



CHCNAV NX510 FAQ



Precision Agriculture | October 2023

1	Straightness.....	4
1.1	Regular inspection	4
1.2	Parameters adjustment	4
1.2.1	With GA-Sensor	4
1.2.2	Without GA-Sensor	5
1.2.3	Special scene	6
2	Signal.....	7
2.1	No satellites	7
2.2	No stable satellites	8
2.3	Single/Autonomous.....	9
2.4	Float.....	9
3	Tablet.....	10
3.1	Touch screen.....	10
3.2	Stuck in the startup interface	10
3.3	SIM card.....	10
3.4	Power.....	10
3.5	Restarting.....	11
4	Motor	11
4.1	Communication error	11
4.2	Manual override	11
4.3	LED light.....	11
4.4	Getting hot.....	12
4.5	Turning.....	12
5	PA-3	13
5.1	Three lights are on.....	13
5.2	Two lights are on	13
5.3	No satellites	13
6	GA-Sensor	14
6.1	Raw data	14
6.1.1	Raw data no changes	14

6.1.2	Raw data changes a lot	14
7	AGNAV3.0 software	15
7.1	Software registration	15
7.2	Software and firmware mismatching	15
7.3	Software recharge	15
7.4	Software crash	16
7.5	Serial port failure	16
7.6	Speed	17
7.7	Calibration issue	17
7.7.1	Steering wheel calibration	17
7.7.2	Installation error calibration	18
8	Information collection.....	19
8.1	Common information collection	19
8.2	Algorithm data collection	20
8.3	Differential data collection	20
8.4	Spline measurements	20
9	Different vehicles configuration.....	20
9.1	Rear wheel.....	20
9.2	Tracked.....	21
9.3	Articulated	21

1 Straightness

1.1 Regular inspection

1. Check if with too large steering wheel clearance;
2. Check if the implement is installed not tightly;
3. Check if tractor head shakes or not (whether the counterweight is sufficient);
4. Check if there is an installation problem; (whether the controller, angle sensor, steering wheel, etc. are fixed tightly, and whether the parts requiring horizontal installation are too inclined);
5. Check if there is a calibration problem (whether the vehicle size is correct, and whether the calibration value is within a reasonable range);
6. Check if the ground condition too bad;
7. Check if there is a problem with the tractor itself (heavy steering, large steering clearance).

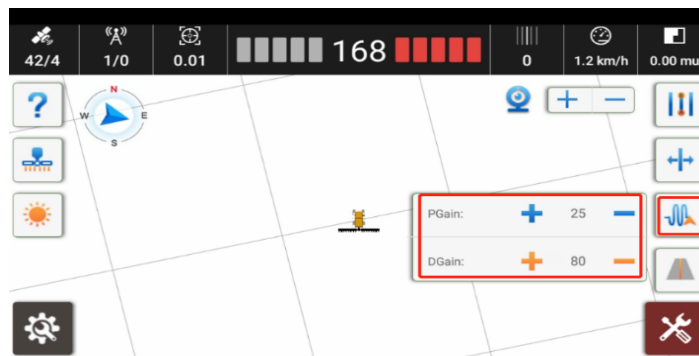
1.2 Parameters adjustment

1.2.1 With GA-Sensor

PGAIN: 25 or 20

DGAIN: 60 or 80

Recommended match: 25/80 (Small horse tractor)



Advanced scene:

- a) Be able to try to set Online aggressiveness as 130 when lateral deviation is slowly changing to 0

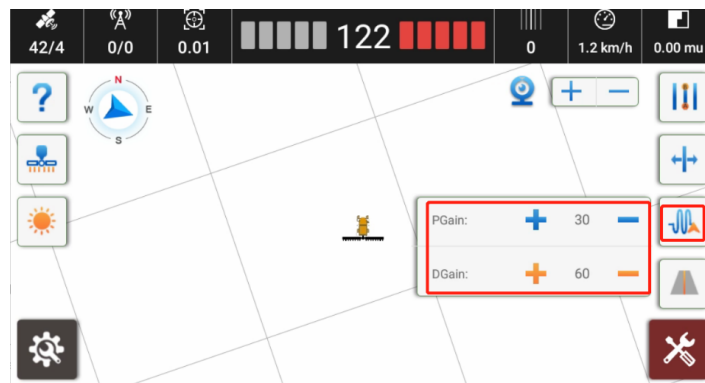
b) Be able to try to set Online aggressiveness as 70 when steering wheel shake frequently and there is crooked path.

