- undershoot/overshoot

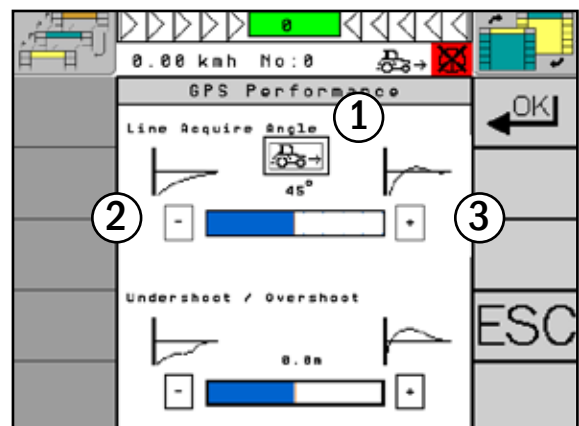


Fig. 165: Make GPS performance settings

Select a flat swivel angle for a flat and prolonged entering into the track (see Fig. 166 – 1).

Select a steep swivel angle for a steep and shortened entering into the track (see Fig. 166 – 2).

The angles range from 10° to 80°.

**NOTICE**

If the vehicle moves strongly when entering the track, the swivel angle is too large.

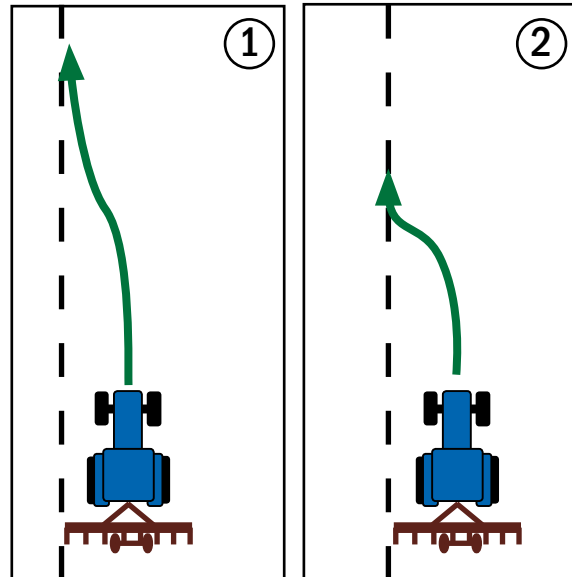


Fig. 166: Example swivel angle

Select “Undershoot” (value range from -3.00m to 0m) for implements with large booms (e.g. spraying device) (see Fig. 167 – 1).

Select “Overshoot” (value range from 0m to 3.00m) for long implements (see Fig. 167 – 2).

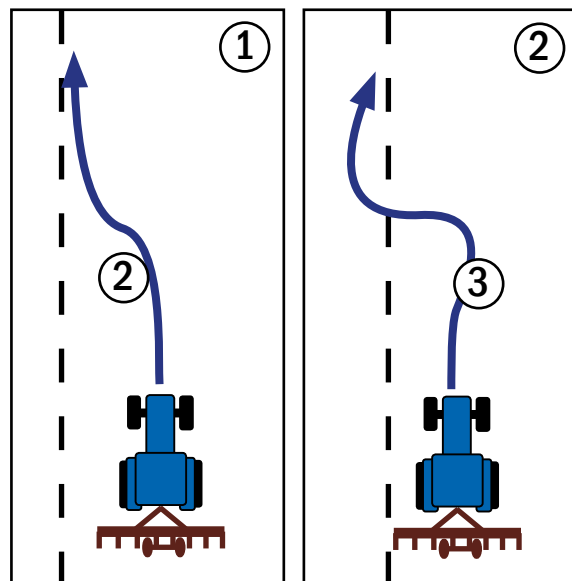


Fig. 167: Example undershoot/overshoot

## 6.7 Working with PSR SKY

### 6.7.1 Calibrate Reference Lines

During work, after an interruption of work or after changing the work place, the reference line may be shifted due to a satellite drift. If the deviation is too large, the reference line must be reset.

Drive back to a known position and reset the reference line.

Press the function key (see Fig. 168 – 1) to calibrate the reference line.

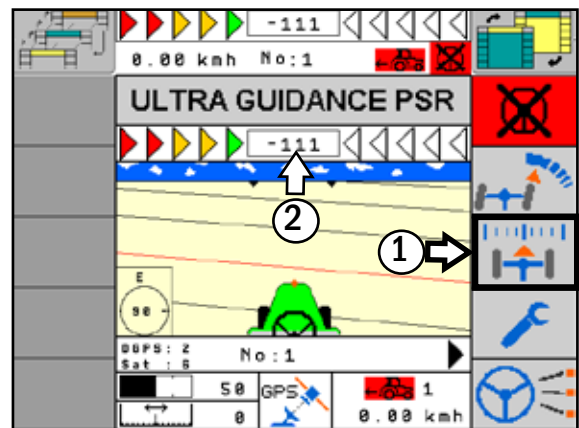


Fig. 168: Calibrate reference line

Press “OK” to reset the reference line to Zero (see Fig. 169).

Alternatively, you can also calibrate the reference line directly via the button in the PSR mask (see Fig. 168-2).

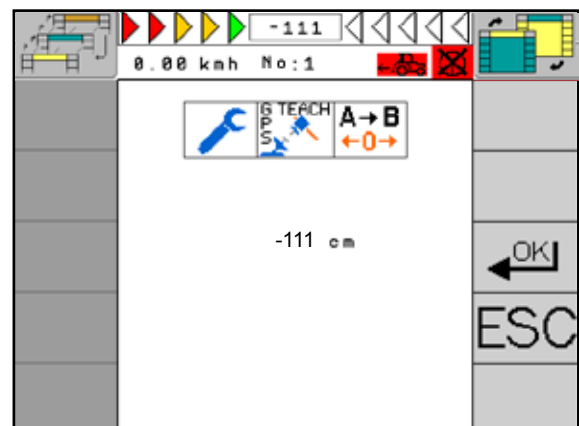


Fig. 169: Set reference line to zero

## 6.7.2 Working with the Multi-line

When the multi-line GPS mode is active, there are further functions available in the PSR SKY main screen.

Press the “Response” function key (see Fig. 170) to change to the next multi-line.

**NOTICE**

If ULTRA GUIDANCE PSR ISO is active, the next multi-line is only pre-selected by the described function button.

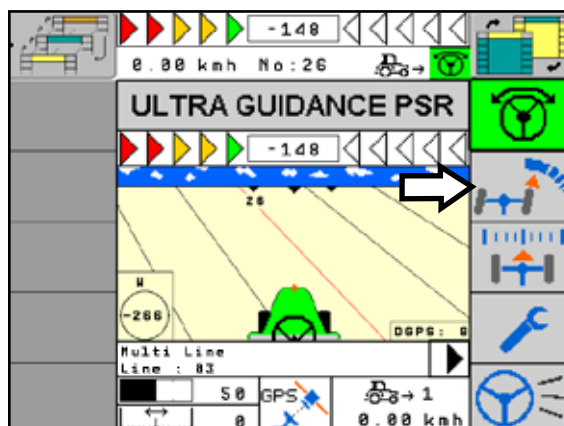


Fig. 170: Change to the next multi-line

The number on the right side in the information field represents the preselected multi-line (see Fig. 171). As soon as ULTRA GUIDANCE PSR ISO is deactivated or the “Steering by wire” operation mode is selected, the system will adopt the preselected multi-line (see Fig. 172).

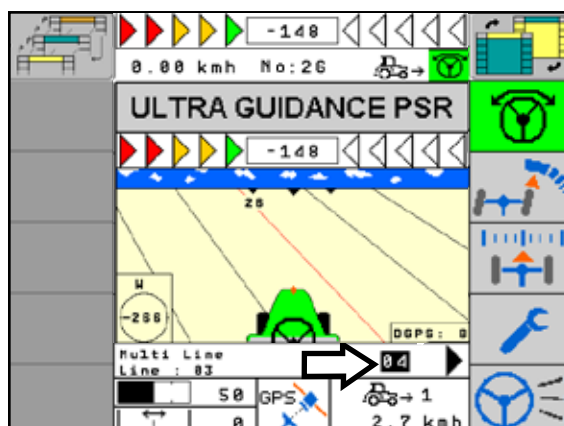


Fig. 171: Preselected multi-line



Fig. 172: Multi-line adopted

## 7 PSR SONIC

PSR SONIC is steering with ultrasound by scanning of existing leading lines.

### 7.1 PSR SONIC – Application-specific Changes/Vehicle Changes: Mount and Set Sensors

It may become necessary to dismount the components of PSR SONIC and remount them on e.g. another vehicle or to make application-specific changes of the settings. This will also require recalibration of the sensors.

#### 7.1.1 Mount PSR SONIC Sensor

The sensors are mounted ready for operation upon commissioning (see Fig. 173).

After changing the vehicle, you shall proceed as during the initial mounting. The initial mounting is described in the vehicle-specific installation description. Dismounting of the components shall be carried out in reverse order.

Mount the sensor carrier on the vehicle using the bracket.

#### NOTICE

The design of the sensor carrier and its fixture is individual for each vehicle. If you have any questions concerning the mounting of the carrier, please refer to your retailer or Reichhardt.

Connect the sensors with the front socket of the vehicle using the connection cable.

#### NOTICE

During the installation of the sensor, please note that sensor no. 1 (S1) is always positioned on the left side in driving direction.

During mounting to another vehicle, please consider that the symmetry of the sensors must be accurate. Define a center point and check that the distances  $a_1$  and  $a_2$  as well as  $b_1$  and  $b_2$  are each identical (see Fig. 174). Please also check the setting of the height.



Fig. 173: SONIC sensors ready for operation

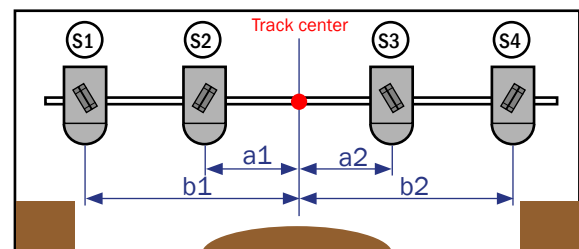


Fig. 174: Example for setting of the sensors (in driving direction)

### 7.1.2 Set PSR SONIC Sensors

The ultrasound sensors are mounted on the sensor plate, swiveling and latching. They are manually adjustable by  $\pm 90^\circ$  from the vertical in every direction (see Fig. 175).

The sensor plates are enclosed by a housing and mounted on the sensor carrier. This way, they can be adjusted to the track width of the respective vehicle.

You need to adjust the sensor for the specific purposes. First, you need to loosen the knob screw on the back of the sensor plate (see Fig. 176). Grasp under the housing cover and move the sensor into the desired position (also see Fig. 175).

**NOTICE**

Please observe that the sensor locks into place in one of the specified positions. Otherwise, the sensor can be unintentionally adjusted during operation.

**NOTICE**

It is recommended to always adjust the sensors to an angle of  $45^\circ$  and induce necessary setting changes by e.g. changing the height.

All sensors must be locked in the same hole (mirrored) on the sensor plate. The only exception is the “Crop edge right/left with correction” operation mode. Sensors 2 and 3 must be aligned in such a way that the measuring beam points down vertically (further information on the PSR SONIC operation modes can be found in Chapter 7.3).

**NOTICE**

Adjust the sensors in such a way that the distance to the measuring object (edge, track) is between 40 and 80 cm (16-31 inch) (see Fig. 177).

In order to obtain this measure, you must either adjust the height of the sensor carrier or slide the sensors laterally.

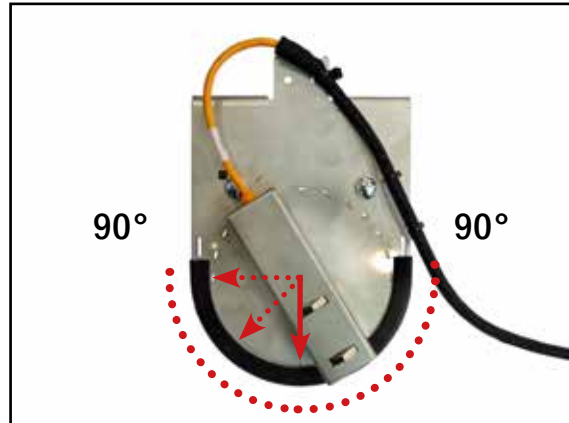


Fig. 175: Adjust sensor angle

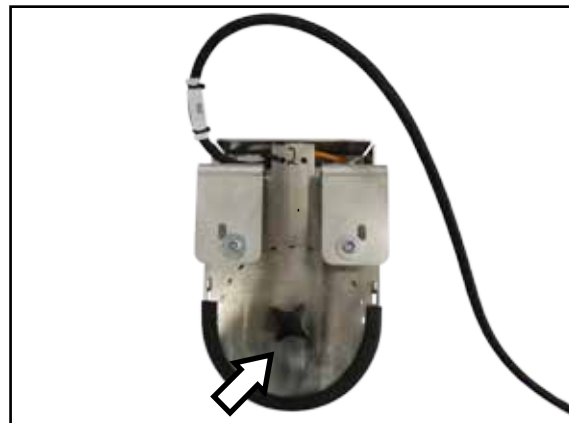


Fig. 176: Knob screw of the sensors

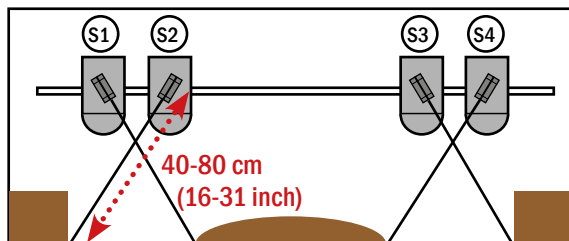


Fig. 177: Setting of the sensors



The sensors of PSR SONIC can reliably detect plants from a plant height of 10cm (4").

When scanning a track with marker, make sure that the track is similar to the one shown in Fig. 178.

**NOTICE**

When setting the sensors in the working areas, please ensure that the sensors are directly pointing to the measuring object.

Use e.g. a folder meter to determine and extend the beam direction (see Fig. 179).

**NOTICE**

If you have problems with the settings, please contact your retailer or Reichhardt.

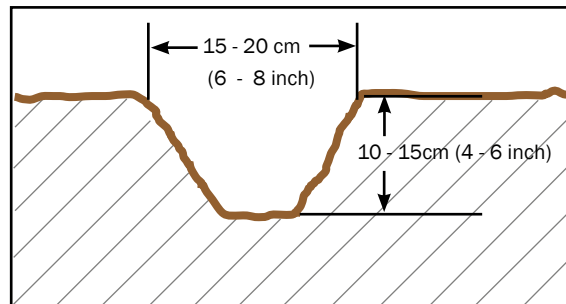


Fig. 178: Track marker specifications



Fig. 179: Adjust sensors

## 7.2 Main Screen/SONIC Configuration

Via the operation mode main menu, you can adjust PSR SONIC to meet your requirements. The menu is clearly summarized on one page.

### 7.2.1 PSR SONIC Main Screen

When the PSR SONIC operation mode is activated, you can obtain information on the current SONIC operation and the current track from the second line of the information field of the PSR mask (see Fig. 180).

