CRX + RS1 AUTOSTEERING

RAVEN EUROPE GENERIC

016-8000-036EN REV. A1

Calibration manual

(English) (Original)

RAVEN

PREFACE

This installation manual is intended for persons responsible for installing a CRx and RS1 kit. The manual contains important instructions that should be complied with when commissioning, operating and servicing the CRx and RS1.

This manual has been compiled with the utmost care. Raven Europe assumes no responsibility for any errors or omissions in this document.

Any comments or questions can be sent to service-eu@ravenind.com.

Raven Europe or any of its suppliers will accept no liability for physical or material damage caused whilst using the CRx and RS1.

The installed Raven system produces less than 70dB (A) noise.

This calibration guide uses a number of concepts for extra attention to a few things:

Hint!:
Provides recommendations on how certain activities can be performed much easier.

Please note!:
Indicates certain problems that the user should take note of.

Caution!:
Indicates that the machine can be damaged.

Warning!:
Indicates a risk of injury.

DISCLAIMER

WARNING!

- The safety instructions contained in the manuals of the tractor or implements must be complied with at all times.
- Always switch off the tractor before installing or repairing hydraulic and electrical components of the SBGuidance system.
- It is strictly prohibited to use the CRx system on public roads.
- It is strictly prohibited to leave a driving vehicle unattended when the CRx system is switched on. The driver is always responsible for the direction and course of the vehicle.
- To prevent injury or fire, replace defective fuses only with fuses of the same type and amperage.
- The SBGuidance the operating system is not able to detect and avoid obstacles. If there is an obstacle in your path, you will always need to take action for it to be avoided.
- Only allow authorized/qualified persons to operate the system. Authorized/qualified persons are defined as: persons who have read and understood the manual, have been given instructions by a product specialist, and who are both physically and mentally fit and able to operate the system.
- The system contains moving parts! Make sure the immediate environment is clear of people before operating the system.
- In case of system failure or breakdown switch of the tractor and disconnect the electrical power source to avoid further damage. Contact your dealer for further instructions on how to repair your system.
- Always wear personal protective equipment when operating/adjusting/repairing the system outside of the tractor cab.
- In order to prevent power surges from occurring, always start the machine first, before initiating the SBGuidance control system.

PAY ATTENTION!

- Only touch the touch-screen with your finger or by using a special touch-screen stylus/pen. Operating the touch-screen with sharp objects may cause permanent damage to the screen.
- Always consult your supplier as to which products are best suited first before cleaning the touch-screen with chemicals or alcohol.
- If the terminal is not used for a long period, better remove the terminal from the tractor and store in a heated environment. This will extend the life span of the electronic components.
- To prevent theft, it is better to not let the terminal and GPS-antenna unattended in the tractor on the field.

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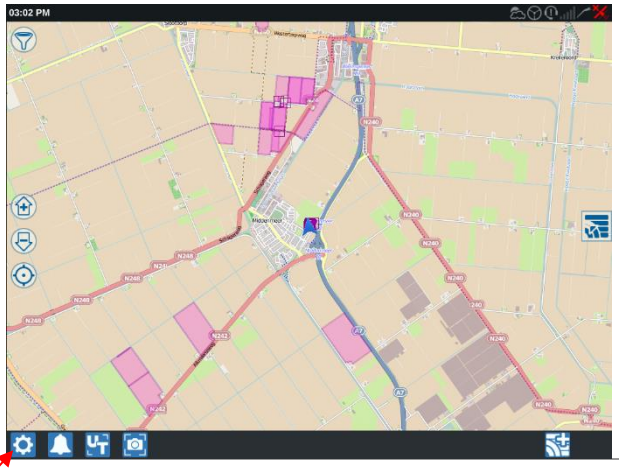
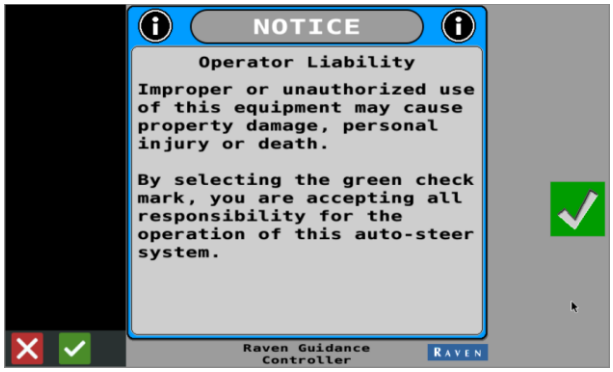
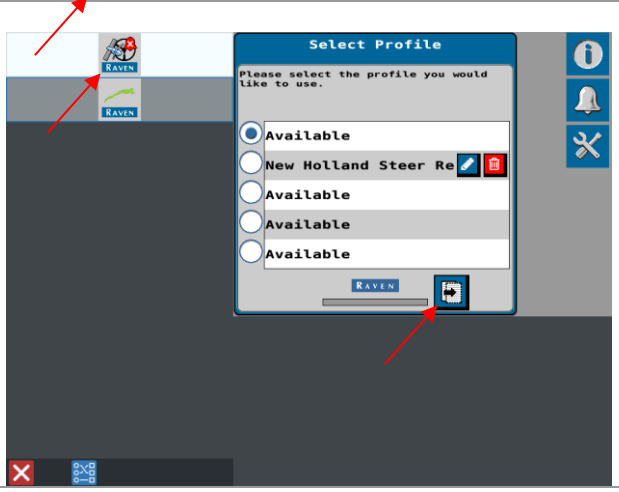
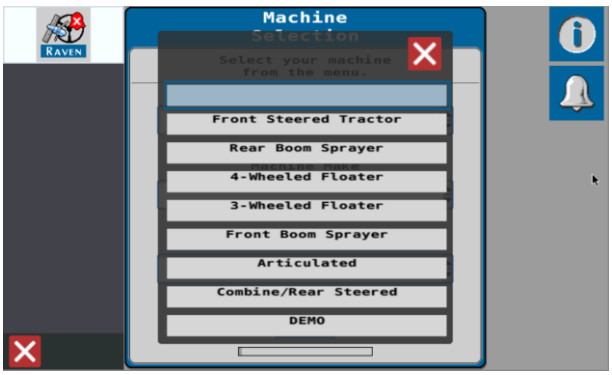
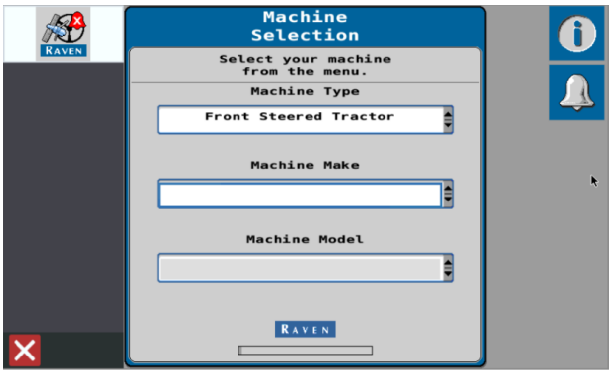
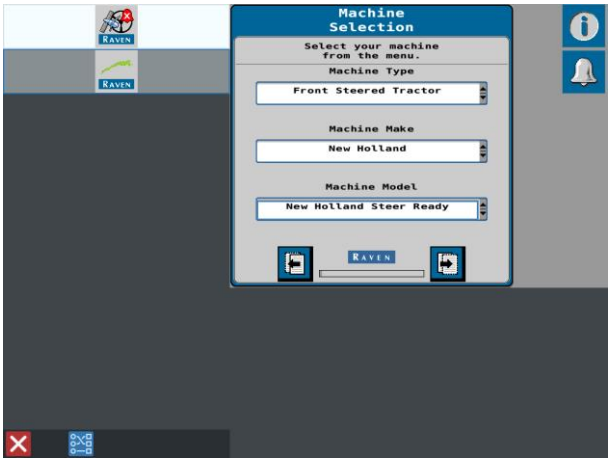
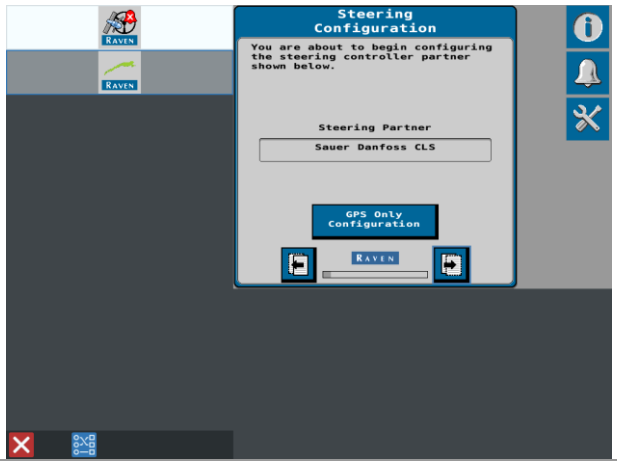
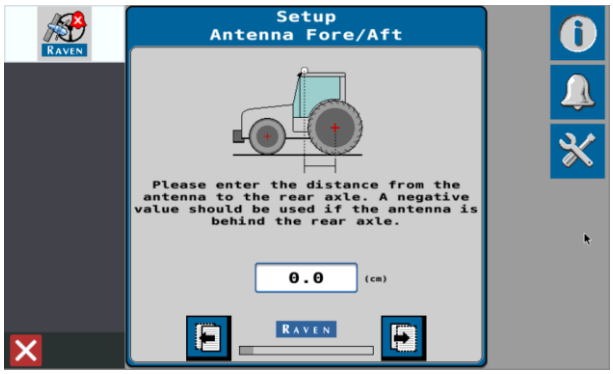
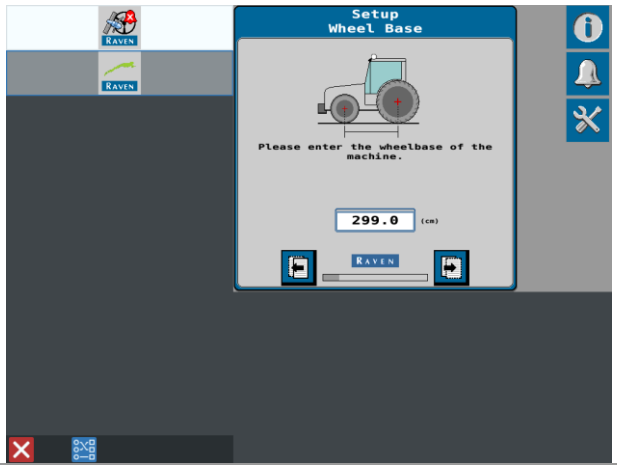
1 CALIBRATE RS1