1.2.2 Without GA-Sensor

PGAIN: 25 or 30

DGAIN: 40 or 60

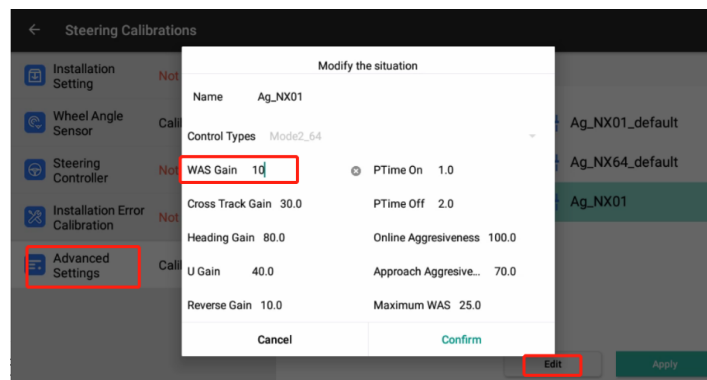
Recommended match: 30/60 (Small horse tractor)



Advanced scene:

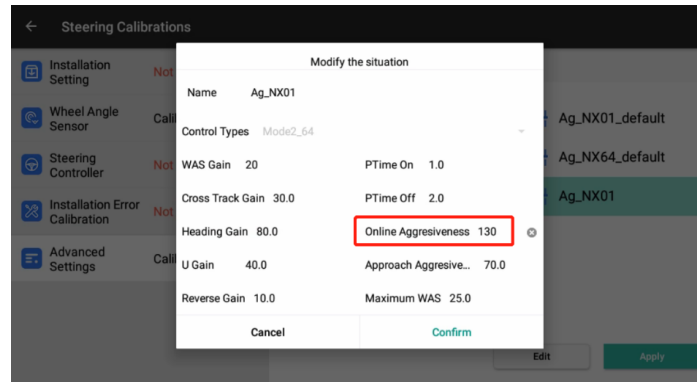
1. Steering sensitivity: 10

Default is 20. When the tractor condition is poor, the ground is soft, or on a slope, it is prone to have S-turns, so it is necessary to reduce steering sensitivity



2. Online aggressive: 130 or 70

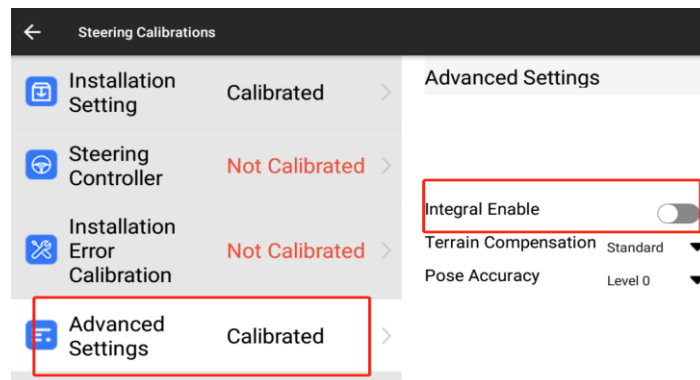
a) Be able to try to set Online aggressive as 130 when lateral deviation is slowly changing to 0



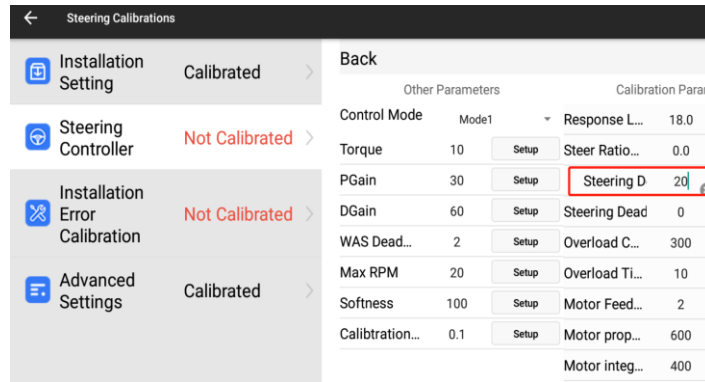
b) Be able to try to set Online aggressive as 70 when steering wheel shake frequently and there is crooked path.