The area on the right side of the information field (driving direction and speed) is only active in the combi mode and in the Sensor+ mode. The mode is described in Chapter 7.4.4.

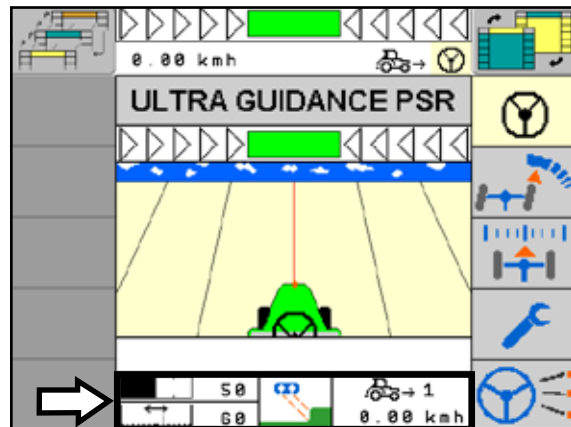


Fig. 180: Main screen with information field in the Sensor+ mode

### 7.2.2 SONIC Configuration

With "PSR SONIC" operation mode selected, briefly press the "Main menu" key (see Fig. 181) to get to the main menu of the "SONIC configuration" mode.

On the menu side of the SONIC configuration, you can make different device settings (see Fig. 182).

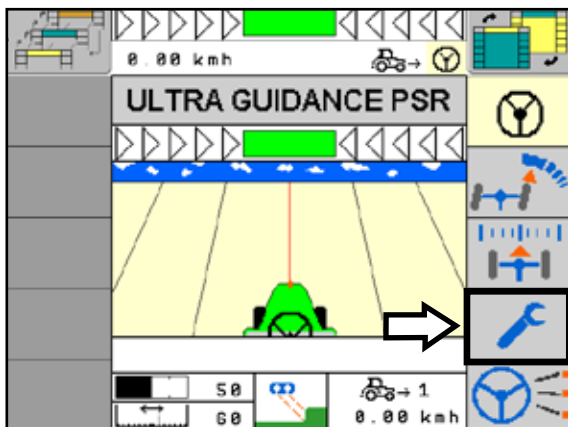


Fig. 181: Main menu

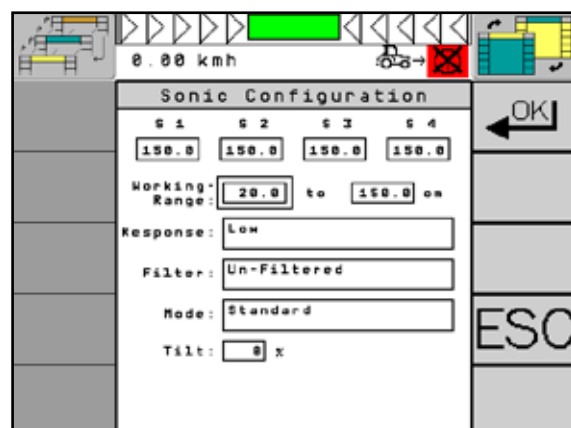


Fig. 182: Overview menu page

### 7.3 PSR SONIC Operation Mode

Select the required operation mode of PSR SONIC and then carry out the settings via the “SONIC configuration”.

The PSR SONIC operation mode of ULTRA GUIDANCE PSR ISO offers the following modes:

#### Operation Modes with two Sensor Pairs



##### Swath Center

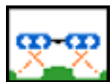
Uses a swath (harvested material, straw, hay, etc.) as leading line.



##### Swath with Alternation

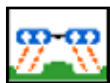
Uses a swath (harvested material, straw, hay, etc.) as leading line.

If the swath is small, a load in a baler for example can become one-sided when guided over the swath along a straight line. In order to prevent this, the vehicle can be guided over the swath alternately from left to right.



##### Tramline Intersection

Steering control along a tramline. This is the ideal operation mode for subsequent field processing, e.g. fertilizing, spraying.



##### Tramline outside

Steering control along significantly better outer edges of a tramline.

#### Operation Modes with one Sensor Pair



##### Crop Edge

Uses a crop edge as leading line. You can change between right and left crop edge.



##### Crop Edge Crosswise

You can select this operation mode if the reference edge used as leading line is only on one side (e.g. potato or asparagus ridges).



##### Crop Edges with Height Correction

Crop edge guidance with height correction You can use this operation mode on hilly terrain to compensate for differences in height.

The following subchapters describe the different operation modes of *PSR SONIC* in detail.

### 7.3.1 Tramline Intersection

Select the “Tramline intersection” operation mode as described in Chapter 4.4 (see Fig. 183 – 1).

In the “Tramline intersection” operation mode, distance (see Fig. 183 – 2) describes a lateral displacement of the vehicle from the leading line to the left or to the right.

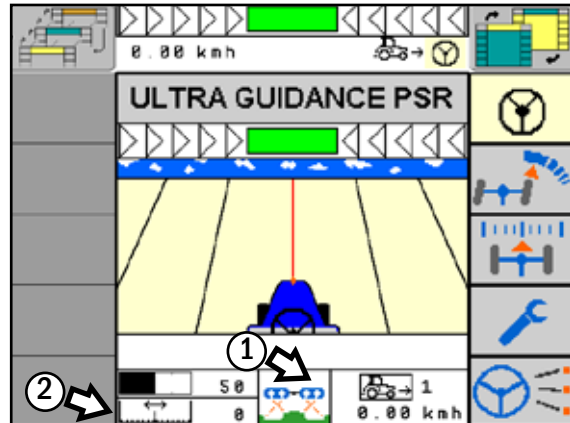


Fig. 183: Tramline intersection

#### Adjust Sensors

The sensors need to be adjusted as shown in Fig. 184. Make sure that the sensors do exactly hit the inside of the reference edge.

Depending on the type of application, it may be sensible to mount the sensors in staggered rows rather than next to each other. The reference edge can thus be captured twice in order to obtain the required accuracy. This may be the case e.g. during sowing along marker track.

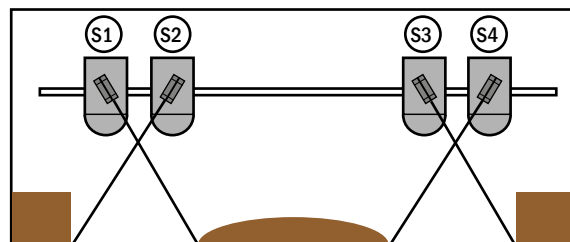


Fig. 184: Adjusting the sensors for tramline intersection

### 7.3.2 Tramline outside

Select the “Tramline intersection” operation mode as described in Chapter 4.4 (see Fig. 185 – 1).

In the “Tramline outside” operation mode, distance (see Fig. 185 - 2) describes a lateral displacement of the vehicle from the leading line to the left or to the right.

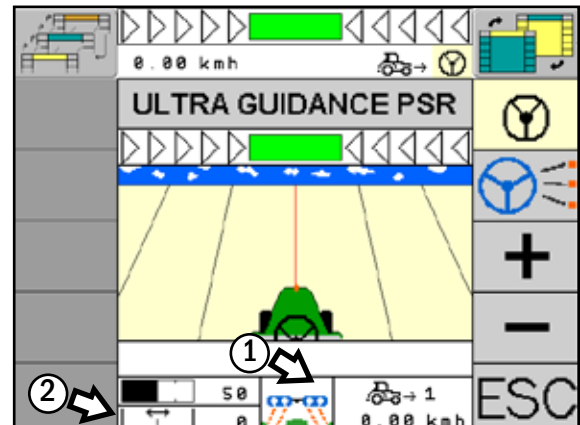


Fig. 185: Tramline outside

#### Adjust Sensors

The sensors need to be adjusted as shown in Fig. 186. Make sure that the external sensor hits the upper third and the internal sensor hits the lower third of the reference edge.

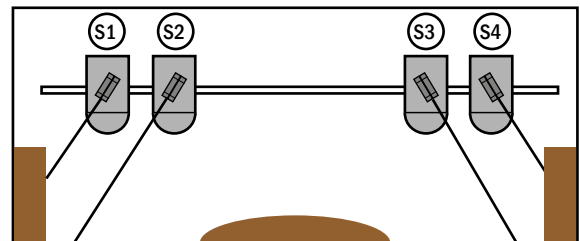


Fig. 186: Adjusting the sensors for tramline outside

### 7.3.3 Swath Center and Swath with Alternation

Select the “Swath center” or “Swath with alternation” operation mode as described in Chapter 4.4 (see Fig. 187 – 1).

In the “Swath center” or “Swath with alternation” operation mode, distance describes a lateral displacement of the vehicle from the leading line to the left or to the right (see Fig. 187 -2).

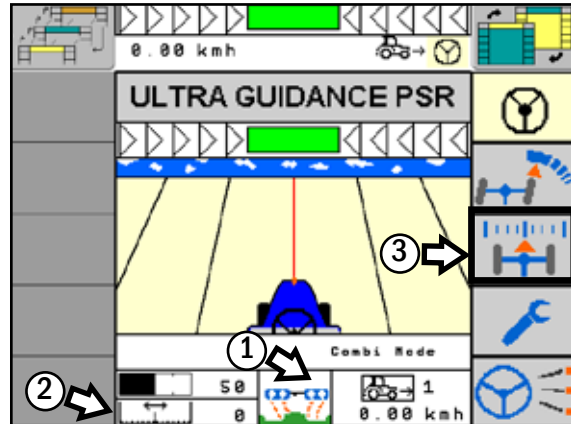


Fig. 187: Swath center and swath with alternation

Briefly press the “Distance setting” function key (see Fig. 187 – 3) to select from the “Swath center” (see Fig. 188 – 1) and “Swath with alternation” operation modes (see Fig. 188 – 2).



Fig. 188: Switching between swath center and swath with alternation

#### Adjust Sensors

The sensors need to be adjusted as shown in Fig. 189. Make sure that the external sensors scan the bottom edge of the swath and the internal sensors capture the upper area.

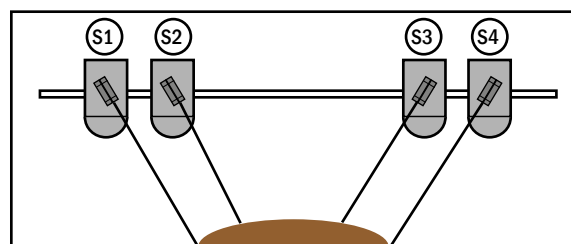


Fig. 189: Sensor settings for swath center and swath with alternation

### 7.3.4 Crop Edge

Select the “Crop edge” operation mode as described in Chapter 4.4 (see Fig. 190 – 1).

In the “Crop edge” operation mode, distance (see Fig. 190 – 2) describes the average distance between the left (S1 and S2) or right sensor pair (S3 and S4) (see Fig. 191) and the respective crop edge.

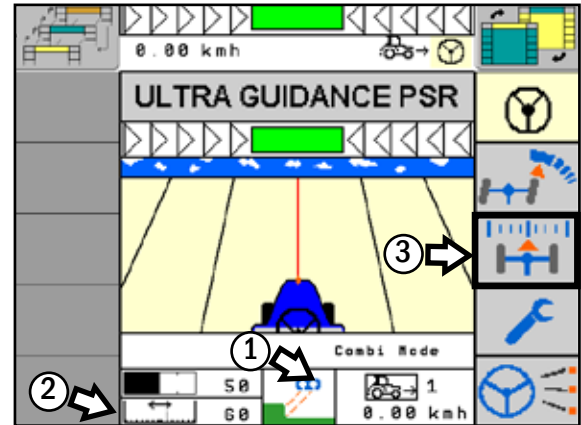


Fig. 190: Crop edge

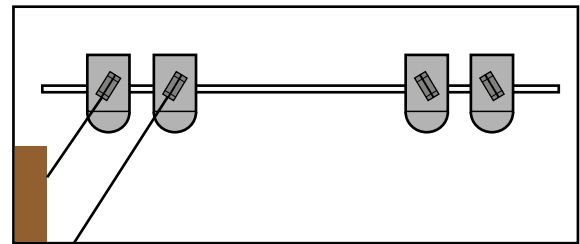


Fig. 191: Adjusting the sensors for (left) crop edge

Briefly press the “Distance setting” function key (see Fig. 190 – 3) to switch between left (see Fig. 192 – 1) and right crop edge (see Fig. 192 – 2).

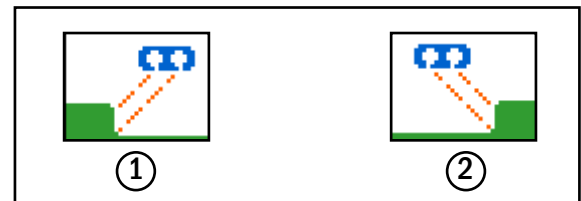


Fig. 192: Switching between left and right crop edge

#### Adjust Sensors

The sensors need to be adjusted as shown in Fig. 193. Make sure that the external sensor captures the upper third and the internal sensor captures the lower third of the reference edge.

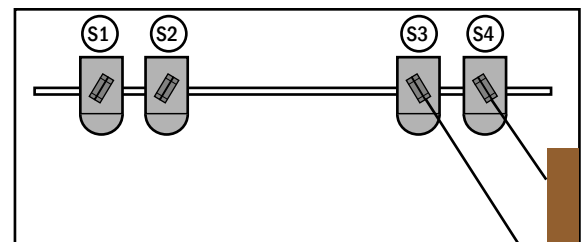


Fig. 193: Adjusting the sensors for (right) crop edge

### 7.3.5 Crop Edge Crosswise

Select the “Crop edge crosswise” operation mode as described in Chapter 4.4 (see Fig. 194 – 1).

In the “Crop edge crosswise” operation mode, distance (see Fig. 194 – 2) describes a lateral displacement of the vehicle from the leading line to the left or to the right.

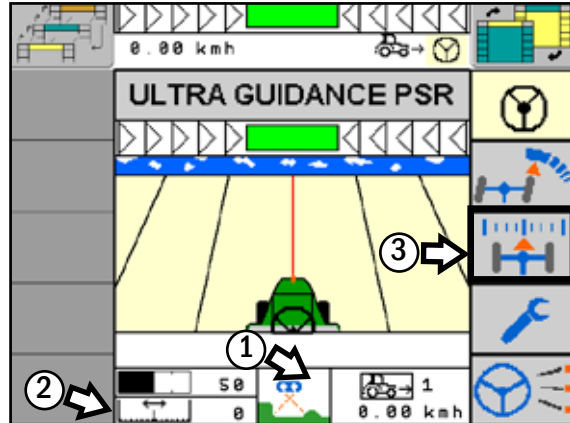


Fig. 194: Crop edge crosswise

Briefly press the “Distance setting” function key (see Fig. 194 – 3) to switch crosswise from left (see Fig. 195 – 1) to right crop edge (see Fig. 195 – 2).