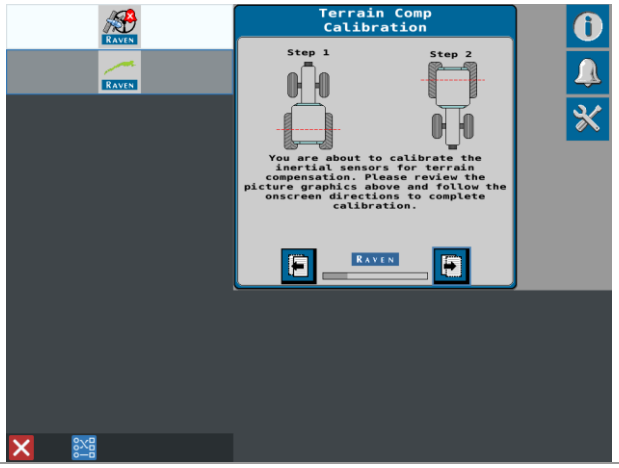
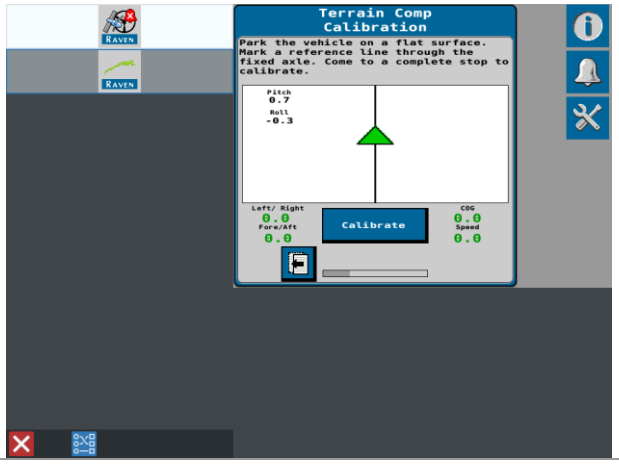
#	Description	Picture
01	Turn on the CRx system by pressing the power button	
02	Go to settings	
03	Read and Accept Operator Liability	