1.2.3 Special scene

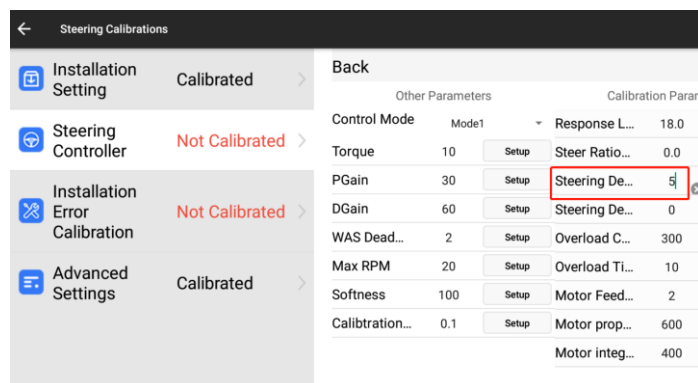
1. Restart system;
2. Turn off [Integral] if there is a fixed deviation;



3. For low horsepower tractors, if the steering ratio is less than 15 and the steering wheel shakes slowly, it is necessary to increase PGAIN value(25/30/35)
4. Without GA sensor mode, steering clearance adjustment: the default dead zone is 10, representing a steering clearance of 20 degrees (a double relationship); If the tractor steering clearance is large, it is necessary to increase dead zone value in steps of 5 (15/20/25);



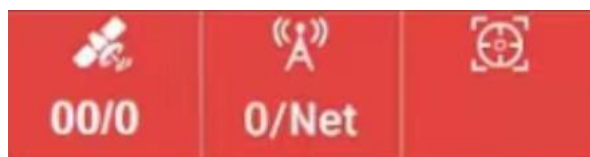
If the steering clearance of CASEIH, Deere, and Krass tractors is small and the steering wheel swings frequently from side to side, it is necessary to reduce the dead zone value and set it to 5;



2 Signal

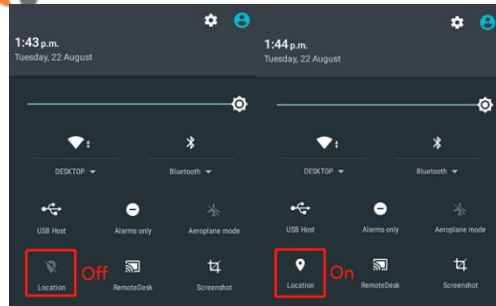
2.1 No satellites

A. The satellite bar is displayed abnormally with the first frame displaying 00/0.



Please check if the PA-3 blue light flashes per second, if it does not flash, pls replace/repair the PA-3. If PA-3 blue light flashes normally, pls following the steps as below:

1. Restart the whole system.
2. Swipe the screen down from the top of the tablet to open the control panel and check if **[Location Information]** is grey and off. If it is on, turn it off and restart the whole system.



3. Check the software version and update to the latest version.
4. Re-plug the main harness or replace the main harness
5. Replace/repair the PA-3 receiver, maybe internal IMU is faulty.

B. The satellite bar is displayed abnormally, with the first frame displaying null/0.



Please check if the PA-3 blue light flashes per second, if it does not flash, pls replace/repair the PA-3. If PA-3 blue light flashes normally, pls following the steps as below:

1. Re-plug the main harness;
2. If GASenor is installed, reboot the device after disconnecting its harness, and if the signal returns to normal after rebooting, select **Without WAS** mode to continue operation;
3. Replace display, receiver and main harness one by one.

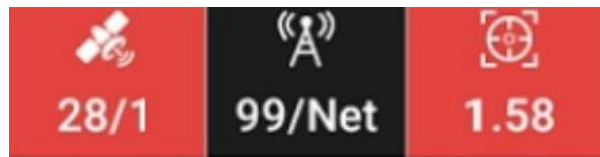
2.2 No stable satellites

Check whether there is interference around (positioning terminal or high-power electrical appliance), and if any, power off or remove the interference part.