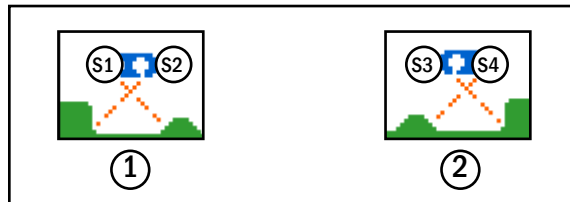


Fig. 195: Switching between left and right crop edge crosswise

#### Adjust Sensors

The sensors need to be adjusted as shown in Fig. 196 and Fig. 197. Make sure that the sensors are exactly oriented towards the inside of the reference edge.

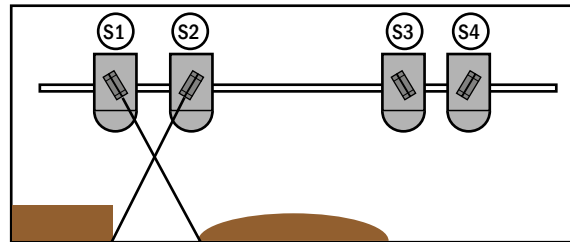


Fig. 196: Adjusting the sensors for crop edge crosswise (left)

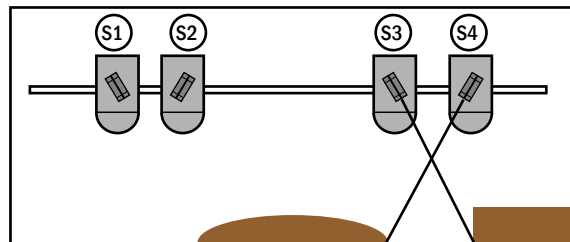


Fig. 197: Adjusting the sensors for crop edge crosswise (right)



### 7.3.6 Crop Edge with Correction

Select the “Crop edge with correction” operation mode as described in Chapter 4.4 (see Fig. 198 – 1).

In the “Crop edge with correction” operation mode, distance (see Fig. 198 – 2) describes the distance between the external sensor (S1 or S4) and the reference edge (see Fig. 199).

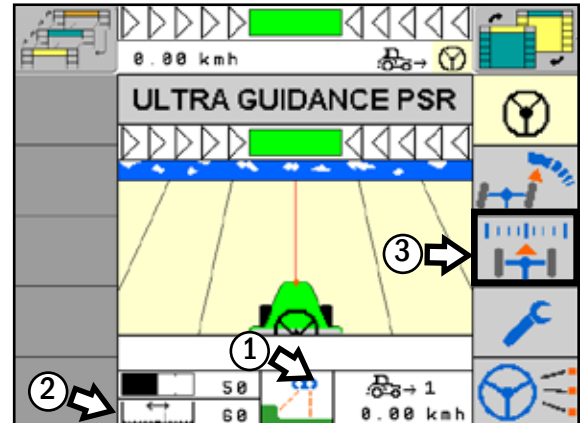


Fig. 198: Crop edge with correction

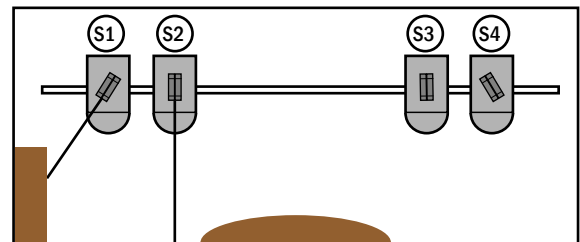


Fig. 199: Adjusting the sensors for crop edge with correction (left)

Briefly press the “Distance setting” function key (see Fig. 198 – 3) to switch crosswise from left (see Fig. 200 – 1) to right crop edge with correction (see Fig. 200 – 2).

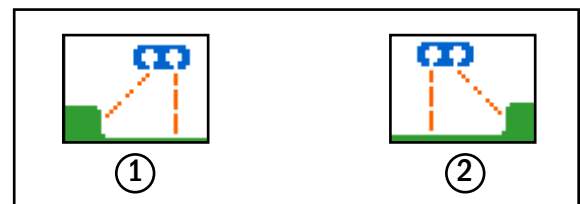


Fig. 200: Switching between left (1) and right (2) crop edge with correction

#### Adjust Sensors

The sensors need to be adjusted as shown in Fig. 199 and in Fig. 201. Make sure that the internal sensors (S2 and S3) are vertically oriented downwards. The external sensors (S1 and S4) must be oriented towards the center of the reference edge.

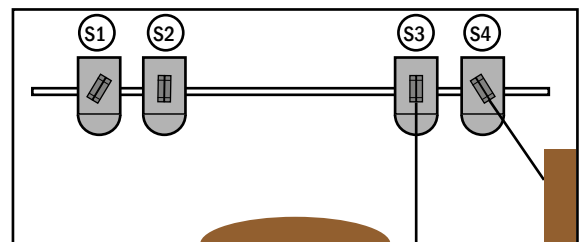


Fig. 201: Adjusting the sensors for crop edge with correction (right)

## 7.4 Adjust PSR SONIC

After selecting the PSR SONIC operation mode, you need to make further settings in the “SONIC Configuration” in the menu. Call up the SONIC configuration from the PSR mask as described in Chapter 7.2.2.

The first line of the menu page shows the existing sensors and the current values (see Fig. 202).

The other menu points are described in the following subchapters.

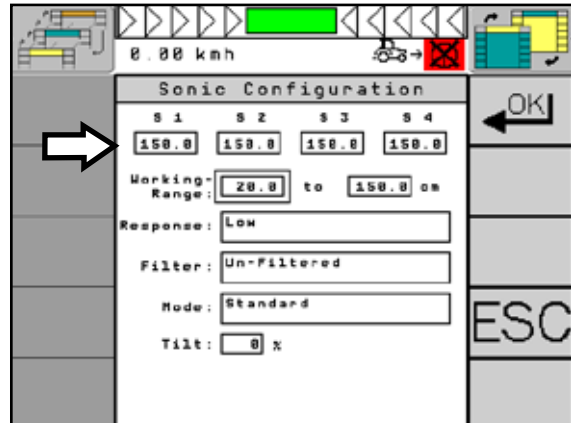


Fig. 202: SONIC configuration

### 7.4.1 Working Area

The working area is the area where data for automatic steering are used. Data from outside the area are discarded.

Select the “Working Range” button. First of all, set the minimum value and then the maximum value (see Fig. 203). Proceed as described in Chapter 5.1.2.

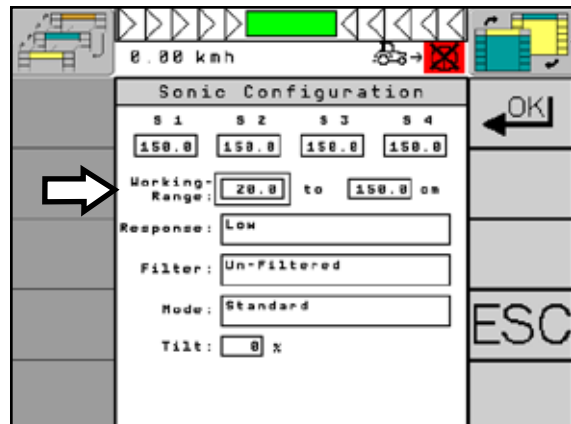


Fig. 203: Adjustment of the working range

### 7.4.2 Response

By using the “Response” function, you can adjust how strongly/aggressively the vehicle shall react to a deviation of the SONIC sensors from the reference line.

Select the “Response” button (see Fig. 204).

You can select between the levels “Low” (the response of the vehicle to a deviation is lower), “Medium” (the response of the machine is normal) and “High” (the machine responds even in case of slight deviations) (see Fig. 205).

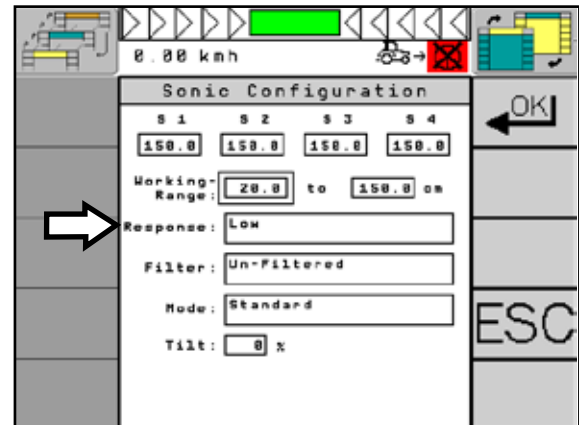


Fig. 204: Adjustment of the response



Fig. 205: Selection of the response

### 7.4.3 Filter

The “Filter” function specifies how the system shall react and/or how the machine shall steer in case of gaps in the crops or measurement failures.

Select the “Filter” button (see Fig. 206).

You can select from (see Fig. 207):

- Un-Filtered:  
The previously defined maximum value of the working area will be applied in case of a measurement gap.
- Last Valid Value:  
The last measured value is applied.

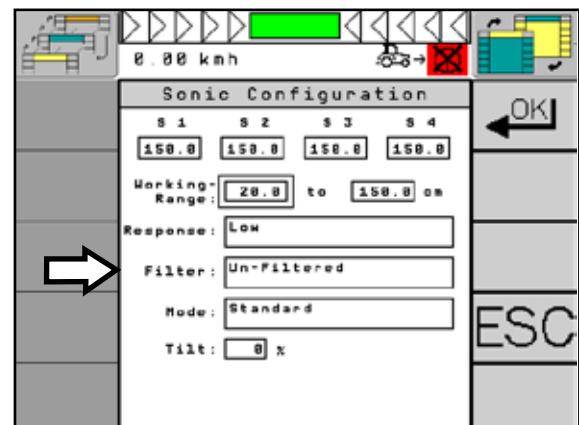


Fig. 206: Adjustment of the filter

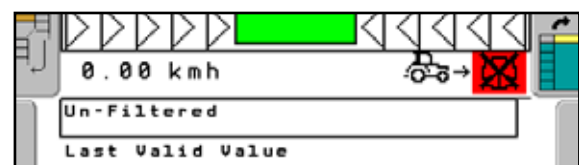


Fig. 207: Selection of the filter

The Fig. 208 shows the case of a gap in the crops. When the “Last Valid Value” filter setting is selected, the system returns to the value of the last possible measurement (see Fig. 208 - 1). The vehicle will not steer (see Fig. 208 - 2).

When the “Un-Filtered” filter setting is selected, the system returns to the previously defined maximum value (in this case “150 cm”/”236 ¼inch”). The vehicle will not steer slightly (see Fig. 208 - 3).

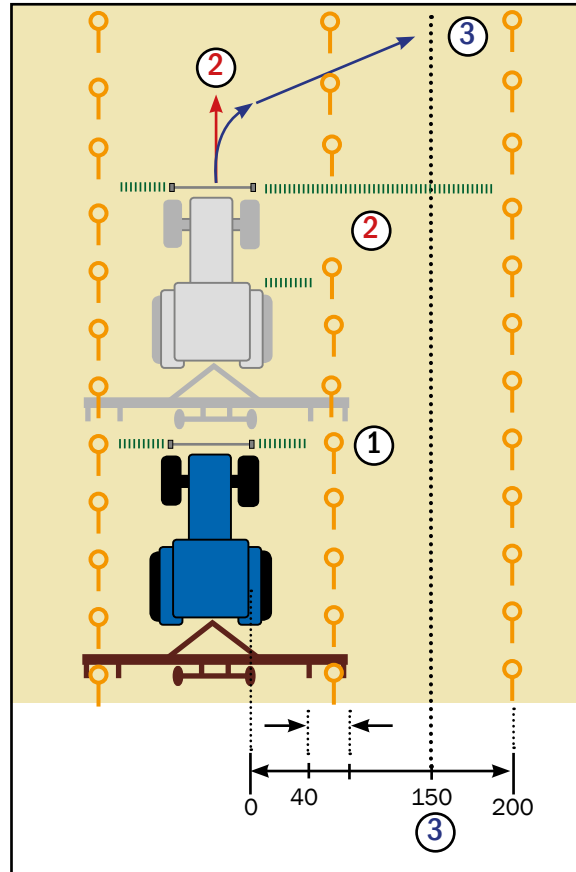


Fig. 208: Filter example sketch

#### 7.4.4 Mode

In the “Mode” function, you specify how you want to use PSR SONIC. You can use PSR SONIC independently, as sensor travel or in combination with PSR SKY (with GPS support).

Select the “Mode” button (see Fig. 209).

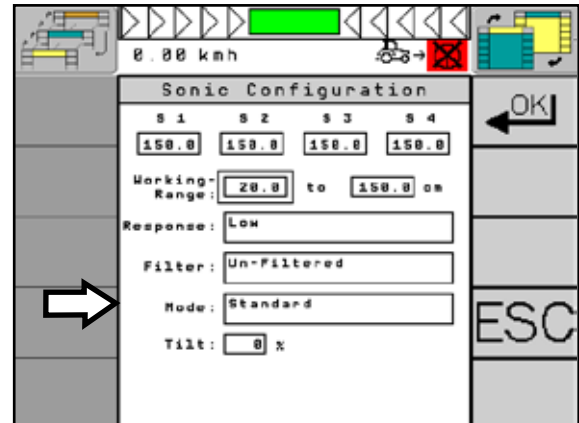


Fig. 209: Setting the mode

You can select between standard mode (only PSR SONIC), combi mode (combination of PSR SONIC and PSR SKY) and the Sensor+ mode (see Fig. 210).

Standard mode designates a mere sensor travel.

The combi mode is the interaction of PSR SONIC and PSR SKY. It enables clean and low-loss entering into the next track with PSR SKY after turning at the end of the field. On the field, you work with the set PSR SONIC operation mode.

The Sensor+ mode is a combination of PSR SONIC and PSR SKY as well. Similar to the creation of an A-B line, the heading must be entered here, the lateral offset is given by the sensor (see Fig. 211).

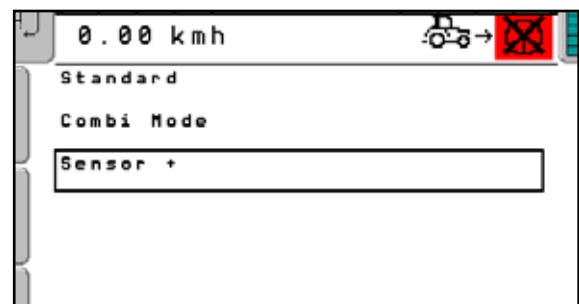


Fig. 210: Mode selection

**NOTICE**

The Sensor+ mode is available only in the crop edge operation mode.

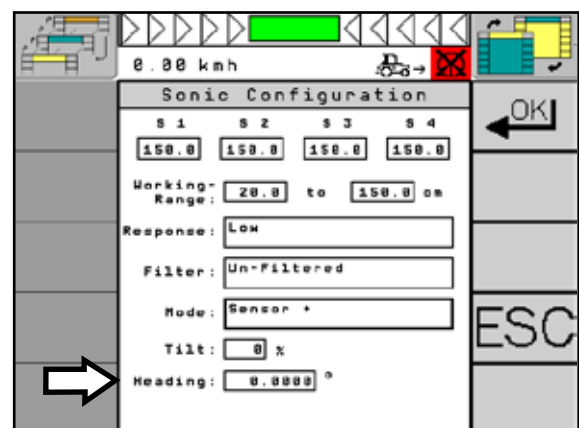


Fig. 211: Select/set heading

If the combi mode is selected, the exact working width must be set additionally (see Fig. 212).