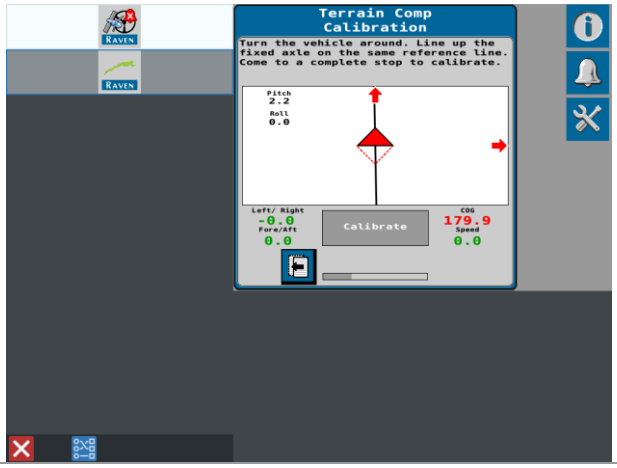
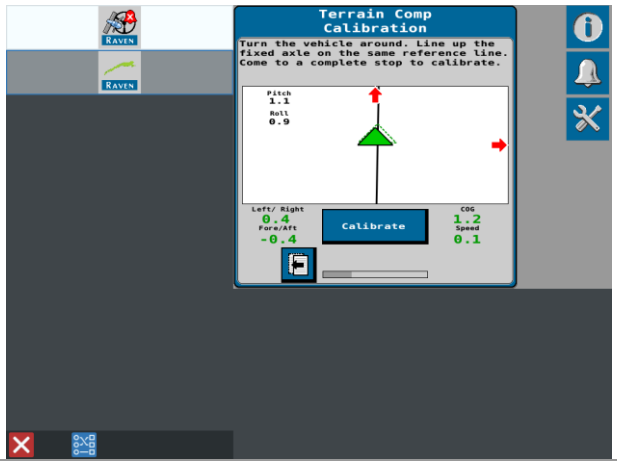
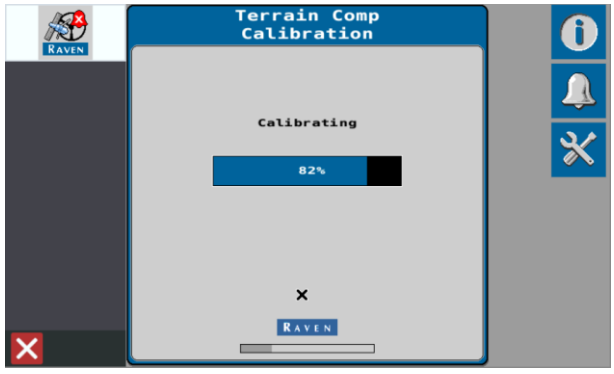
04	Go to the UT (Universal Terminal)	
05	Make sure the satellite UT is selected and select an Available profile and press next to proceed to Machine Selection. Select the '**Next**' arrow.	
06	If an standard tractor is being used select Front Steered tractor, otherwise select the correct Machine Type. Front steered tractor	
07	Select the Machine Make	

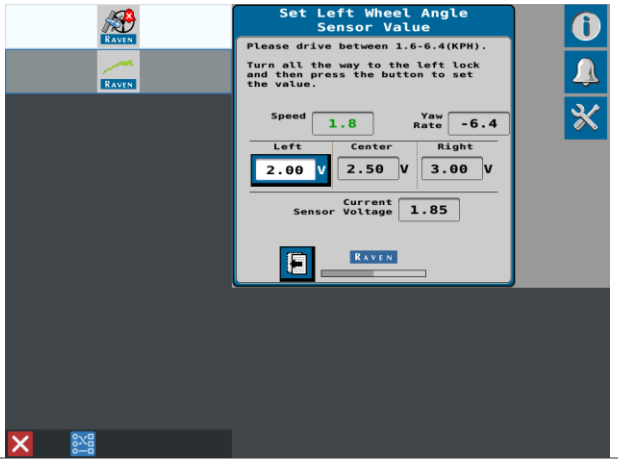
08	If **Generic** is chosen, the Machine Model can not be entered and is not needed as well. Select the correct Machine Make and Model. Select the **Next** arrow.	
09	The system is expecting a Steering Partner. For an ISO Steer Ready tractor, the specific brand will appear (see figure on the right). For a complete Raven Europe Steering system, the steering partner is called 'SBG HDU'. Select the '**Next**' arrow.	
10	Measure the distance from the rear axle to the center of antenna. Make sure the measurement is accurate. Select the '**Next**' arrow.	

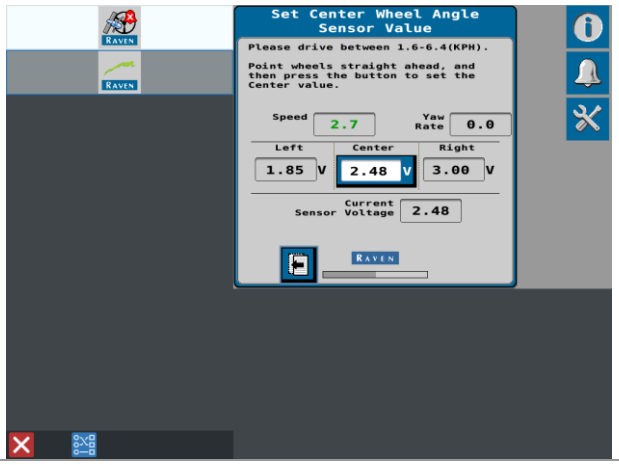
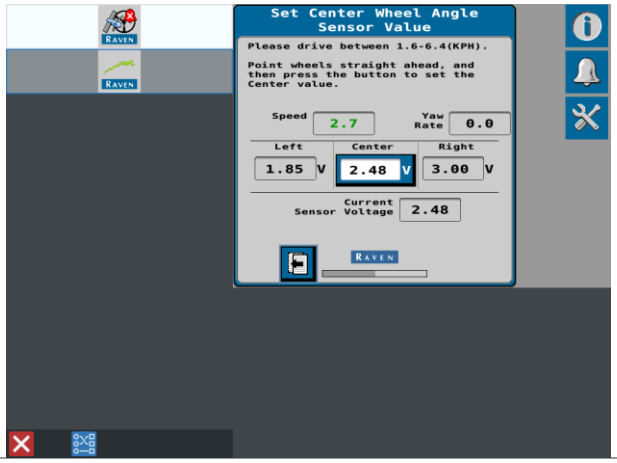
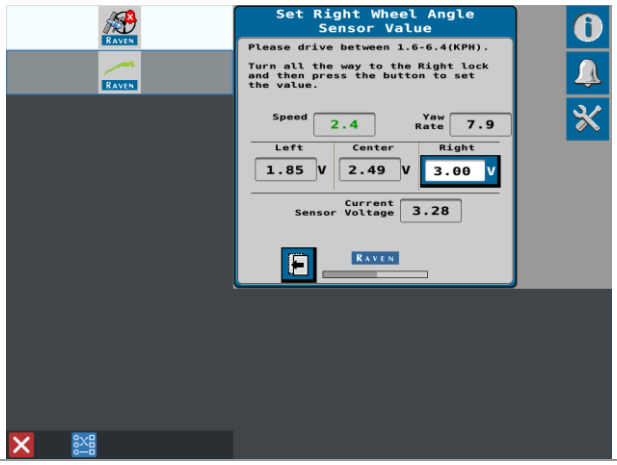
11	Measure and enter the distance from the rear axle to the antenna. Make sure the measurement is accurate. Select the '**Next**' arrow.	
12	If required, setup the Antenna Center Offset. This is the offset from the antenna to the Center of the machine. Make sure the measurement is accurate. Select the '**Next**' arrow.	
13	Measure and enter the value from the Antenna to the ground. Make sure the measurement is accurate. Select the '**Next**' arrow.	