2.3 Single/Autonomous

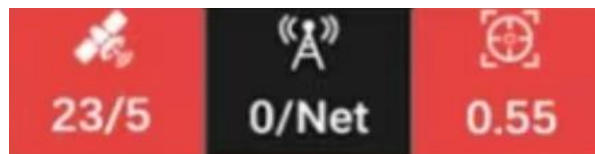
The satellite bar is displayed abnormally, with the first frame displaying **/1.



1. If all internet is good (Network mode)
2. If the baseline is too long (Radio mode)
3. If the base station is encrypted (check the PA-3 green light is flashing or not)
4. If using MSM6 or MSM7 message with controller network
5. Restart and reset PA-3
6. Reconnect the main cable
7. Try to replace the mainboard or replace the receiver

2.4 Float

The satellite bar is displayed abnormally, with the first frame displaying **/5.



1. If the environment is good
2. If the baseline is too long (Network and radio mode)
3. If the server only provides one user connection
4. Turn on the Heading float feature
5. Restart and reset PA-3
6. Check the software and firmware version, and pls update to the latest firmware version

3 Tablet

3.1 Touch screen

1. Restart tablet for 3 times, it is necessary to replace the tablet or replace the front shell if still not working;
2. After replace the front shell, if still not working, pls update the tablet system to latest one;
3. If still not working, it should be tablet mainboard issue and necessary to replace with new mainboard or replace with new tablet.

3.2 Stuck in the startup interface

It is necessary to update the tablet system with USB cable, pls contact CHCNAV technicians for more support.

3.3 SIM card

If No SIM card or SIM card not recognized, pls follow the steps as below:

- 1) Open the SIM card slot and check whether the SIM card is inserted properly, and whether the card is inserted reversely or falling into the tablet pull slot;
- 2) Power off and restart the tablet to see if it has not yet appeared;
- 3) Replace the SIM card and tablet in turn.

3.4 Power

If the tablet can not be powered on,

- 1) Reconnect the harness connector again;
- 2) If the receiver can be turned on, please replace the tablet or repair thee tablet;
- 3) If the receiver can not be turned on, please check the power supply cable/battery and try to repair it or replace the cable.

3.5 Restarting

- 1) Check whether the power cable is normal and connected to the battery correctly;
- 2) Check whether the vehicle battery is lower than 7V.

4 Motor

4.1 Communication error

During system startup or use, communication abnormalities or steering wheel motor hardware abnormalities are usually caused by hardware failures. The problem localization and troubleshooting methods are as follows:

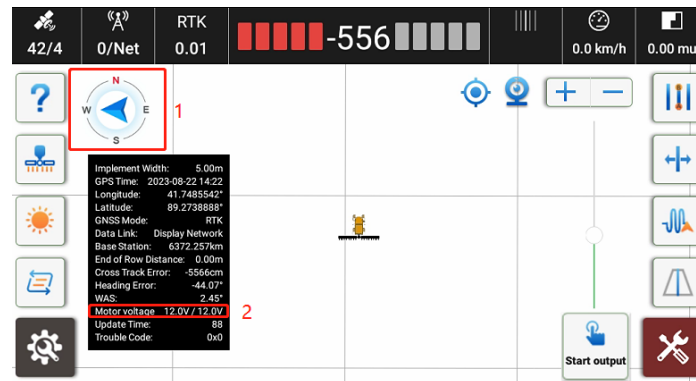
1. The error code is 0x10000 and the error message is #16;
2. Reconnect the motor cable;
3. Restart the whole system;
4. Replace the motor, PA-3 and main cable in turn.

4.2 Manual override

1. Change the torque to 15 and see if it works or not;
2. Restart the system and try it again, please do not touch the steering wheel when start the system;
3. Check the battery voltage and power cable connection;
4. When the tractor is stationary, click on automatic steering. Manually disengage the motor to confirm whether it is with strong power, if the motor is not strong or has low power, it needs to be replaced;
5. When taking to the line at a large angle or occasionally prompting Manual override, it is necessary to reconnect the motor connector or replace the motor cable in turn.

4.3 LED light

If the power indicator light is off or the red indicator light, pls check the system voltage in the software status information. If it is less than 9V, it is necessary to check the vehicle battery, harness connections and fuses; If it is greater than 9 V, it is necessary to replace the motor and harness in turn.