In contrast to PSR SKY, it is not necessary to define an overlap.

Select the “Width” button and enter the exact value. Proceed as described in Chapter 5.1.2.

In the standard mode, the functions “Width” and “Heading” are hidden.

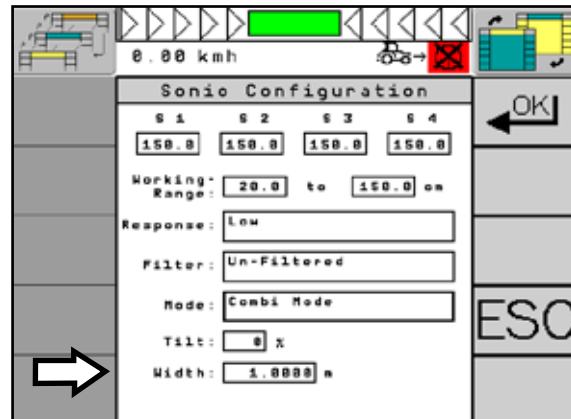


Fig. 212: Set working width

### 7.4.5 Tilt Sensor

The values of the tilt sensors of ULTRA GUIDANCE PSR ISO can be transmitted to the sensors of PSR SONIC.

**NOTICE**

Use the “Tilt” function especially for works on slopes.

Via the “Tilt” setting, you can set the percentage proportion of the tilt sensor values being transmitted.

Select the “Tilt” button (see Fig. 213) and set the desired value. Proceed as described in Chapter 5.1.2.

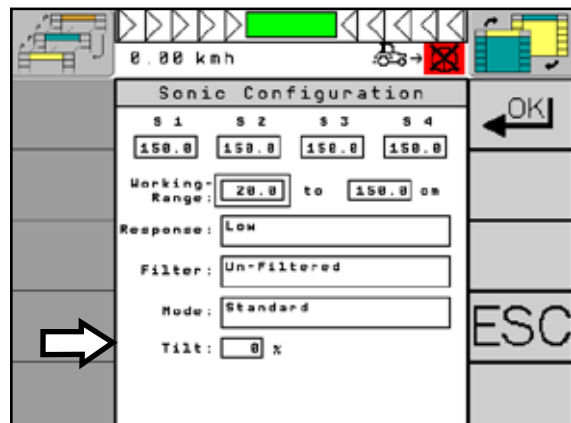


Fig. 213: Set tilt

## 8 PSR TAC

PSR TAC is steering with a flexible tactile sensor by scanning of plant rows. Thanks to the sensors, the vehicle will be guided exactly along the rows.

### 8.1 PSR TAC – application-specific changes/vehicle changes: Mount and Set Sensors

Upon commissioning, the sensor is installed ready for operation (see Fig. 214).

When the attachment is changed, you only need to connect the plug of the sensor connection cable with the vehicle-depending plug connection (e.g. front socket or Deutsch connector) of the vehicle.

**NOTICE**

The execution of the assembly individually depends on the vehicle. If you have any questions concerning the mounting or re-assembly on another vehicle, please refer to your retailer or Reichhardt.

If the sensor is mounted to a special bracket, the entire bracket including sensor must be reassembled (see Fig. 215).

**NOTICE**

If you use a separate sensor bracket, you require the respective installation instructions of the bracket to remount it to another vehicle. You can obtain these from your retailer or from Reichhardt.

**NOTICE**

If you have problems with the assembly, please contact your retailer or Reichhardt.



Fig. 214: PSR TAC sensor ready for operation



Fig. 215: PSR TAC sensor in operation

## 8.2 Main Screen/TAC Configuration

Via the operation mode main menu, you can adjust PSR TAC to meet your requirements. The menu is clearly summarized on one page.

### 8.2.1 PSR TAC Main Screen

If PSR TAC operation mode is selected, you can find information on the current TAC operation mode in the information field of the PSR mask (see Fig. 216).

In the PSR TAC operation mode, distance describes a lateral displacement of the vehicle from the leading line to the left or to the right.



Fig. 216: Main screen with information field in the combi mode

### 8.2.2 TAC Configuration

With "PSR TAC" operation mode selected, briefly press the "Main menu" key (see Fig. 217) to get to the main menu of the "TAC Configuration" mode.

On the menu side of the TAC Configuration, you can make different device settings (see Fig. 218).

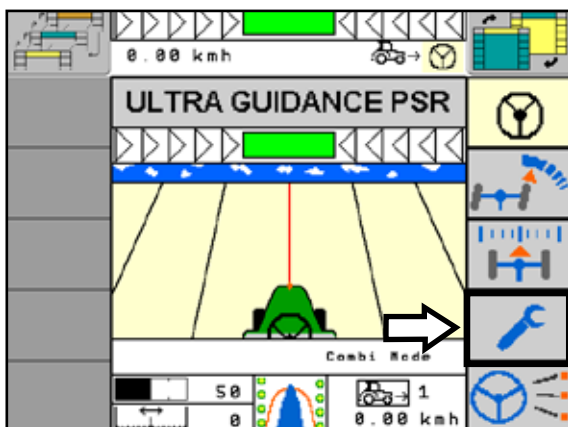


Fig. 217: Main menu

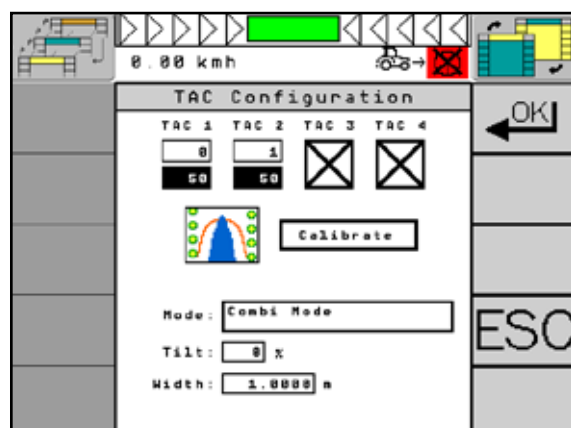


Fig. 218: Overview menu page



### 8.3 PSR TAC Operation Mode

PSR TAC offers the following operation modes:



#### **One TAC Sensors**

Steering guided by means of a closed row crop line, e.g. corn row.



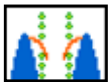
#### **Two TAC Sensors, Version "right"**

Steering guided by means of a tramline with two row crop lines. Only the TAC sensor in the right side is used as leading line.



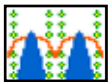
#### **Two TAC Sensors, Version "left"**

Steering guided by means of a tramline with two row crop lines. Only the TAC sensor in the left side is used as leading line.



#### **Two TAC Sensors, Version "internal"**

Steering guided by means of two random row crops with one-sided internal scanning.



#### **Two TAC Sensors**

Uses two row crop lines as guidance.

IN case of gaps in the crops, the steering behavior can be improved thanks to the second TAC sensor.

## 8.4 Adjust PSR TAC

With “PSR TAC” operation mode selected, briefly press the “Main menu” key (see Fig. 219) to get to the main menu of the “TAC Configuration” mode.

The upper area of the menu page shows the existing sensors.

- The first line shows the current value of the sensors (see Fig. 219 – 1).
- The second line shows the saved value (see Fig. 219 – 2).

The other menu points are described in the following.

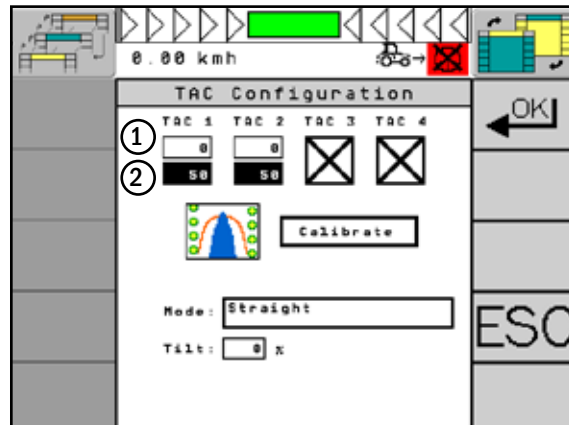


Fig. 219: Display of sensor values

### 8.4.1 PSR TAC Operation Mode

Select the “Operation mode” button (see Fig. 220).

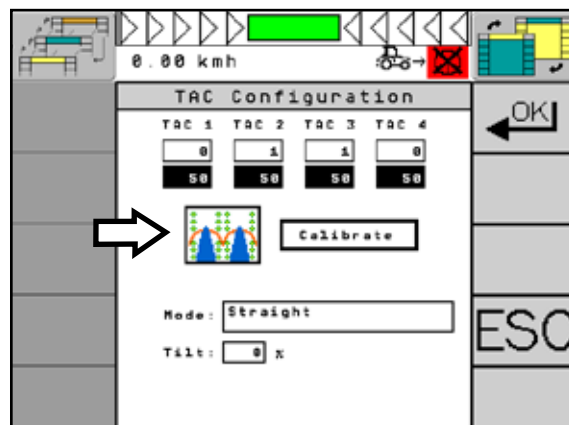


Fig. 220: Set operation mode

Select the desired PSR TAC operation mode (see Fig. 221 and Chapter 8.3).

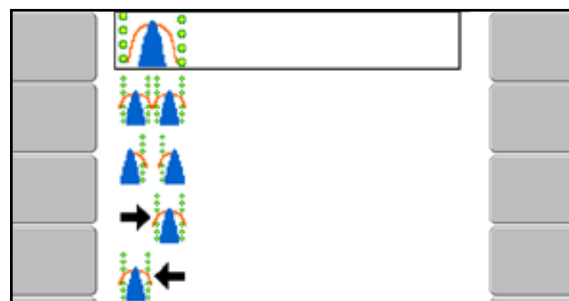


Fig. 221: Overview operation mode

### 8.4.2 Calibrate TAC Sensor

To get consistently good results with PSR TAC, it is required to recalibrate it periodically. This is especially important when the TAC sensor is used for the first time or after lengthy periods of no use.

**NOTICE**

Ensure that the plastic buttons of the sensors are at rest position and are neither pushed nor moved. The displayed value shall be between 40 and 70.

Press the “Calibrate” button ( see Fig. 222). The connected TAC sensor(s) are simultaneously calibrated.

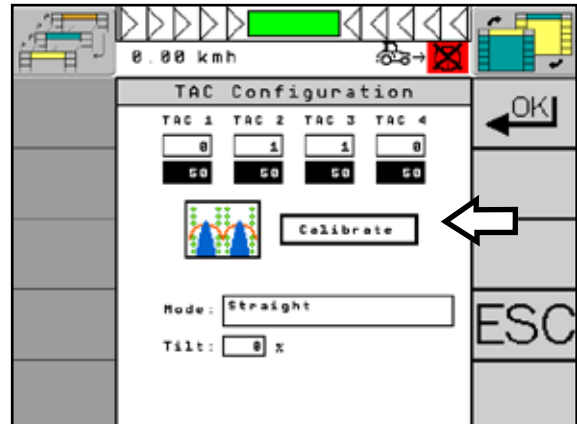


Fig. 222: Calibrate TAC sensor

### 8.4.3 Mode

By selecting the mode, you determine in which way the system interprets the values of the TAC sensor. You can select between “Straight” and “Curve”. Select the mode in accordance with the individual purpose.

The “Straight” mode optimizes the system to achieve an optimum result on straight tracks.

The “Curves” mode optimizes the system to better follow curves which is perfectly suited for fields laid out in curve contours or circles.

You can additionally set the “Combi Mode” as third selection option.

The combi mode is the interaction of PSR TAC and PSR SKY. It enables clean and low-loss entering into the next track with PSR SKY after turning at the end of the field. On the field, you work with the set PSR TAC operation mode.

Press the “Mode” button (see Fig. 223).

Select the desired mode using the selection button of the terminal (see Fig. 224).

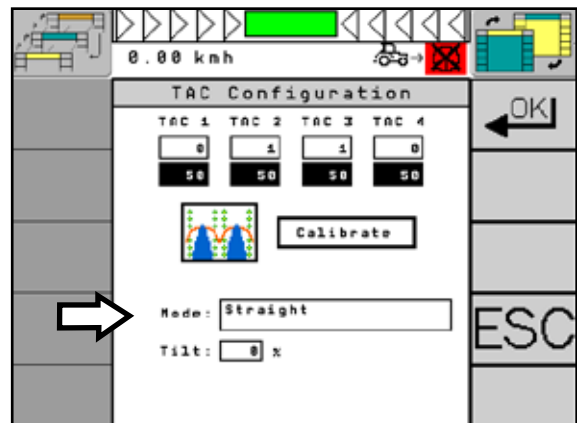


Fig. 223: Function mode

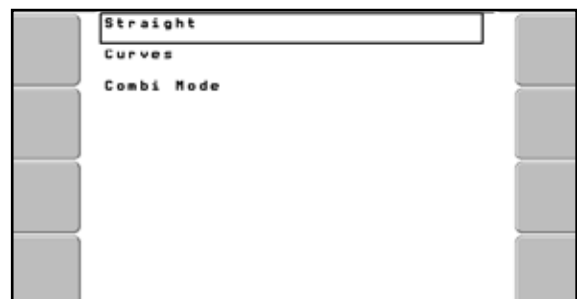


Fig. 224: Mode selection

### Set Working Width

If the combi mode is selected, the exact working width must be set additionally.

In contrast to PSR SKY, it is not necessary to define an overlap.

Select the “Working width” button (see Fig. 225) and enter the exact value. Proceed as described in Chapter 5.1.2.

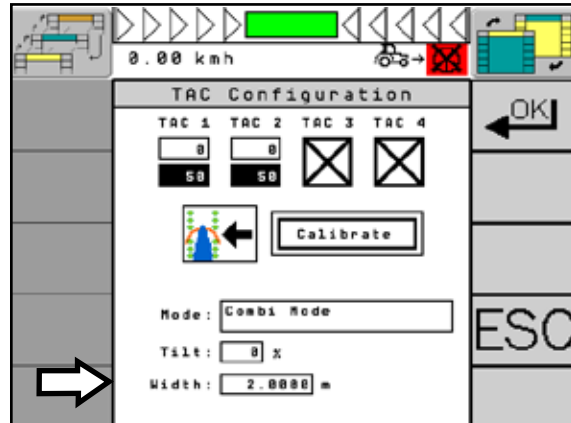


Fig. 225: Set working width

### 8.4.4 Tilt Sensor

The values of the tilt sensor of ULTRA GUIDANCE PSR ISO can be transmitted to the sensors of PSR TAC.

**NOTICE**

Use the “Tilt” function especially for works on slopes.

Via the “Tilt” setting, you can set the percentage proportion of the tilt sensor values being transmitted.

Select the “Tilt” button (see Fig. 226) and set the desired “Tilt” value.

Proceed as described in Chapter 5.1.2.