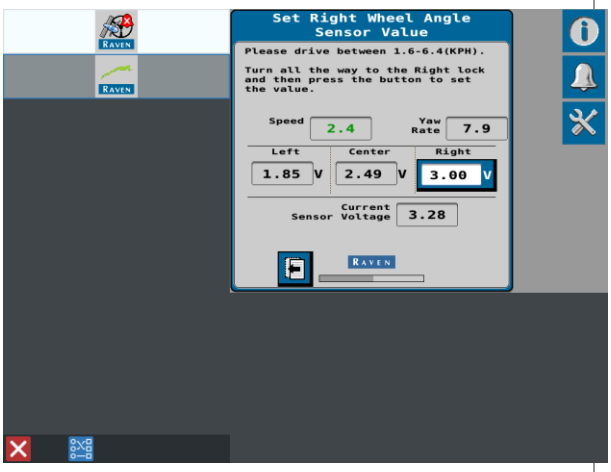
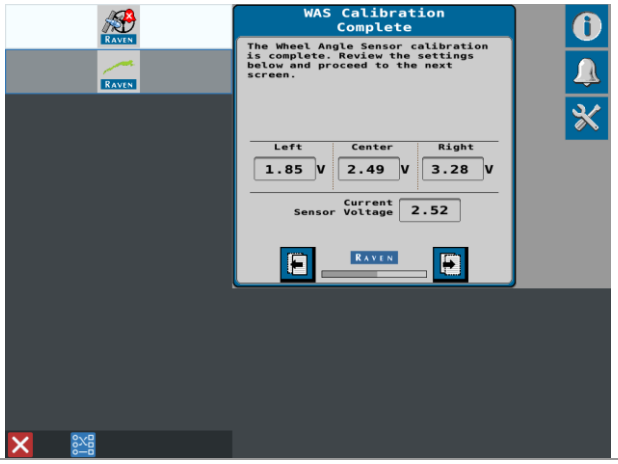
14	Measure and enter the value from the rear axle to the front axle. Make sure the measurement is accurate. Select the '**Next**' arrow.	
15	Setup the GPS Differential required for the system. In this example the RS1 is configured for RTK. Depending on the number of feature unlocks purchased, all options may not be available. It is possible to choose a RTK Format. When this one is on Auto, the receiver will select the correct format. Select the '**Next**' arrow.	
16	The GPS Status Information is shown. The satellite needs to be green or yellow. It can take a few minutes, depending on the view of the antenna and the selected accuracy (when there are buildings or trees around it can take longer than in the middle of a field) before the satellite turns green. Select the '**Next**' arrow.	

17	Drive forward. The calibration proceeds automatically to the next step. If it stays in this screen, press on the button next to Vehicle Direction. Now the calibration proceeds to the next step automatically. Select the '**Next**' arrow.	
18	Drive 10m forward. After the Distance traveled is up to 10m or more, the calibration continues automatically to the next step. Select the '**Next**' arrow.	
19	After 10m is traveled, the system continues to the Terrain Compensation Calibration. Select the '**Next**' arrow.	
20	Now drive to a flat surface, mark the place of the rear axle and make sure the whole machine (including the cab) is completely standing still and not moving or shaking. After the place of the rear axle is marked, press Calibrate.	

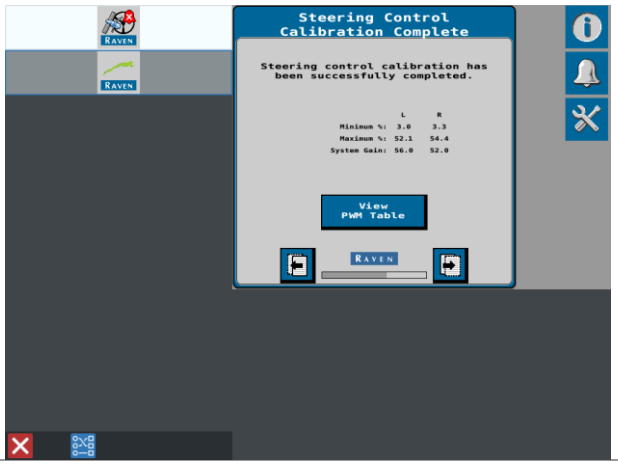
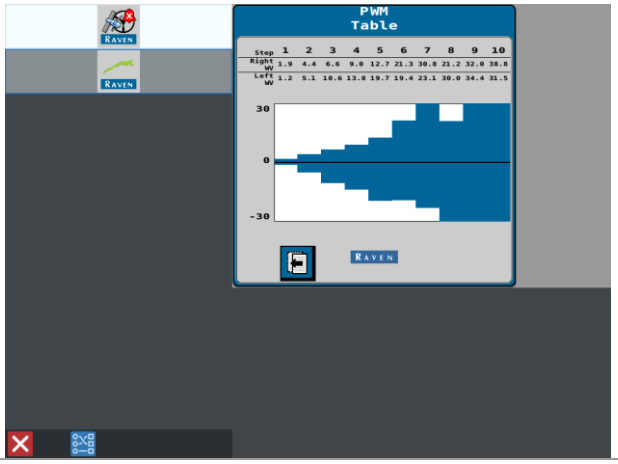
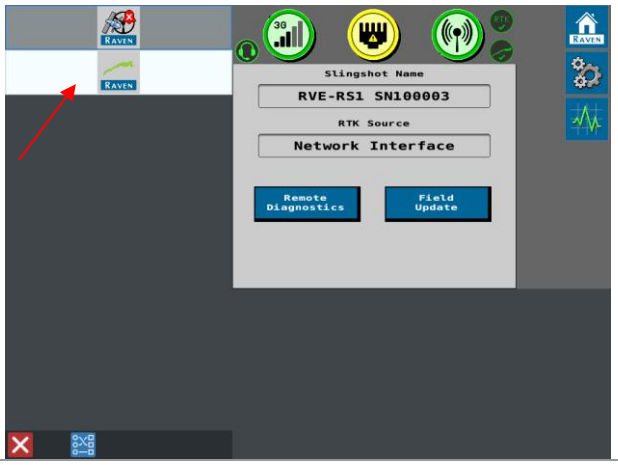
21	The system is calibrating the the terrain compensation. **Make sure** the machine and the cabine are standing still when calibrating is in progress!	
22	The system shows the location where the first step of the calibration is performed. Before the next step of the calibration can be performed, the machine needs to be turned 180 degrees (same place, only other direction). Turn around and make sure the triangle is in the correct place.	
24	When the machine is in the correct place, the triangle turns **green** and it is possible to press **Calibrate.** Before pressing calibrate, make sure the whole machine (including the cab) is completely not moving, shaking or so. Press Calibrate.	
25	The system is calibrating the terrain compensation. **Make sure** the machine and the cabine are standing still when calibrating is in progress!	

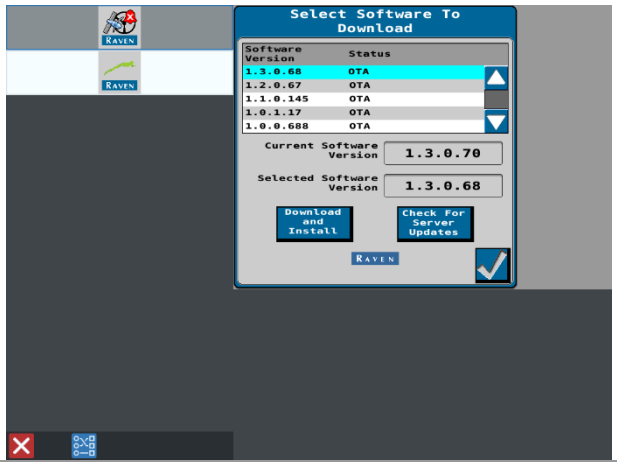
26	Calibration of terrain compensation has been completed. Select the '**Next**' arrow.	
27 *Caution! Wheels will turn!*	The next step is to calibrate the Wheel Angle Sensor Value. This can only be performed when driving between 1.6 – 6.4 km/h. Make sure the speed is between those limits and turn the steering wheel to the **left**.	
28 *Caution! Wheels will turn!*	Hold the steering wheel on the left and press the 'Voltage' underneath **left.** The current voltage is setup as the left voltage (check if the voltage on **left** changes to the current voltage).	