4.4 Getting hot

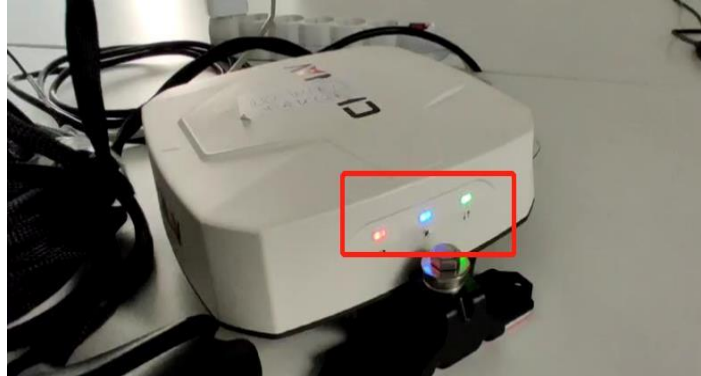
- 1) Check the steering of the original tractor to see if the steering is heavy, the fuel is unloaded, and the tire pressure is insufficient. It is recommended to repair the vehicle.
- 2) Check the motor installation, reconnect the motor cable and reboot the motor in turn.
- 3) Replace the motor and motor cable in turn.

4.5 Turning

If the motor does not turn or turns to one direction all the way, pls follow the steps as below:

- 1) Check if the tractor status is reversing, and if so, click the heading reverse;
- 2) Restart system and check again;
- 3) Update to latest motor firmware if it is new motor CEST5.1;
- 4) Reconnect or replace the harness in turn if it is old motor CEST3.0;
- 5) Replace the motor.

5.1 Three lights are on



Restart the system first. If still not working, please contact CHCNAV technicians to debug remotely with special cable. If no this special cable, it is necessary to replace the receiver or replace the mainboard.

5.2 Two lights are on

This phenomenon is caused by power off in the process of upgrading the firmware.

- 1) The system is recovering, so please wait for ten minutes, if normal, then re-upgrade the firmware to latest one.
- 2) If still not working, it's necessary to replace the receiver/mainboard.

5.3 No satellites

If the blue light flashes each 5 seconds which means no satellites tracked, please follow the steps as below:

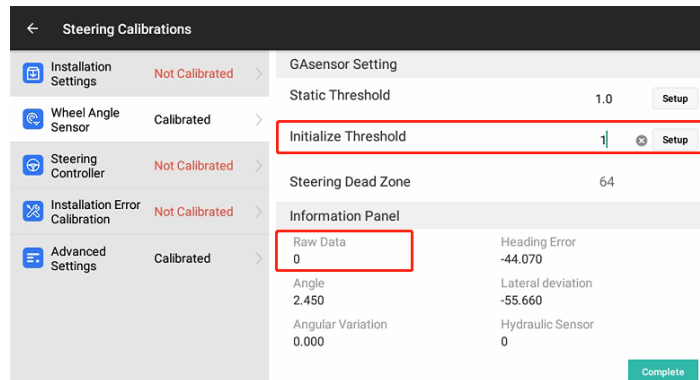
- 1) Check the environment where the equipment is located;
- 2) Clear the ephemeris;
- 3) Update to the latest PA-3 firmware;
- 4) Replace the receiver after restarting 3 times, or replace the internal antenna/mainboard.

6 GA-Sensor

6.1 Raw data

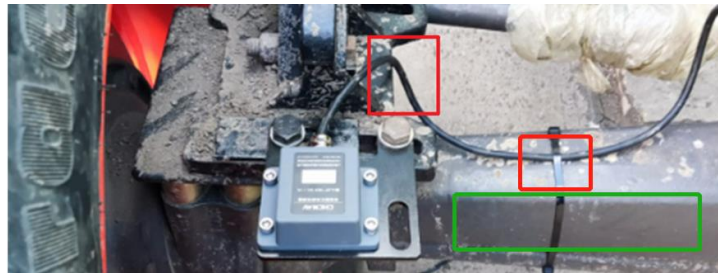
6.1.1 Raw data no changes

1. Restart the system.
2. Replace the GASensor and GASensor cable in turn



Notification:

- b) Fix the cable on the side of the axle with ribbon instead of the top side;
- c) Improve the wire quality;
- d) Reserve a sufficiently long wire.