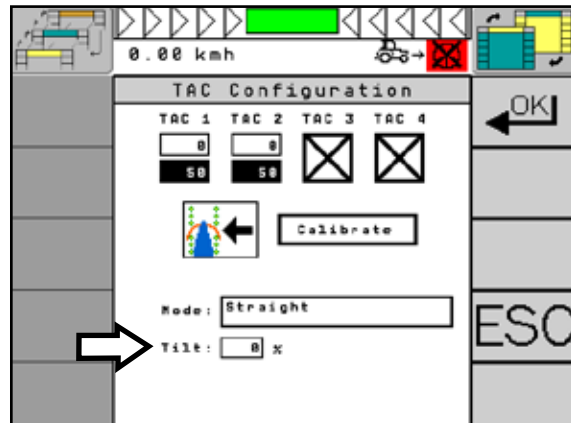


Fig. 226: Set tilt

## 9 PSR MEC and PSR MEC+

PSR MEC and MEC+ enables steering with a mechanical row finder. Thanks to the scanner, the vehicle will be guided exactly along the rows.

### 9.1 PSR MEC/PSR MEC+ – Application-specific Changes/Vehicle Changes: Mount Sensors

Upon commissioning, the mechanical scanners PSR MEC and PSR MEC+ are mounted ready for operation on the vehicle (see Fig. 227). Usually, PSR MEC and PSR MEC+ are mounted to the vehicle by means of a special bracket (see Fig. 228). This bracket is often mounted to the front of the vehicle.

**NOTICE**

Mounting the bracket to the vehicle may be different for all vehicle types.

When changing the vehicle, you need to loosen the vehicle-dependent plug connection of the PSR MEC connection cable first.

**CAUTION**

**Risk of crushing!**  
Due to its high dead weight, the mechanical scanner PSR MEC/PSR MEC+ may cause crushing of the skin by sliding back into the bracket. If possible, have the mechanical row finder pulled out of the bracket by two persons or secure it against slippage from below.

Now release the screw connection on the bracket and pull the mechanical row finder from the bracket.

When using the PSR MEC+ on the vehicle front, an additional bracket element will be required (see Fig. 229).

**NOTICE**

The fixture of the bracket may individually depend on the vehicle. If you have any questions concerning the assembly or reassembly on another vehicle, please refer to your retailer or Reichhardt.

Mounting on another vehicle shall be carried out in reverse order.

**NOTICE**

If you have problems with the assembly/setting, please contact your retailer or Reichhardt.



Fig. 227: PSR MEC and MEC+ ready for operation



Fig. 228: Mount/dismount PSR MEC



Fig. 229: Mount/dismount PSR MEC+

## 9.2 Main Screen/TAC Configuration

You can adjust PSR MEC/PSR MEC+ via the operation mode main menu to meet your requirements. The menu is clearly summarized on one page.

### 9.2.1 PSR MEC Main Screen

When the PSR MEC operation mode is activated, you can obtain information on the current operation from the second line of the information field of the PSR mask. (see Fig. 230).

The area on the right side of the information field (driving direction and speed) is only active in the combi mode and in the Sensor+ mode.



Fig. 230: Main screen with information field in the combi mode

### 9.2.2 PSR MEC Configuration

With “PSR MEC” operation mode selected, briefly press the main menu button (see Fig. 231) to get to the “MEC Configuration”.

On the menu side of the MEC configuration, you can make different device settings (see Fig. 232).

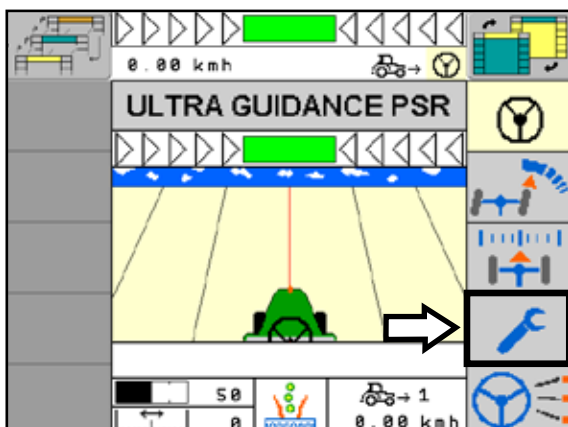


Fig. 231: Main menu

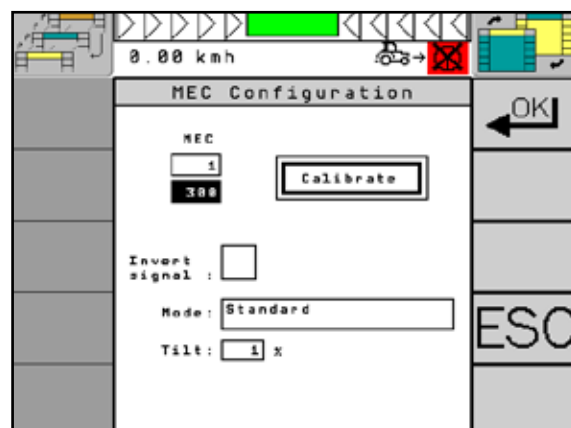


Fig. 232: Overview menu page

### 9.3 Setting PSR MEC/MEC+

After calling up the “MEC Configuration” via the “Main menu” function button of the PSR mask, you can adjust PSR MEC/PSR MEC+ to meet your requirements.

Any further settings refer to PSR MEC as well as to PSR MEC+. Therefore, these will be referred to as PSR MEC or MEC only in the following.

The upper area of the menu page shows the existing sensor (see Fig. 233).

- The first line shows the current value of the sensors (see Fig. 233 – 1).
- The second line shows the saved value (see Fig. 233 – 2).

The other menu points are described in the following.

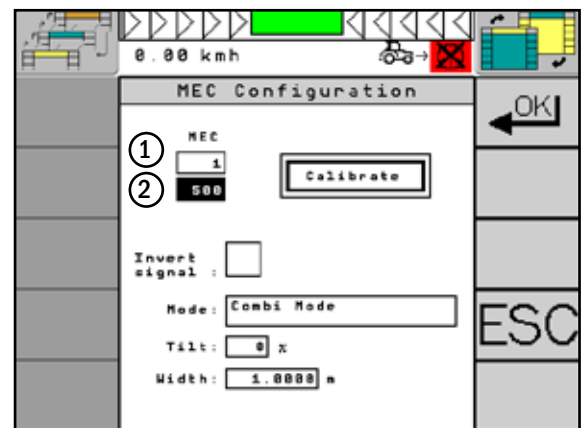


Fig. 233: Display sensor value

#### 9.3.1 Calibrate PSR MEC

To get consistently good results with the mechanical scanner MEC, it is required to recalibrate it periodically. This is especially important when the MEC is used for the first time or after lengthy periods of no use.

**NOTICE**

Ensure that the MEC is at rest position and is neither pushed nor moved.

Press the “Calibrate” button (see Fig. 234). The connected MEC is calibrated.

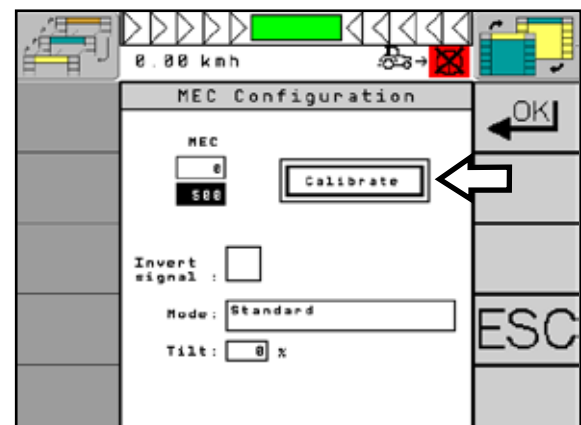


Fig. 234: Calibrate PSR MEC



### 9.3.2 Signal Inversion

Depending on the installation position of the PSR MEC (oriented backwards, possibly turned by 180° due to lack of space), it may become necessary to invert the received signal. If the sensor e.g. steers to the left and the vehicle to the right, you need to invert the signal.

Select the “Invert signal” checkbox (see Fig. 235). The determined value is now inverted.

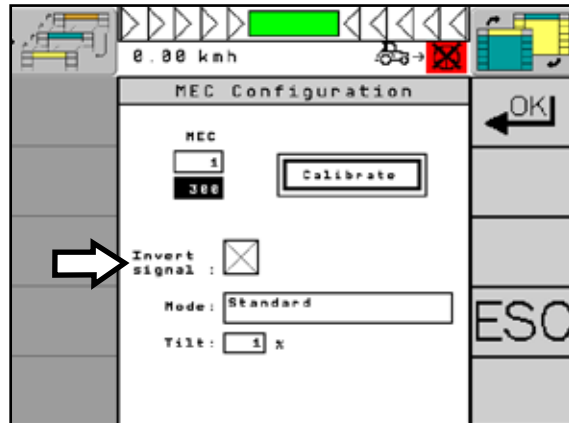


Fig. 235: Direction of the signal

### 9.3.3 Mode

In the “Mode” function, you specify how you want to use PSR MEC. You can use PSR MEC independently, as sensor travel or in combination with PSR SKY with GPS support.

Select the “Mode” button (see Fig. 236).

You can select between standard mode (only PSR MEC) and combi mode (combination of PSR MEC and PSR SKY) (see Fig. 237).

Standard mode designates a mere sensor travel.

The combi mode is the interaction of PSR MEC and PSR SKY. It enables clean and low-loss entering into the next track with PSR SKY after turning at the end of the field. On the field, steering is carried out with PSR MEC only.

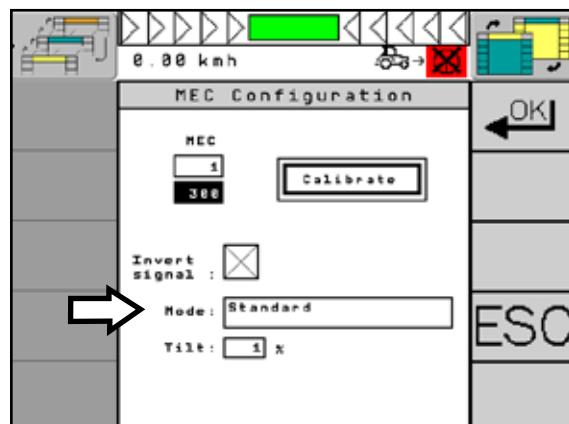


Fig. 236: Function mode

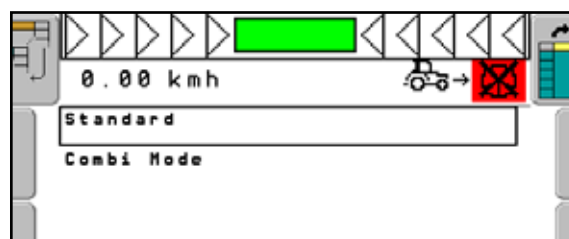


Fig. 237: Mode selection



### Set Working Width

If the combi mode is selected, the exact working width must be set additionally (see Fig. 238). In contrast to PSR SKY, it is not necessary to define an overlap.

Select the “Working width” button and enter the exact value. Proceed as described in Chapter 5.1.2.

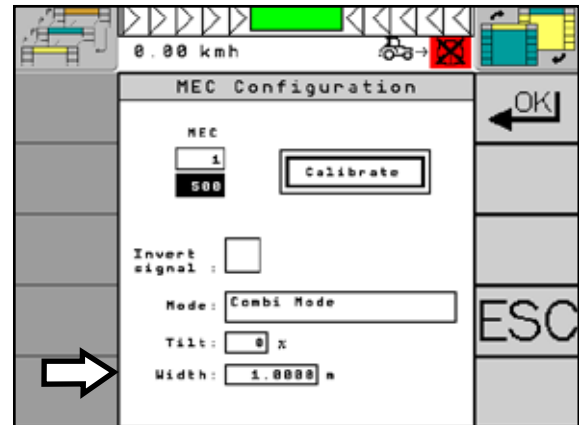


Fig. 238: Set Working Width

### 9.3.4 Tilt Sensor

The values of the tilt sensor of ULTRA GUIDANCE PSR ISO can be transmitted to the sensors of PSR MEC.

**NOTICE**

Use the “Tilt” function especially for works on slopes.

Via the “Tilt” setting, you can set the percentage proportion of the tilt sensor values being transmitted.

Select the “Tilt” button and set the desired “Tilt” value (see Fig. 239). Proceed as described in Chapter 5.1.2.

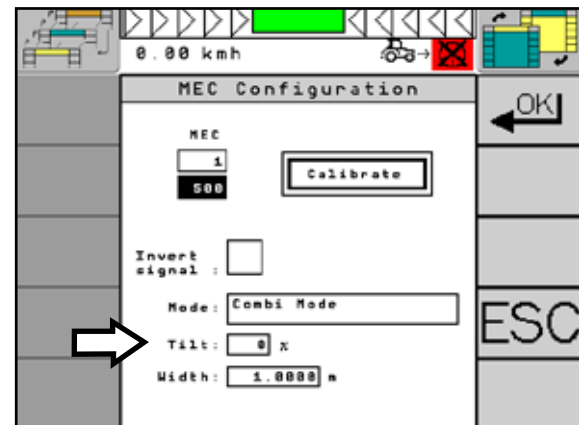


Fig. 239: Set tilt



## 10 Advanced Functions

### 10.1 Combi Mode

The simultaneous use of a sensor travel in combination with PSR SKY enables a clean and rational entering into the new track after turning at the end of the row.

Works in the crop are carried out with the preferred sensor operation. After turning at the end of the row, PSR SKY will guide the vehicle – reliably and without any loss of time – exactly onto the new track in accordance with the previously set working width.

#### Example: Spraying Corn with PSR TAC

After turning at the end of the row, PSR SKY takes over the entering into the next track. Counting and marking the rows can thus be omitted (see Fig. 240).

The combination can be switched on or off for each sensor operation.

#### NOTICE

If the combi mode is activated, switching between automatic operation and “Steering by wire” is no longer possible.