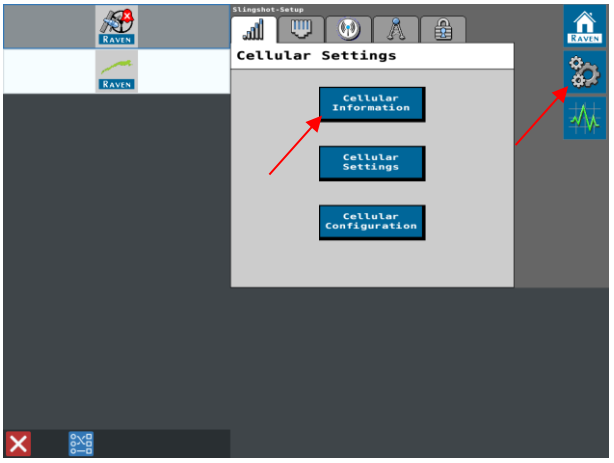
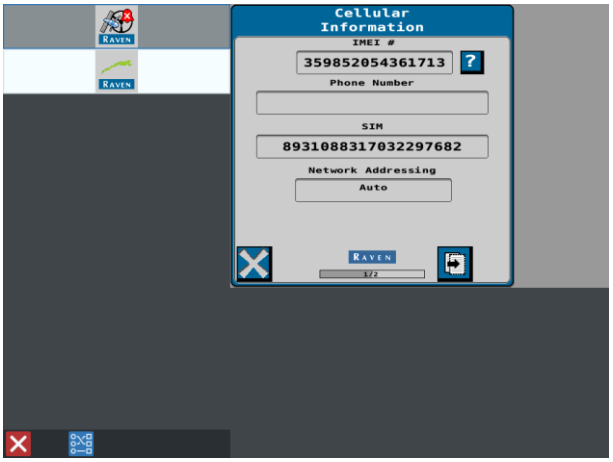
29 *Caution! Wheels will turn!*	Now turn the steering wheel to the **center** value. Drive manually straight to an object straight ahead.	
30 *Caution! Wheels will turn!*	While driving straight, hold the steering wheel straight and press the 'Voltage' underneath **center.** The current voltage is setup as the center voltage (check if the voltage on **center** changes to the current voltage).	
31 *Caution! Wheels will turn!*	Now turn the steering wheel to the **right.**	

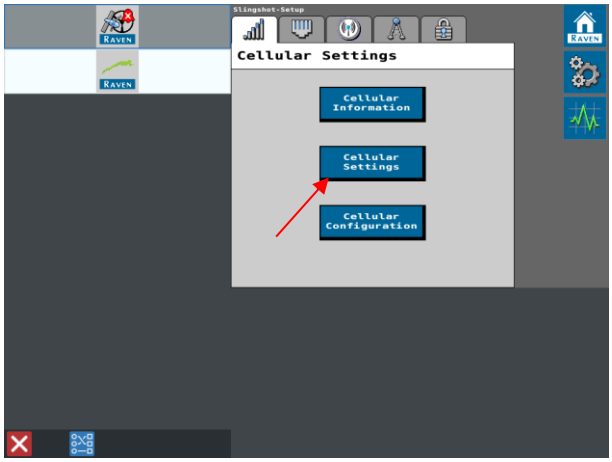
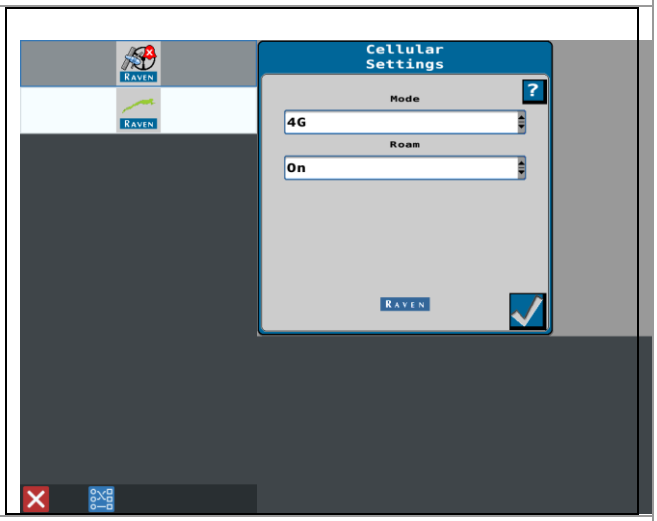
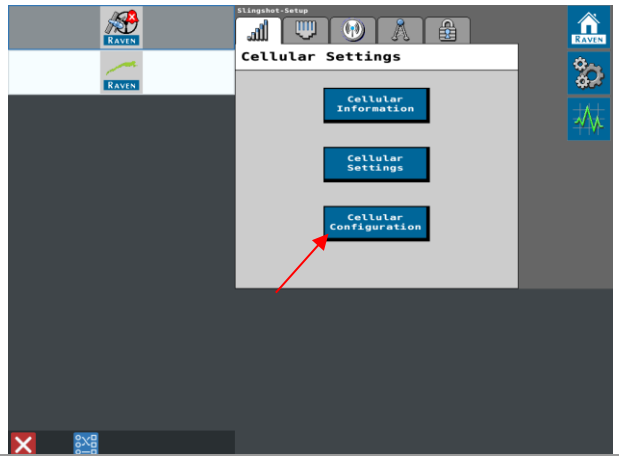
32 *Caution! Wheels will turn!*	Hold the steering wheel on the right and press the 'Voltage' underneath **right.** The current voltage is setup as the right voltage (check if the voltage on **right** changes to the current voltage).	
33	Quick overview of Wheel Angle Sensor Calibration. Select the '**Next**' arrow.	
34 *Caution! Wheels will turn!*	Automatic Steering Control Calibration, the system will perform an automatic calibration of the gain values needed for good steering performance.	