6.1.2 Raw data changes a lot

1. Check the raw data changes and if changes a little within ± 100 and also display the GASENSOR not ready, please increase threshold to 1;
2. If changes a lot to ± 600 , it is necessary to replace the GA sensor.

7 AGNAV3.0 software

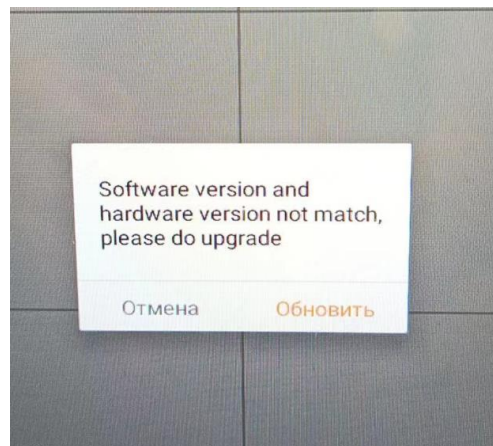
7.1 Software registration

1. File registration/Code registration instructed as the user manual
2. Online registration

Keep tablet with internet, and provide tablet SN to CHCNAV technicians, finally restart the software to activate the new registration after informed by CHCNAV technicians

7.2 Software and firmware mismatching

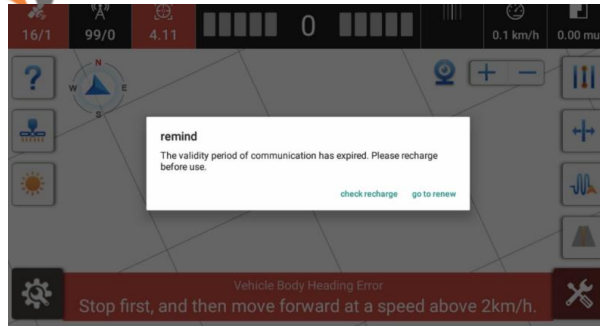
Software and firmware are not matched, software is new one and firmware is old one, vice versa, so it is necessary to update the software/firmware both to the latest one.



7.3 Software recharge

Old software before 20220524 version has this issue, so please follow the steps as below:

- a) Keep tablet with internet, and provide tablet SN to CHCNAV technicians, restart the software to refresh after informed by CHCNAV technicians, finally the issue will be solved.
- b) Or updating to the latest software version can solve the issue as well, please update the firmware as well otherwise another mismatching issue will appear.



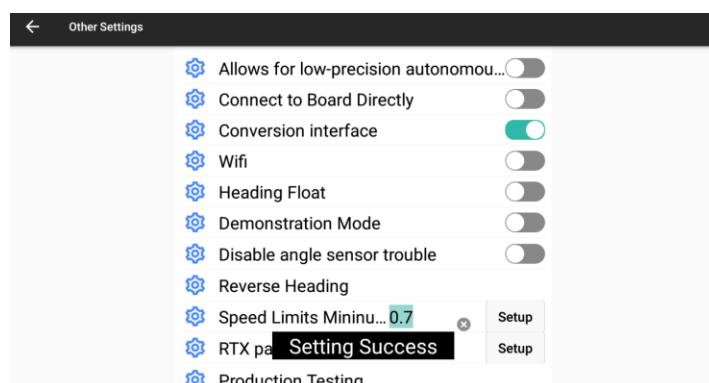
7.4 Software crash

Mostly the calculation exceeds the threshold when doing curve lines or boundaries, it is necessary to improve algorithm robustness. When meet this issue, please follow the steps as below:

- 1) Check the internal memory is full or not, it is necessary to delete the AgBackup folder in CHCNAV/AgNav3.0 path, then the issue will be solved;
- 2) If not the internal memory issue and do not need the data, it is able to delete the farmConfig.db in the /CHCNAV/AgNav3.0/Config path, then the issue will be solved quickly and not influent the field work.
- 3) If need the data, please copy the CHCNAV and Crash folder and send it to the CHC technicians for recovery.
Crash folder is in the Android/Data/com.huace.agnav30_os/files.