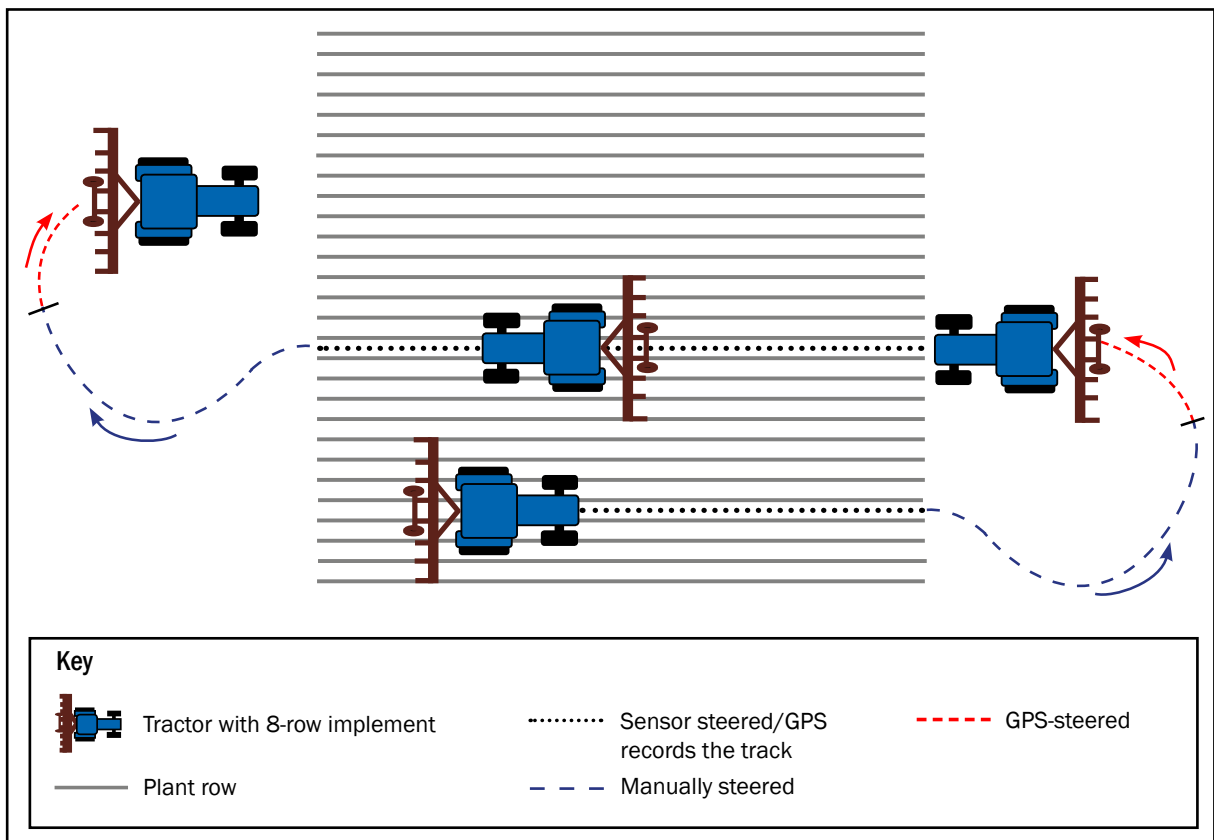


Fig. 240: Combi mode: Example spraying corn with PSR TAC

In the top line of the information fields of the PSR mask, “Combi mode” indicates that the combination for the sensor operation is activated (see Fig. 241).



Fig. 241: Combi mode display

### Semi-automatic Switching between Sensor Operation and PSR SKY

Drive through the rows of the field as usual using the sensor operation (see Fig. 242). Grasp the wheel when you reach the headland in order to deactivate the automatic steering. Start the turning procedure.

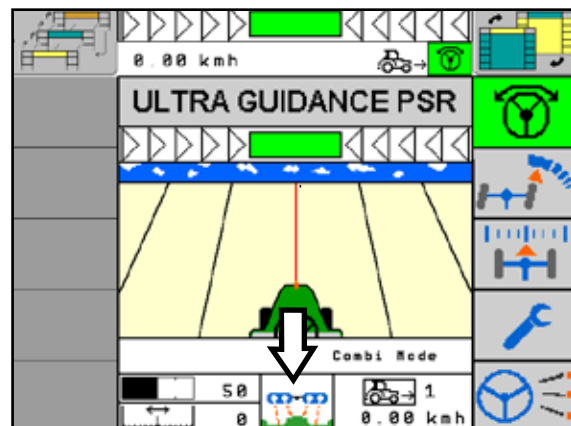


Fig. 242: Semi-automatic switching between sensor operation and PSR SKY sensor switched

The system automatically switches to PSR SKY operation (see Fig. 243), when you enter the next track. You will hear a beep sound. Now activate ULTRA GUIDANCE PSR ISO. The steering system will now take over the entering into the next track.

#### NOTICE

If you will not enter the next track within 45 seconds after deactivating the steering system, the automatic switch to PSR SKY will not be carried out.

Drive a distance of at least 30m using a sensor operation when the steering system is active. Otherwise, the automatic switching will not be activated.



Fig. 243: Semi-automatic switching between sensor operation and PSR SKY - GPS

The system independently switches to the previously used sensor operation (see Fig. 244), as soon as the vehicle is on the new track.

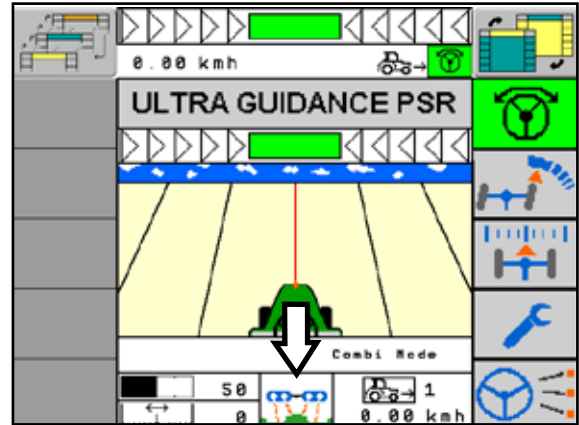


Fig. 244: Switch back to sensor operation

### Manual Switching between Sensor Operation and PSR SKY

In certain situations, it will be advantageous to manually activate and maintain PSR SKY operation. If e.g. there is an obstacle on the current track or if you want to refill the tank of the spraying device, it is helpful to be steered to the current track automatically.

Press the "Operation setting" function key in order to switch from the sensor operation to PSR SKY (see Fig. 245).

#### NOTICE

If you have switched the operation mode, the system will not switch back to sensor operation automatically. You need to do this manually.

Drive a distance of at least 30m using a sensor operation when the steering system is active. Otherwise, the manual switching will not be activated.

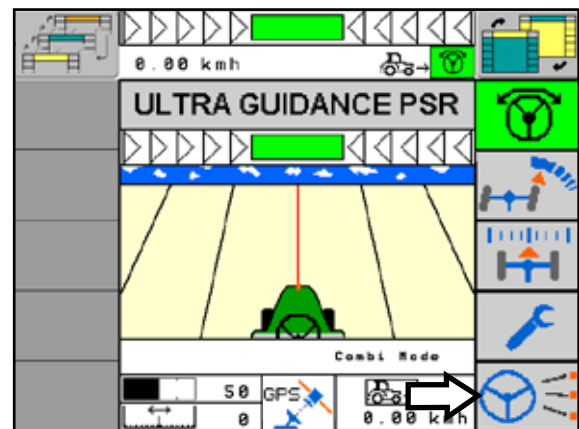


Fig. 245: Manual switching between sensor operation and GPS

Press the “Operation setting” function key again in order to switch from PSR SKY to the last sensor operation (see Fig. 246).

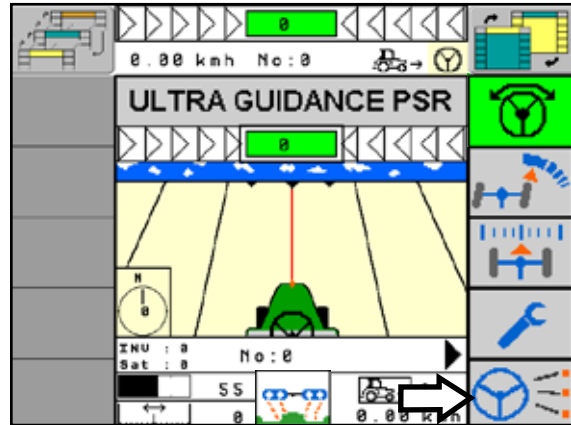


Fig. 246: Switch back to previous operation

## 10.2 Sensor+ mode

### NOTICE

The “Sensor+” mode is available only in the crop edge operation mode.

The “Sensor+” mode (see Fig. 247 – 1) is a combination of PSR SONIC and PSR SKY as well, however the cardinal direction must be entered similar to the creation of an A-B line, the lateral offset is determined by the sensor (see Fig. 247 – 2). Enter the cardinal direction as described in Chapter 5.1.2.

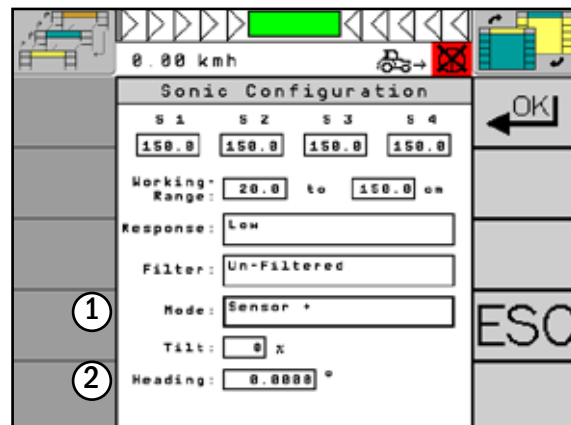


Fig. 247: Sensor+ activated

### 10.3 Use of the PSR Joystick

With the PSR joystick, you can activate/deactivate the steering system or switch between functions. Moreover, you can control the vehicle in the manual mode.

The joystick can be mounted at any point in the vehicle cabin (see Fig. 248).



Fig. 248: PSR joystick in the vehicle

In addition to the normal axle function, the PSR joystick has two buttons, one on the front (dead-man switch) (see Fig. 249 – 1) and one on top (top button) (see Fig. 249 – 2).

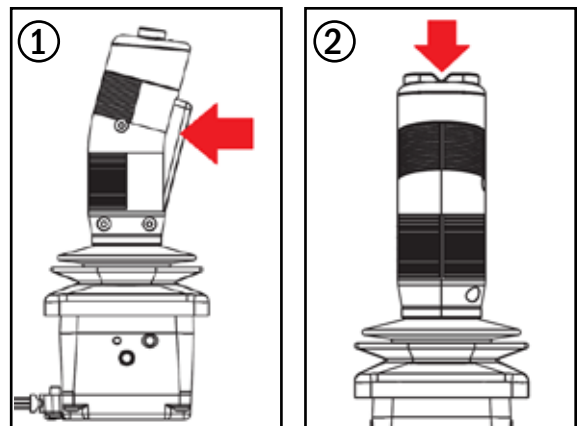


Fig. 249: Buttons of the PSR joystick

The PSR joystick has two functions (tractor and implement) (see Fig. 250).

In manual mode of ULTRA GUIDANCE PSR ISO in the “Tractor Steering” function, it is possible to steer manually using the joystick when the dead-man switch is pressed. When the dead-man switch is released, the steering switches back to automatic mode, but will remain deactivated. The top button is used as activation switch.

In the “Implement Steering” function, with active steering and without pressing the dead-man switch, you set the sliding distance (nudging). Using the dead-man switch, you can switch between manual and automatic mode. If the steering is in manual mode and the dead-man switch is not pressed, you can steer manually.

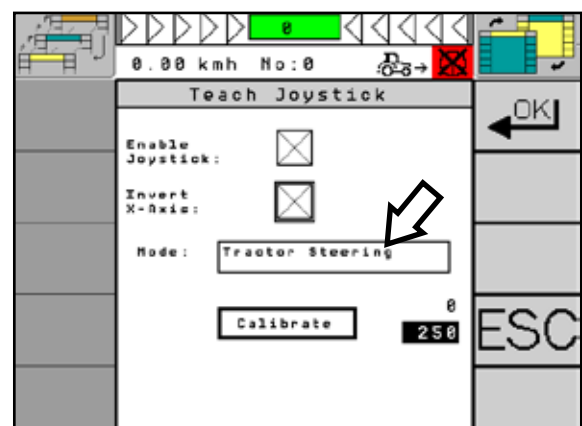


Fig. 250: Set PSR joystick

## 10.4 AUX-N Functionality

ULTRA GUIDANCE PSR ISO supports the use of AUX-N devices and functions such as the Reichhardt ISO CONTROL joystick (see Fig. 251).

By using AUX-N devices, ULTRA GUIDANCE PSR ISO allows for setting the distance (nudging – activate/deactivate) (cf. Chapter 6.6) and reaction (set reaction level) (cf. Chapter 4.5).



Fig. 251: ISO CONTROL joystick

## 10.5 Super Low Speed Function

The Super Low Speed function is especially suited for the use in special crops where slow operation is required for lossless working. Super Low Speed enables automatic steering from 30m/h.

**NOTICE**

Super Low Speed requires an RTK receiver.

**NOTICE**

Super Low Speed is an additional function subject to a charge, the activation for which must be purchased separately. If required, please contact your retailer.



## 10.6 John Deere Split Screen

When using the John Deere GreenStar-Terminal, ULTRA GUIDANCE PSR ISO can also be displayed as split screen (half-size or quarter-size).

In split screen mode the following functions are available (see Fig. 252 and Fig. 253):

- activation of steering,
- nudging left/right,
- recenter,
- display of the current nudging value.



Fig. 252: John Deere Layout Manager

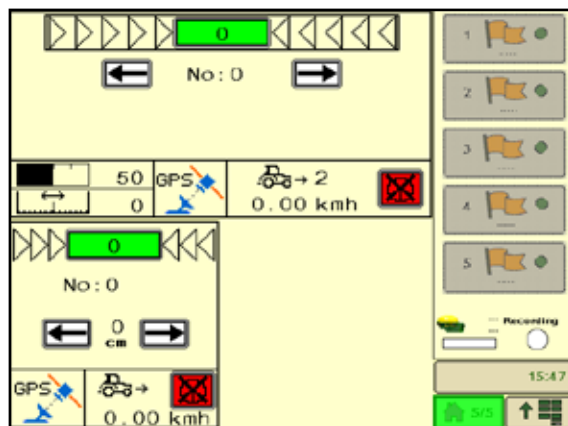


Fig. 253: John Deere Split Screen with Reichhardt mask



## **11 Servicing**

For a consistent high quality of the results and an extension of the system lifetime, it is necessary to check the relevant points on a regular basis.

### **Check Hydraulics**

Have the hydraulic hoses checked for leaks, bends, cuts, breaks, abrasion points, blistering, corrosion, exposed tissues and other signs of wear or damage on a regular basis – at least once a year – by your retailer.

### **Check Fixtures**

Check all fixtures on the components of your steering system on a regular basis.



## 12 Working and Storage Conditions

The electronic components of the PSR steering system are intended for the use under harsh environmental conditions in agricultural and similar applications.

**NOTICE**

Do under no circumstances use a high-pressure cleaner for cleaning the components. Use a damp cloth.

In order to increase their lifetime, you should provide for all parts of the system being stowed and stored together with all screws and required accessories during winter or when the components are not mounted to a vehicle. Avoid humidity and moisture as well as places with high temperatures near ventilation systems, radiators, engines and devices generating heat.

Avoid storage near windows or roof lights which generate heat due to solar radiation.