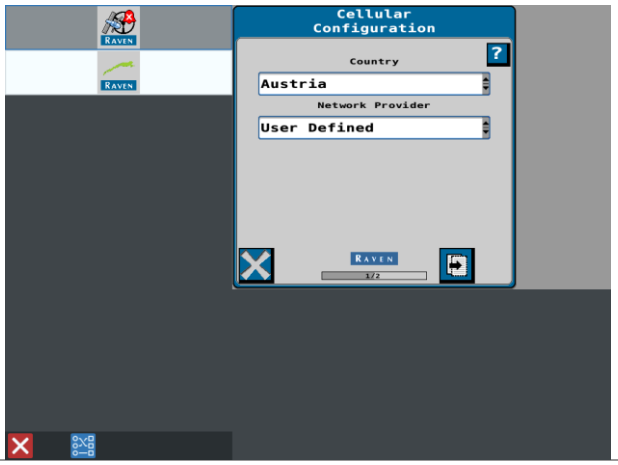
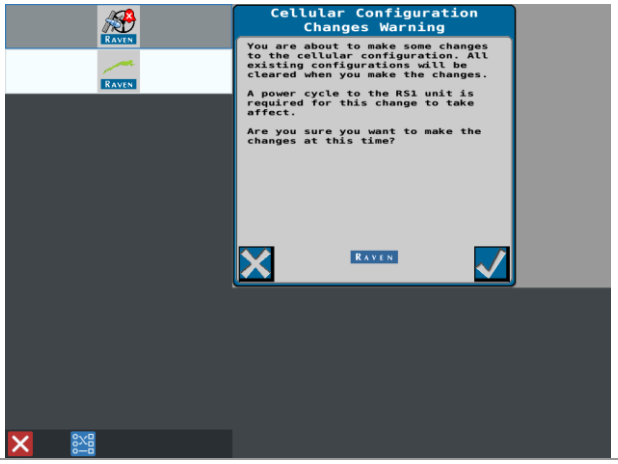
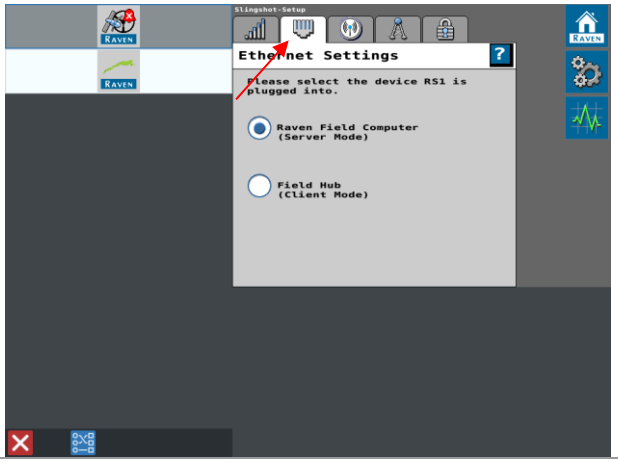
35 *Caution! Wheels will turn!*	First step of Automatic Steering Control Calibration, this step will take some time and wheels will first turn left, and start steering slowly to the right to get the minimal right steering gain. Make sure there is enough space around the tractor to turn circles. When there is no more space don't start turning the steering wheel but press the stop button and before turning the steering wheel.	
36 *Caution! Wheels will turn!*	One of the steps the automatic calibration performs to setup the correct gain values. In this step the system is calculating the right gain values.	
37 *Caution! Wheels will turn!*	Calculation of the left gain.	

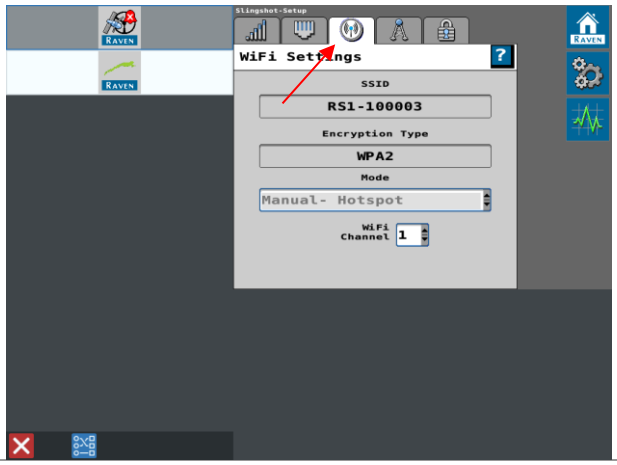
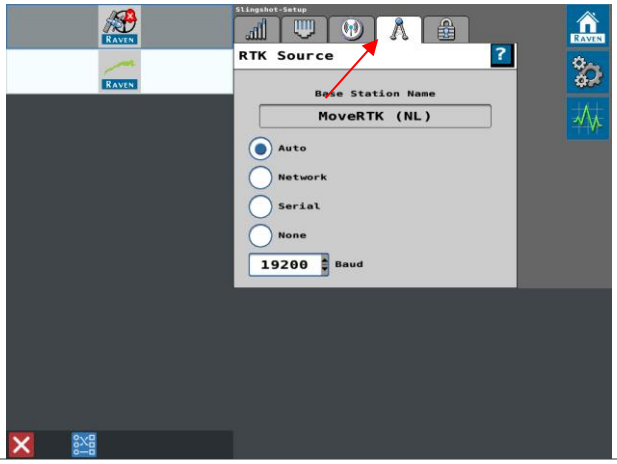
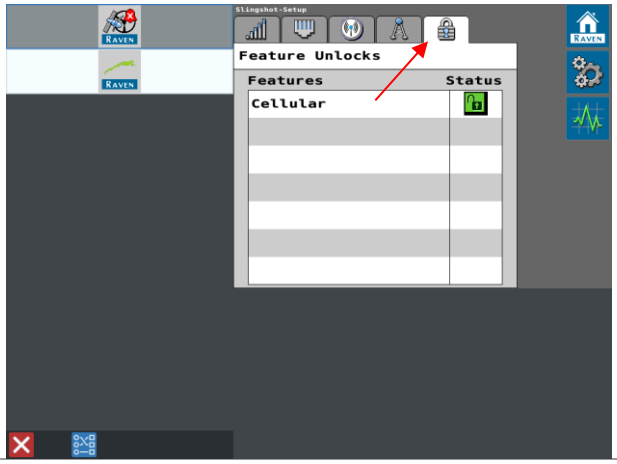
38	Short overview of the calculated gains during automatic calibration. Select the '**Next**' arrow.	
39	The PWM table of the system gains after automatic calibration.	
40	This is the main menu of the Slingshot UT.	

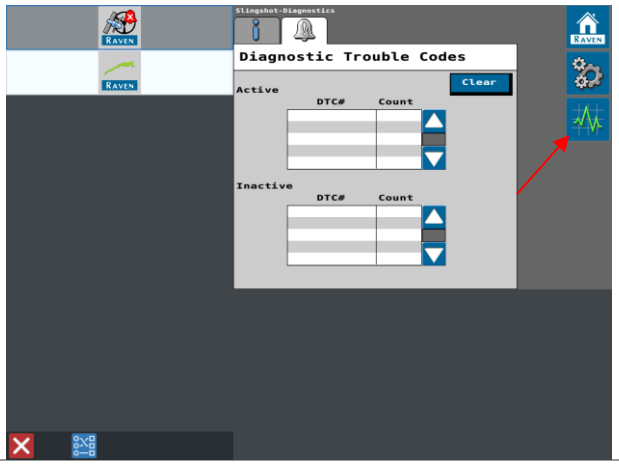
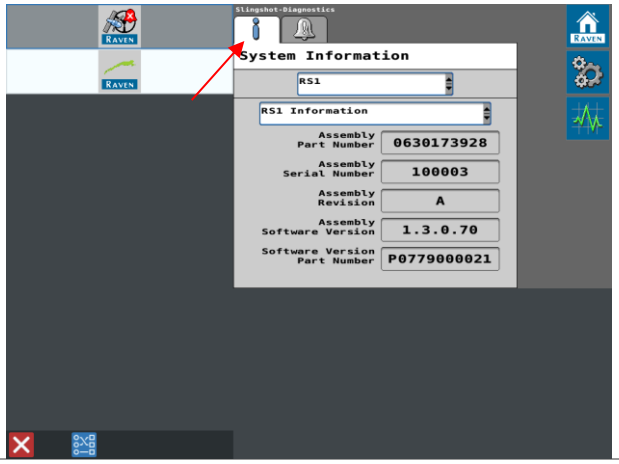
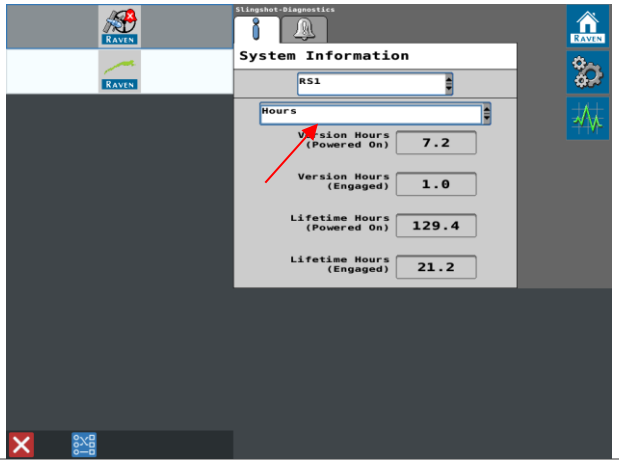
41	Slingshot remote diagnostics license agreement.	
42	Press the Field Update widget to update the RS1.	
43	Press Check For Server Updates to check if there is an update available. Then press Download and Install.	

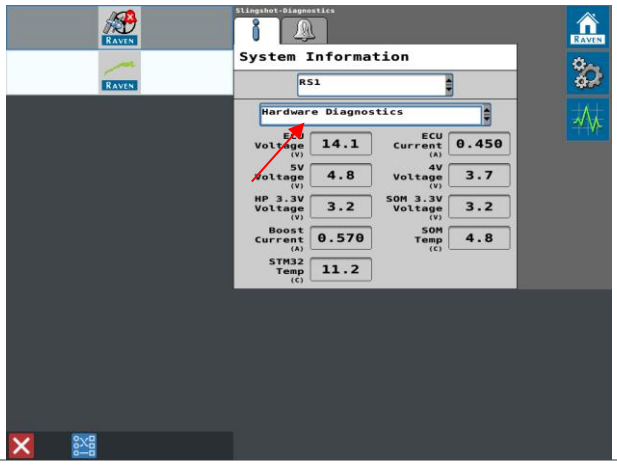
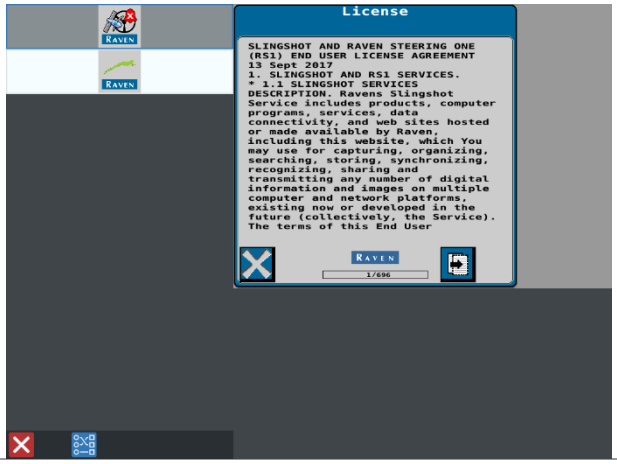
44	Press the settings widget to get to the Cellular Settings screen of the Slingshot UT. Press Cellular Information	
45	At the Cellular Information screen the IMEI and the SIM number can be found.	
46	Cellular Information of the RS1. In this case the registerd country is not of any importance. Network Provider should be set to User Defined.	

47	Press the Cellurar Settings widget.	
48	Cellular Settings of the RS1. When the 4G coverage is not sufficient, the RS1 could be set to receive 3G or 2G.	
49	Press the Cellular Configuration.	

50	Check if Network Provider is set to User Defined. Select the correct country.	
51	Warning screen about changes in the Cellular Configuration. Make sure the RS1 is restarted after applying changes to Cellular networks. It might take a few hours for the RS1 to restart.	
53	Press the Ethernet Settings widget to select the device the RS1 is currently plugged in to.	

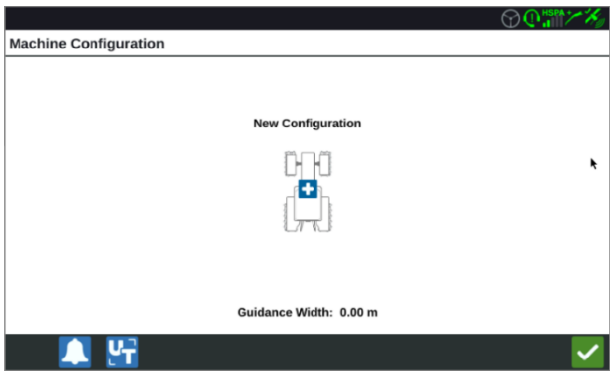
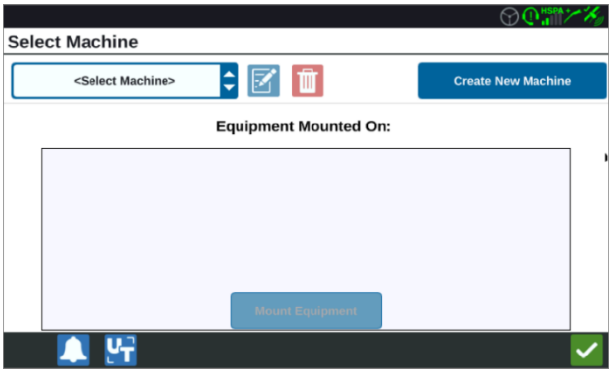
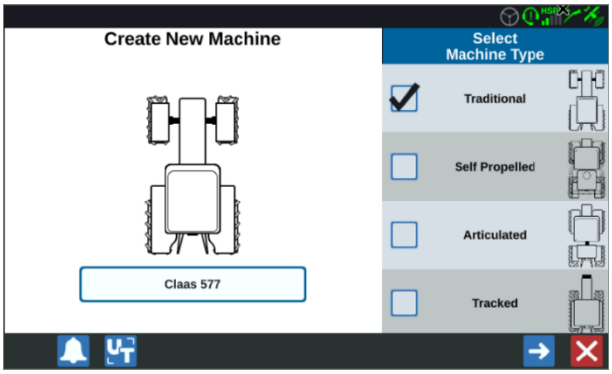
54	Press the Wifi Settings Widget to go the WiFi settings of the RS1.	
55	RTK source selection of the RS1, in this screen it is possible to change Baud rate of the RS1.	
56	Status of unlocks on the RS1	