## 13 Error List

Error-No.	Description	Cause	Troubleshooting
100	no receiver is correctly connected to the PSR	<ul style="list-style-type: none"> <li>- open wire between GPS-receiver and PSR iBox</li> <li>- fuse B6.1 or B6.2 defective</li> <li>- no power at receiver</li> </ul>	<ul style="list-style-type: none"> <li>- check cables from PSR iBox to GPS-receiver</li> <li>- check fuses in PSR iBox</li> <li>- check the signals from the GPS receiver to be evaluated (NMEA 0183, NMEA 2000, J1939 GPS)</li> </ul>
101	no reception of GPS signals	<ul style="list-style-type: none"> <li>- wrong wires are connected</li> <li>- wrong baudrate</li> </ul>	<ul style="list-style-type: none"> <li>- check cable between GPS-receiver and PSR iBox</li> <li>- check settings of GPS-receiver</li> </ul>
102	poor reception of GPS signals	<ul style="list-style-type: none"> <li>- no free view to the sky</li> <li>- objects (trees, houses etc.) disturb the reception</li> </ul>	move to an open area
103	no A-B line saved	there is no A-B line saved for this job	<ul style="list-style-type: none"> <li>- save a new A-B line under current job number</li> <li>- select another job number, where an A-B line is saved</li> </ul>
104	saved A-B line is too far away	vehicle/receiver is too far away from the original A-B line	<ul style="list-style-type: none"> <li>- save A-B line again</li> <li>- drive to the original A-B line or re-center</li> </ul>
105	position is out of range	system can be used for +/- 10000 passes	<ul style="list-style-type: none"> <li>- save a new A-B line under current job number</li> <li>- drive into range of +/- 10000 passes</li> </ul>
106	already receiving GPS signals, but these need to be examined	GPS receiver has not yet properly started	<ul style="list-style-type: none"> <li>- Wait until the GPS receiver starts properly</li> <li>- move to an open area</li> </ul>
111	message RMC is not received	wrong settings of the GPS-receiver	check the GPS-receiver settings
112	message GGA is not received	wrong settings of the GPS-receiver	check the GPS-receiver settings
113	message VTG is not received	wrong settings of the GPS-receiver	check the GPS-receiver settings
114	message J1939 VP is not received	wrong settings of the GPS-receiver	check the GPS-receiver settings
115	message J1939 VDS is not received	wrong settings of the GPS-receiver	check the GPS-receiver settings
116	message NMEA 2000 RDU is not received	wrong settings of the GPS-receiver	check the GPS-receiver settings
117	message NMEA 2000 CSD is not received	wrong settings of the GPS-receiver	check the GPS-receiver settings
118	message NMEA 2000 PD is not received	wrong settings of the GPS-receiver	check the GPS-receiver settings
119	GPS receiver lost RTK quality	GPS receiver switched to lower gps quality than RTK	check reference age
120	GPS receiver lost DGPS quality	GPS receiver switched to lower gps quality as DGPS	check reference age
121	GPS update rate is too slow	wrong settings of the GPS-receiver	check the GPS-receiver settings

Error-No.	Description	Cause	Troubleshooting
1000	no signal from angle sensor	<ul style="list-style-type: none"> <li>- short circuit in cable</li> <li>- open wire in cable</li> <li>- sensor is defective</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect angle sensor</li> <li>- check cables from PSR iBox to wheel angle sensor</li> <li>- if all connections are good, replace wheel angle sensor</li> <li>- check contacts of connectors</li> </ul>
1001	angle sensor does not work correctly	<ul style="list-style-type: none"> <li>- axis is driven to block</li> <li>- mechanism or suspension of wheel angle sensor defective</li> <li>- a new wheel angle sensor was assembled incorrectly</li> <li>- an obstacle prevents the movement of the axis</li> </ul>	<ul style="list-style-type: none"> <li>- check mechanism of wheel angle sensor</li> <li>- for new angle sensors, the sensor has to be calibrated through the „teach-in“ page</li> </ul>
1010	no signal from 2nd angle sensor	<ul style="list-style-type: none"> <li>- short circuit in cable</li> <li>- open wire in cable</li> <li>- sensor is defective</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect 2nd angle sensor</li> <li>- check cables from PSR iBox to wheel angle sensor</li> <li>- if all connections are good, replace wheel angle sensor</li> <li>- check contacts of connectors</li> </ul>
1019	recenter left and right angle sensor	<ul style="list-style-type: none"> <li>- wheels run too far apart (out of phase)</li> <li>- open wire in cable</li> <li>- sensor is defective</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- turn wheels from full left to full right</li> <li>- check cables from PSR iBox to wheel angle sensor</li> <li>- if all connections are good, exchange wheel angle sensor</li> <li>- check contacts of connectors</li> </ul>
1020	cabin door is open	<ul style="list-style-type: none"> <li>- cabin door is open</li> <li>- open wire in cable</li> <li>- door switch is defective</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- close cabin door</li> <li>- check cables from PSR iBox to door switches</li> <li>- check door switches</li> <li>- check contacts of connectors</li> </ul>
1040	pressure sensor open wire	<ul style="list-style-type: none"> <li>- pressure sensor is defective</li> <li>- open wire in cable</li> <li>- bolted connection of pressure sensor is not correct</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- pressure sensor is defective</li> <li>- open wire in cable</li> <li>- bolted connection of pressure sensor is not correct</li> <li>- contacts of connectors are opened</li> </ul>
1041	pressure sensor short circuit	<ul style="list-style-type: none"> <li>- pressure sensor is defective</li> <li>- short circuit in cable</li> <li>- bolted connection of pressure sensor is not correct</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect pressure sensor</li> <li>- check cables from PSR iBox to pressure sensor</li> <li>- check bolted connection of pressure sensor</li> <li>- check contacts of connectors</li> </ul>
1042	Steering wheel was not turned	since last disengaging steering wheel was not turned	turn steering wheel, release and re-engage
1080	gyroscope open wire	<ul style="list-style-type: none"> <li>- gyroscope is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect gyroscope</li> <li>- check cables from PSR iBox to gyroscope</li> <li>- check contacts of connectors</li> </ul>



Error-No.	Description	Cause	Troubleshooting
1081	gyroscope short circuit	<ul style="list-style-type: none"> <li>- gyroscope is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect gyroscope</li> <li>- check cables from PSR iBox to gyroscope</li> <li>- check contacts of connectors</li> </ul>
1082	gyroscope no reaction	gyroscope is defective	<ul style="list-style-type: none"> <li>- inspect gyroscope</li> <li>- check cables from PSR iBox to gyroscope</li> <li>- check contacts of connectors</li> <li>- check input value from gyroscope in the diagnosis menu</li> </ul>
1084	gyroscope out of range	too sharp a turn with too high of speed	<ul style="list-style-type: none"> <li>- see 1082</li> <li>- reduce speed</li> <li>- make wider turn</li> </ul>
1085	gyroscope average value is out of range	<ul style="list-style-type: none"> <li>- speed signal is defective</li> <li>- gyroscope is defective</li> </ul>	see 1082
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
1087	last error message from Gilt sensor was not received	<ul style="list-style-type: none"> <li>- sensor is defective</li> <li>- SPI communication problem</li> </ul>	contact Reichhardt support
1088	Gilt sensor EEPROM data invalid	<ul style="list-style-type: none"> <li>- sensor is defective</li> <li>- SPI communication problem</li> </ul>	<ul style="list-style-type: none"> <li>- contact Reichhardt support</li> <li>- restart PSR</li> </ul>
1089	Gilt sensor temperature compensation not active	<ul style="list-style-type: none"> <li>- sensor is defective</li> <li>- SPI communication problem</li> </ul>	<ul style="list-style-type: none"> <li>- contact Reichhardt support</li> <li>- restart PSR</li> </ul>
1094	Gilt sensor invalid parameter	<ul style="list-style-type: none"> <li>- sensor is defective</li> <li>- sensor is not properly initialized</li> </ul>	contact Reichhardt support
1095	Gilt sensor invalid state	<ul style="list-style-type: none"> <li>- sensor is defective</li> <li>- SPI communication problem</li> </ul>	<ul style="list-style-type: none"> <li>- contact Reichhardt support</li> <li>- restart PSR</li> </ul>
1096	Gilt sensor invalid offset	<ul style="list-style-type: none"> <li>- sensor is defective</li> <li>- sensor is not properly initialized</li> </ul>	<ul style="list-style-type: none"> <li>- contact Reichhardt support</li> <li>- restart PSR</li> </ul>
1097	Gilt sensor ID failed	<ul style="list-style-type: none"> <li>- sensor is defective</li> <li>- sensor is not properly initialized</li> </ul>	<ul style="list-style-type: none"> <li>- contact Reichhardt support</li> <li>- restart PSR</li> </ul>
1098	Gilt sensor damaged	sensor is defective	contact Reichhardt support
1099	Gilt sensor no AD values	<ul style="list-style-type: none"> <li>- sensor is defective</li> <li>- SPI communication problem</li> </ul>	contact Reichhardt support
1100	TAC sensor left open wire	<ul style="list-style-type: none"> <li>- TAC sensor is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect TAC sensor</li> <li>- check cables from PSR iBox to TAC sensor</li> <li>- check contacts of connectors</li> </ul>
1101	TAC sensor left short circuit	<ul style="list-style-type: none"> <li>- TAC sensor is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect TAC sensor</li> <li>- check cables from PSR iBox to TAC sensor</li> <li>- check contacts of connectors</li> </ul>

Error-No.	Description	Cause	Troubleshooting
1102	TAC sensor right open wire	<ul style="list-style-type: none"> <li>- TAC sensor is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect TAC sensor</li> <li>- check cables from PSR iBox to TAC sensor</li> <li>- check contacts of connectors</li> </ul>
1103	TAC sensor right short ircuit	<ul style="list-style-type: none"> <li>- TAC sensor is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect TAC sensor</li> <li>- check cables from PSR iBox to TAC sensor</li> <li>- check contacts of connectors</li> </ul>
1104	2. TAC sensor left open wire	<ul style="list-style-type: none"> <li>- TAC sensor is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect TAC sensor</li> <li>- check cables from PSR iBox to TAC sensor</li> <li>- check contacts of connectors</li> </ul>
1105	2. TAC sensor left short ircuit	<ul style="list-style-type: none"> <li>- TAC sensor is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect TAC sensor</li> <li>- check cables from PSR iBox to TAC sensor</li> <li>- check contacts of connectors</li> </ul>
1106	2. TAC sensor right open wire	<ul style="list-style-type: none"> <li>- TAC sensor is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect TAC sensor</li> <li>- check cables from PSR iBox to TAC sensor</li> <li>- check contacts of connectors</li> </ul>
1107	2. TAC sensor right short ircuit	<ul style="list-style-type: none"> <li>- TAC sensor is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect TAC sensor</li> <li>- check cables from PSR iBox to TAC sensor</li> <li>- check contacts of connectors</li> </ul>
1115	joystick open wire	<ul style="list-style-type: none"> <li>- joystick is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect joystick</li> <li>- check cables from PSR iBox to joystick</li> <li>- check contacts of connectors</li> </ul>
1116	joystick short ircuit	<ul style="list-style-type: none"> <li>- joystick is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect joystick</li> <li>- check cables from PSR iBox to row-feeler</li> <li>- check contacts of connectors</li> </ul>
1117	joystick configuration invalid	second angle sensor is used	<ul style="list-style-type: none"> <li>- use only one angle sensor</li> <li>- disable joystick</li> </ul>
1150	rowfinder open wire	<ul style="list-style-type: none"> <li>- rowfeeler is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect rowfinder</li> <li>- check cables from PSR iBox to rowfinder</li> <li>- check contacts of connectors</li> </ul>
1151	rowfinder short ircuit	<ul style="list-style-type: none"> <li>- rowfeeler is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect rowfinder</li> <li>- check cables from PSR iBox to rowfinder</li> <li>- check contacts of connectors</li> </ul>
1200	camera no reaction	<ul style="list-style-type: none"> <li>- camera is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect camera</li> <li>- check cables from PSR iBox to camera</li> <li>- check contacts of connectors</li> </ul>

Error-No.	Description	Cause	Troubleshooting
1210	no signal from camera while operating	<ul style="list-style-type: none"> <li>- camera is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect camera</li> <li>- check cables from PSR iBox to camera</li> <li>- check contacts of connectors</li> </ul>
1220	no signal from camera while operating	<ul style="list-style-type: none"> <li>- adjustment of camera is incorrect</li> <li>- distance between camera and plants is too small</li> <li>- there's excess vegetation between plants</li> </ul>	<ul style="list-style-type: none"> <li>- check mounting of the camera</li> <li>- check parameter/adjustments of the camera</li> <li>- clean camera lens</li> <li>- use additional lighting when ambient lighting is poor</li> </ul>
1350	speed is too fast	vehicle speed is too fast	reduce speed and activate system again
1351	no speed information from "ISO GBSD"	tractor ECU doesn't support this speed message	change setting of speed signal source
1352	no speed information from „ISO WBSD“	tractor ECU doesn't support this speed message	change setting of speed signal source
1353	invalid speed information	<ul style="list-style-type: none"> <li>- source of speed information is invalid</li> <li>- no messages received from source of speed</li> </ul>	change setting of speed signal source
1354	constant speed is active	<ul style="list-style-type: none"> <li>- for testing, constant speed is activated</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>⚠ WARNING</b> Risk of injury!  Once PSR is engaged, the axle is driven and the wheels can move. Ensure that no persons are in the danger zone and drive with the utmost care. </div>	<ul style="list-style-type: none"> <li>- change setting</li> <li>- contact Reichhardt support</li> </ul>
1355	speed too high for engaging	current speed is too high	reduce speed for engagement
1356	no speed information from "NMEA_2000"	no NMEA_2000 speed information available	change setting of speed signal source
1357	speed is out of range	<ul style="list-style-type: none"> <li>- speed is too slow</li> <li>- speed is too fast</li> </ul>	<ul style="list-style-type: none"> <li>- speed up</li> <li>- reduce speed</li> </ul>
1400	ultra sonic 1 open wire	<ul style="list-style-type: none"> <li>- ultra sonic 1 is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect ultra sonic 1</li> <li>- check cables from PSR iBox to ultra sonic 1</li> <li>- check contacts of connectors</li> </ul>
1401	ultra sonic 2 open wire	<ul style="list-style-type: none"> <li>- ultra sonic 2 is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect ultra sonic 2</li> <li>- check cables from PSR iBox to ultra sonic 2</li> <li>- check contacts of connectors</li> </ul>
1402	ultra sonic 3 open wire	<ul style="list-style-type: none"> <li>- ultra sonic 3 is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect ultra sonic 3</li> <li>- check cables from PSR iBox to ultra sonic 3</li> <li>- check contacts of connectors</li> </ul>