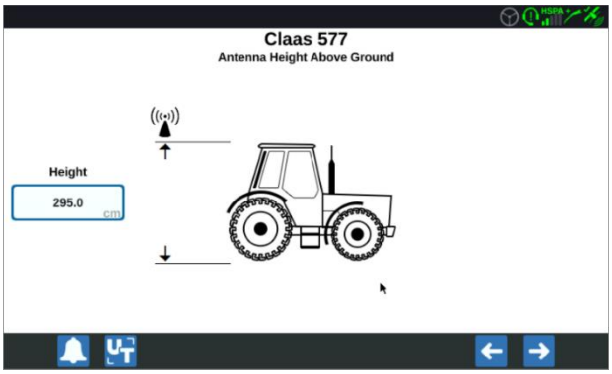
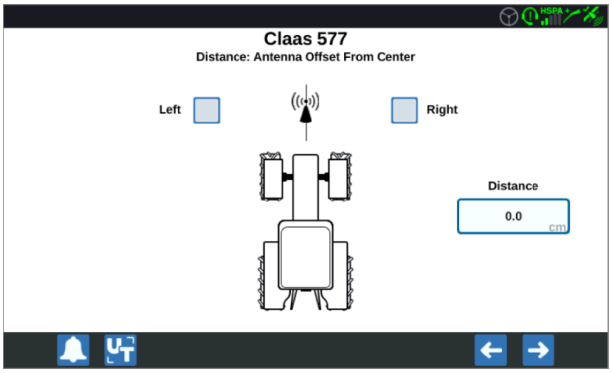
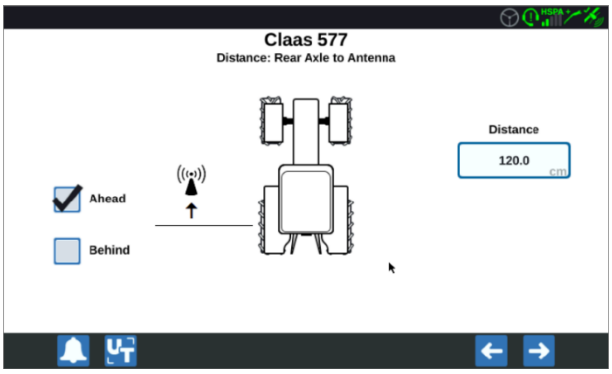
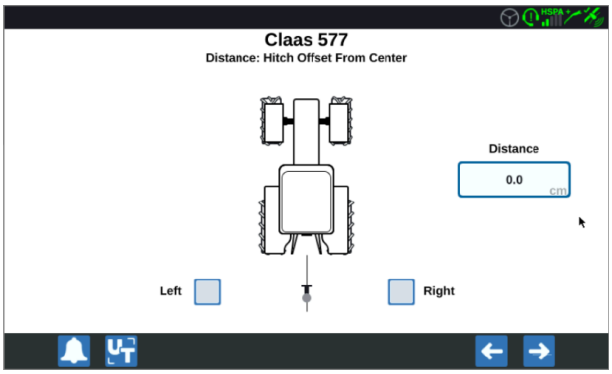
57	Press the Diagnostics widget to go to the Diagnostic Trouble Codes of the RS1	
58	Press the System Information widget to get information about the RS1.	
59	The amount of hours RS1 has been switched on.	

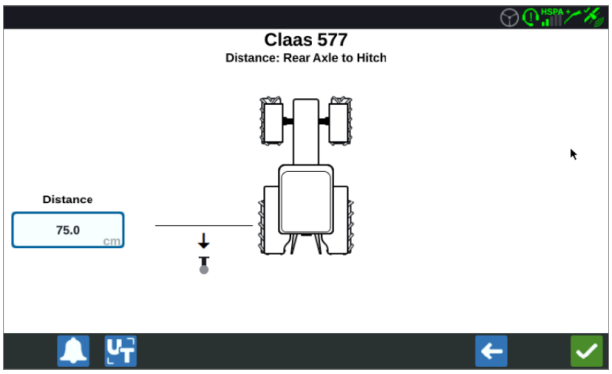
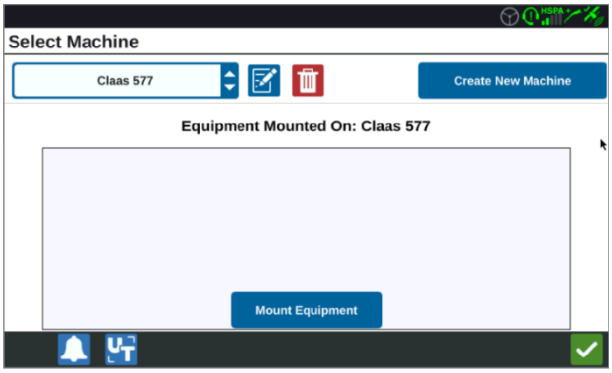
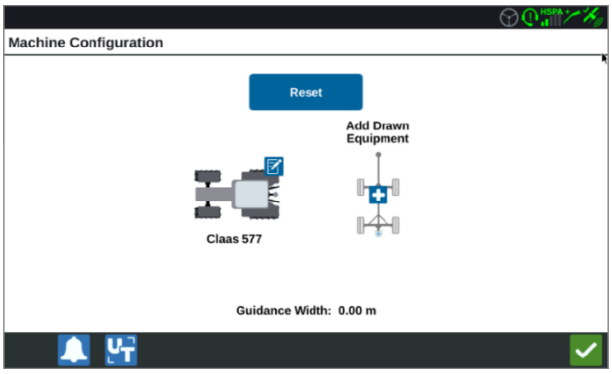
60	Hardware Diagnostics of RS1.	
61	License agreement of Slingshot and RS1.	

Intentionally left blank.

2 SETUP TRACTOR PROFILE IN GARAGE

#	Description	Figure
62	Go to the settings page and open the '**Machine**' Garage.	
63	Press the + sign for a new configuration.	
64	Press on '**Select New Machine**'.	
65	Select '**Traditional**' (if it is a front steered tractor). Select another machine type in case it is another type.	

66	Measure and enter the height of the antenna. Select the '**Next'** arrow.	
67	Measure and enter the antenna offset (if the antenne is not mounted in the center). Select the '**Next'** arrow.	
68	Measure and enter the distance between the rear axle and the antenna. Select the '**Next'** arrow.	
69	Measure and enter the Hitch offset from the center (if the hitch is not in the center of the machine). Select the '**Next'** arrow.	

70	Measure and enter the distance from the rear axle to the hitch. Select the '**Next'** arrow.	
71	Press the green checkmark.	
72	The machine is now entered and configured in the Machine Garage. To add implements and Guidance widths, refer to the CRx User Manual. Press the green checkmark to leave the Machine Garage.	
73	Press '**System Shutdown**' to shutdown the CRx.	

Hoornseweg 22
1775 RB, Middenmeer
The Netherlands

Phone: +31 227 54 93 00
Web: www.raveneurope.com
Email: service-eu@ravenind.com

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