Error-No.	Description	Cause	Troubleshooting
1403	ultra sonic 4 open wire	<ul style="list-style-type: none"> <li>- ultra sonic 4 is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect ultra sonic 4</li> <li>- check cables from PSR iBox to ultra sonic 4</li> <li>- check contacts of connectors</li> </ul>
1404	all ultra sonic open wire	<ul style="list-style-type: none"> <li>- connector is disconnected from the front plug box</li> <li>- open wire at ground or start signal</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect all ultra sonics</li> <li>- check cables from PSR iBox to all ultra sonic</li> <li>- check contacts of connectors</li> </ul>
1410	ultra sonic 1 no signal	detectable objects are out of range	<ul style="list-style-type: none"> <li>- inspect ultra sonic 1</li> <li>- check adjustment of ultra sonic 1</li> </ul>
1411	ultra sonic 2 no signal	detectable objects are out of range	<ul style="list-style-type: none"> <li>- inspect ultra sonic 2</li> <li>- check adjustment of ultra sonic 2</li> </ul>
1412	ultra sonic 3 no signal	detectable objects are out of range	<ul style="list-style-type: none"> <li>- inspect ultra sonic 3</li> <li>- check adjustment of ultra sonic 3</li> </ul>
1413	ultra sonic 4 no signal	detectable objects are out of range	<ul style="list-style-type: none"> <li>- inspect ultra sonic 4</li> <li>- check adjustment of ultra sonic 4</li> </ul>
1414	all ultra sonic no signal	all detectable objects are out of range	check adjustment of all ultra sonic
1500	lock valve left open wire	<ul style="list-style-type: none"> <li>- lock valve is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect lock valve</li> <li>- check cables from PSR iBox to lock valve</li> <li>- check contacts of connectors</li> </ul>
1501	lock valve left short circuit	<ul style="list-style-type: none"> <li>- lock valve is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect lock valve</li> <li>- check cables from PSR iBox to lock valve</li> <li>- check contacts of connectors</li> </ul>
1502	lock valve right open wire	<ul style="list-style-type: none"> <li>- lock valve is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect lock valve</li> <li>- check cables from PSR iBox to lock valve</li> <li>- check contacts of connectors</li> </ul>
1503	lock valve right short circuit	<ul style="list-style-type: none"> <li>- lock valve is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect lock valve</li> <li>- check cables from PSR iBox to lock valve</li> <li>- check contacts of connectors</li> </ul>
1550	steer valve left open wire	<ul style="list-style-type: none"> <li>- steer valve is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect steer valve</li> <li>- check cables from PSR iBox to steer valve</li> <li>- check contacts of connectors</li> </ul>
1551	steer valve left short circuit	<ul style="list-style-type: none"> <li>- steer valve is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	<ul style="list-style-type: none"> <li>- inspect steer valve</li> <li>- check cables from PSR iBox to steer valve</li> <li>- check contacts of connectors</li> </ul>

Error-No.	Description	Cause	Troubleshooting
1552	steer valve right open wire	<ul style="list-style-type: none"> <li>- steer valve is defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	<ul style="list-style-type: none"> <li>- inspect steer valve</li> <li>- check cables from PSR iBox to steer valve</li> <li>- check contacts of connectors</li> </ul>
1553	steer valve right short circuit	<ul style="list-style-type: none"> <li>- steer valve is defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed.</li> </ul>	<ul style="list-style-type: none"> <li>- inspect steer valve</li> <li>- check cables from PSR iBox to steer valve</li> <li>- check contacts of connectors</li> </ul>
1700	front plug no voltage	<ul style="list-style-type: none"> <li>- outlet at the PSR iBox is defective</li> <li>- short circuit in cable</li> </ul>	check cables from PSR iBox to front plug
1701	start signal ultra sonic no voltage	<ul style="list-style-type: none"> <li>- outlet at the PSR iBox is defective</li> <li>- short circuit in cable</li> </ul>	check cables from PSR iBox to front plug
1702	GPS no voltage	<ul style="list-style-type: none"> <li>- outlet at the PSR iBox is defective</li> <li>- short circuit in cable</li> </ul>	check cables from PSR iBox to GPS-receiver
1703	sensors no voltage	<ul style="list-style-type: none"> <li>- outlet at the PSR iBox is defective</li> <li>- short circuit in cable</li> </ul>	check cables from PSR iBox to all sensors
1710	no power at relay input side	<ul style="list-style-type: none"> <li>- fuse defective</li> <li>- power supply is not switched on</li> </ul>	<ul style="list-style-type: none"> <li>- check fuses in iBox and at power input</li> <li>- check power is switch on</li> </ul>
1711	no power at relay output side	relay in iBox is defective	contact 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)
2110	RDU/RDU2/RDU3 – voltage too high	supply voltage is too high	change the supply voltage of the iBox to max 15V.
2150	john deere autotrac	no communication	check cables from PSR iBox to JD Autotrac Motor
2155	AG junction motor	no communication	check cables between PSR an AG junction motor
2156	Novariant motor	no communication	check cables between PSR an Novariant motor
2200	footswitch error	<ul style="list-style-type: none"> <li>- footswitch defective</li> <li>- short circuit in cable</li> <li>- footswitch engaged too long or stuck</li> </ul>	<ul style="list-style-type: none"> <li>- check footswitch</li> <li>- check cables from PSR iBox to footswitch</li> </ul>
2300	Challenger MT 700/800 hydraulic lockout switch engaged	the hydraulics are locked out by switch.	check hydraulic lockout switch
2301	Challenger MT 700/800 communication error	<ul style="list-style-type: none"> <li>- poor CAN connection</li> <li>- activate ISO implementation level 3 on the Challenger screen (A-B series)</li> </ul>	<ul style="list-style-type: none"> <li>- check cables from PSR iBox to Challenger ISOBUS.</li> <li>- verify correct vehicle code entered</li> <li>- activate ISO implementation level 3 on the Challenger screen (A-B series)</li> </ul>
2310	ISO Fendt communication error CAN bus 1	PSR doesn't receive information from CAN bus	contact Reichhardt support

Error-No.	Description	Cause	Troubleshooting
2311	ISO Fendt communication error CAN bus 2	PSR doesn't receive information from CAN bus	contact Reichhardt support
2312	CASE Combine communication error	No connection to CASE Combine	contact Reichhardt support
2313	CASE Combine System lock	System is locked by armrest switch	Unlock system by pressing and holding armrest switch
2314	CASE Combine no message from PSR	CASE controller does not receive messages from PSR	contact Reichhardt support
2315	ISO AGCO Combine communication error CAN bus 1	PSR doesn't receive information from CAN bus	contact Reichhardt support
2316	ISO AGCO Combine communication error CAN bus 2	PSR doesn't receive information from CAN bus	contact Reichhardt support
2317	ISO AgriFac communication error	PSR doesn't receive GMS messages	contact Reichhardt support
2318	ISO AgriFac communication error	PSR doesn't receive vehicle / joystick messages	contact Reichhardt support
2319	ISO Steering-Controller communication error	PSR doesn't receive messages from the steering controller	contact Reichhardt support
2320	ISO Challenger Tractor MT 675 C – communication error CAN bus 1	the steering is disengaged by switch	check switch
2321	ISO Challenger Tractor MT 675 C – communication error CAN bus 2	PSR doesn't receive information from CAN bus	contact Reichhardt support
2322	ISO AGCO Windrower communication error CAN bus 2	PSR doesn't receive information from CAN bus	contact Reichhardt support
2323	ISO AGCO Windrower communication error from PSR	Windrower has not detected PSR.	contact Reichhardt support
2324	ISO AGCO Windrower not ready to use	Windrower is not moving forward	drive forward in gear 1 or 2
2325	ISO Challenger Tractor 900 C communication error	PSR doesn't receive any information from Challenger 900 C	contact Reichhardt support
2330	CLAAS XERION communication error	PSR doesn't receive any information from XERION	check cables from PSR iBox to vehicle 2. CAN bus
2335	CLAAS LEXION communication error	PSR doesn't receive any information from LEXION	check cables from PSR iBox to vehicle 2. CAN bus
2340	Krone Big X / Big M communication error	PSR doesn't receive any information from Krone	contact Reichhardt support
2341	Amazone Sprayer Pantera	No communication	contact Reichhardt support
2342	Kubota Tractor	No communication	contact Reichhardt support
2343	Miller Nitro Auto-Steer-Ready	No communication	contact Reichhardt support
2345	Rostselmash Torum Combine communication error CAN bus 1	PSR doesn't receive information from CAN bus	contact Reichhardt support
2346	Rostselmash Torum Combine communication error CAN bus 2	PSR doesn't receive information from CAN bus	contact Reichhardt support
2347	Valtra Tractor communication error CAN bus 1	PSR doesn't receive information from CAN bus	contact Reichhardt support
2348	Valtra Tractor communication error CAN bus 2	PSR doesn't receive information from CAN bus	contact Reichhardt support

Error-No.	Description	Cause	Troubleshooting
2349	Rostselmash Torum Current gear is not correct	Current gear is not correct	shift gears
2350	2. CAN bus communication error	poor CAN connection	check cables from PSR iBox to vehicle 2. CAN bus
2351	TerraGator 1. CAN-BUS communication error	poor CAN connection	check cables from PSR iBox to vehicle 1. CAN bus
2352	TerraGator 2. CAN bus communication error	poor CAN connection	check cables from PSR iBox to vehicle 2. CAN bus
2353	TerraGator no valid rear axle position	no information about rear axle position	contact Reichhardt support
2360	TL Top not ready to use	<ul style="list-style-type: none"> <li>- application has not been started</li> <li>- it has not yet created a GPS job</li> </ul>	<ul style="list-style-type: none"> <li>- start application</li> <li>- setup a new gps job</li> <li>- disable TL Top communication in teach menu</li> </ul>
2361	auxiliary valve communication error	<ul style="list-style-type: none"> <li>- no TECU available</li> <li>- connected TECU does not support auxiliary valve function</li> </ul>	<ul style="list-style-type: none"> <li>- check ISO bus for TECU member</li> <li>- check ISO bus if there are more than one TECU active</li> </ul>
2400	tilt sensor open wire	<ul style="list-style-type: none"> <li>- tilt sensor defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	check cables from PSR iBox to tilt sensor
2401	tilt sensor short circuit	<ul style="list-style-type: none"> <li>- tilt sensor defective</li> <li>- short circuit in cable</li> <li>- contacts of connectors are closed</li> </ul>	check cables from PSR iBox to tilt sensor
2402	tilt sensor not connected	<ul style="list-style-type: none"> <li>- tilt sensor defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened</li> </ul>	check cables from PSR iBox to tilt sensor
2403	tilt sensor no reaction	<ul style="list-style-type: none"> <li>- tilt sensor defective</li> <li>- open wire in cable</li> <li>- contacts of connectors are opened.</li> </ul>	check cables from PSR iBox to tilt sensor
2410	engagement denied by krone machine	operator tried to engage by footswitch or terminal	operator has to engage by joystick
3001	vehicle code for vehicle 1 is invalid	wrong vehicle code is set up, or no vehicle code entered	dial in a valid vehicle code for vehicle 1
3002	vehicle code for vehicle 2 is invalid	wrong vehicle code is set up, or no vehicle code entered	dial in a valid vehicle code for vehicle 2
3003	vehicle code for vehicle 3 is invalid	wrong vehicle code is set up, or no vehicle code entered	dial in a valid vehicle code for vehicle 3
3004	vehicle code for vehicle 4 is invalid	wrong vehicle code is set up, or no vehicle code entered	dial in a valid vehicle code for vehicle 4
3005	vehicle code for vehicle 5 is invalid	wrong vehicle code is set up, or no vehicle code entered	dial in a valid vehicle code for vehicle 5
3006	vehicle code for vehicle 6 is invalid	wrong vehicle code is set up, or no vehicle code entered	dial in a valid vehicle code for vehicle 6
3007	vehicle code for vehicle 7 is invalid	wrong vehicle code is set up, or no vehicle code entered	dial in a valid vehicle code for vehicle 7
3008	vehicle code for vehicle 8 is invalid	wrong vehicle code is set up, or no vehicle code entered	dial in a valid vehicle code for vehicle 8

Error-No.	Description	Cause	Troubleshooting
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 receiver height is not calibrated	GPS receiver height is not calibrated	teach mounted height of GPS-receiver
3018	GPS receiver offset left - right is not calibrated	GPS receiver offset left -right is not calibrated	teach left and right offset of GPS-receiver center position
3019	GPS receiver look ahead is not calibrated	GPS receiver look ahead is not calibrated	teach look ahead of GPS-receiver
3020	joystick is not calibrated	joystick is not calibrated	teach analog signal center position for joystick
3030	travel direction is not set correctly	Teach value of "axle type" and "travel direction type" doesn't match. When travel direction is "sensor + gps" then axle type has to be "wheel angle sensor".	<ul style="list-style-type: none"> <li>- change axle sensor type</li> <li>- change travel direction type</li> </ul>
4000	no communication to Terra Variant	no CAN information received from Terra Variant	<ul style="list-style-type: none"> <li>- check cables from PSR iBox to Terra Variant</li> <li>- check vehicle code</li> </ul>
4010	No communication to Kubota M7 VCU1	no CAN information received from M7 VCU1	check cables from PSR iBox-MC to Kubota Tractor
4011	No communication to Kubota M7 VCU2	no CAN information received from M7 VCU2	check cables from PSR iBox-MC to Kubota Tractor
4012	Invalid resume switch state with Kubota M7	invalid resume switch state	<ul style="list-style-type: none"> <li>- check cables from PSR iBox-MC to M7 VCU2.</li> <li>- check resume switch</li> </ul>
4013	Invalid resume switch state with Kubota M7	invalid resume switch state	<ul style="list-style-type: none"> <li>- check cables from PSR iBox-MC to M7 VCU2.</li> <li>- check resume switch</li> </ul>
4020	Braud field / road switch	status road is active	engage field status
4021	no communication to Braud	no sensor readings	contact Reichhardt support
4022	no communication to Braud	no speed readings	contact Reichhardt support
4023	no communication to Braud	no safety switch readings	contact Reichhardt support
4024	no communication to Braud	no switch field/road switch readings	contact Reichhardt support
9000	invalid hardware	the hardware used is not compatible for this software	contact Reichhardt support
9001	terminal Version is too old	software update from PSR iBox	update the terminal with the latest software version available
9002	no steering mode is selected	<ul style="list-style-type: none"> <li>- there is no steering mode selected</li> <li>- a time limited license has expired</li> </ul>	<ul style="list-style-type: none"> <li>- select a steering mode.</li> <li>- contact Reichhardt support</li> </ul>



Error-No.	Description	Cause	Troubleshooting
9020	no additional time licenses are possible	a time limited license was used 3 times	contact Reichhardt support
9021	a time limited license ends	a time limited license ends	contact Reichhardt support
9050	battery power lost before system shut down completely	- battery / switched power wiring not correct - software issues	- system has no battery power or proper switch - contact Reichhardt support
9060	field/road switch	- Not in field position - Switch is defective	check switch position
9100	EEPROM write error	- EEPROM is defective - EEPROM is busy	contact Reichhardt support
9101	EEPROM read error	- EEPROM is defective - EEPROM is busy	contact Reichhardt support
9102	check EEPROM data	older software is updated	check all parameters and settings
9103	EEPROM values changed automatically	after software update is it sometimes necessary to set parameters to default	check parameters
9104	EEPROM value(s) out of range	a parameter was out of range and set to default	contact Reichhardt support
9105	vehicle offsets not taught	after software update new vehicle offsets need to be taught	teach vehicle offsets
9200	Direction of travel is unknown	after startup, or in case of failure, the direction of travel is unknown	- drive vehicle until direction of travel is known - check setup, type of detection for direction of travel
9991	task 1 runtime error	task 1 requires too much time	contact Reichhardt support
9992	task 2 runtime error	task 2 requires too much time	contact Reichhardt support
9993	task 3 runtime error	task 3 requires too much time	contact Reichhardt support
9994	task 4 runtime error	task 4 requires too much time	contact Reichhardt support
9997	USER stack overflow	USER stack size is too small.	contact Reichhardt support
9998	internal calculation errors	function has some problems	Please note the "Error intern"-Number. This can be seen from the diagnostic menu. Send this number to the software department.
9999	error ISO Lib	within the ISO Lib an error has occurred.	Please note the "Error ISO"-Number. This can be seen from the diagnostic menu. Send this number to the software department.