7.5 Serial port failure

When connect to NTRIP with controller network mode and it displays the serial port failure, it is necessary to turn on the conversion interface to switch to the CAN port from serial port for data transfer.



7.6 Speed

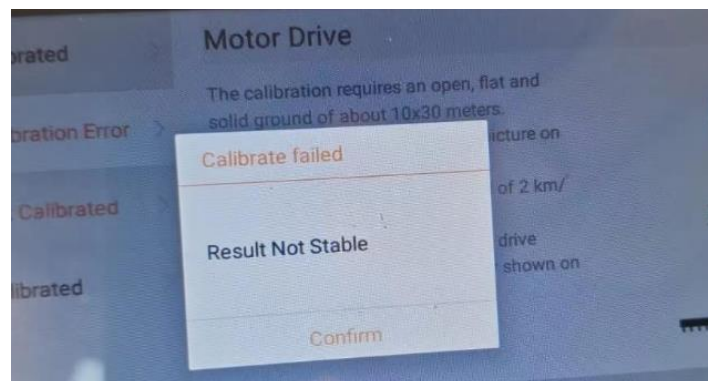
Usually it displays wrong speed in the AGNAV software like 3.6KM/H and keep constant, also with not taking to the guideline.

1. Restart the system;
2. Check the software and firmware and update to the latest one;
3. Clear the satellite ephemeris in the software;
4. Replace the PA-3;
5. Replace the tablet.

7.7 Calibration issue

7.7.1 Steering wheel calibration

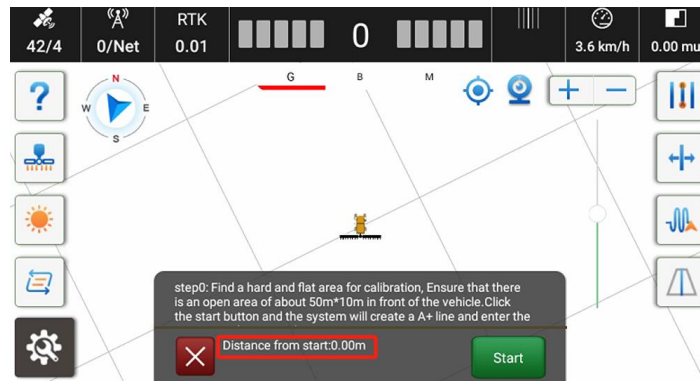
7.7.1.1 Result not stable



1. Restart the system and try again.
2. The ground is bumpy and uneven, please find a flat ground.
3. Vehicle speed is too slow, please increase the speed.
4. The PA-3 receiver vibration is excessive, please reinstall the PA-3 on a stable location.
5. The IMU recognition error, forward and reverse recognition error, please click Heading reverse in the software.
6. The vehicle condition is not good, please repair the tractor.

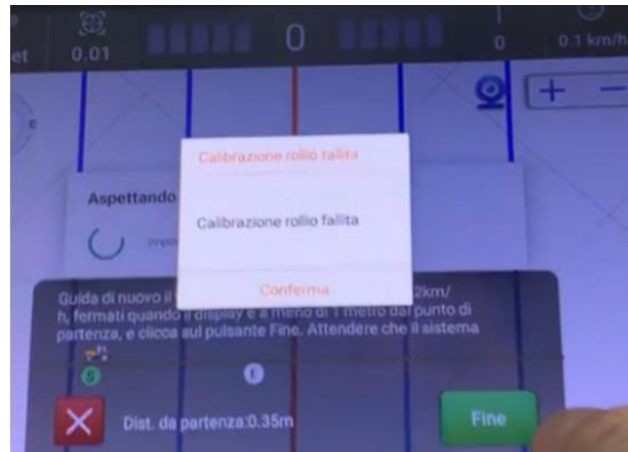
7.7.2 Installation error calibration

7.7.2.1 Distance not increasing



1. IMU recognition error, please restart the system and try again.
2. Update to latest software and firmware version which optimize it.

7.7.2.2 Calibration roll failed



1. Speed is too fast and can not collect too much required data, please lower down the speed and try again.
2. The PA-3 receiver vibration is excessive, please reinstall the PA-3 on a stable location.

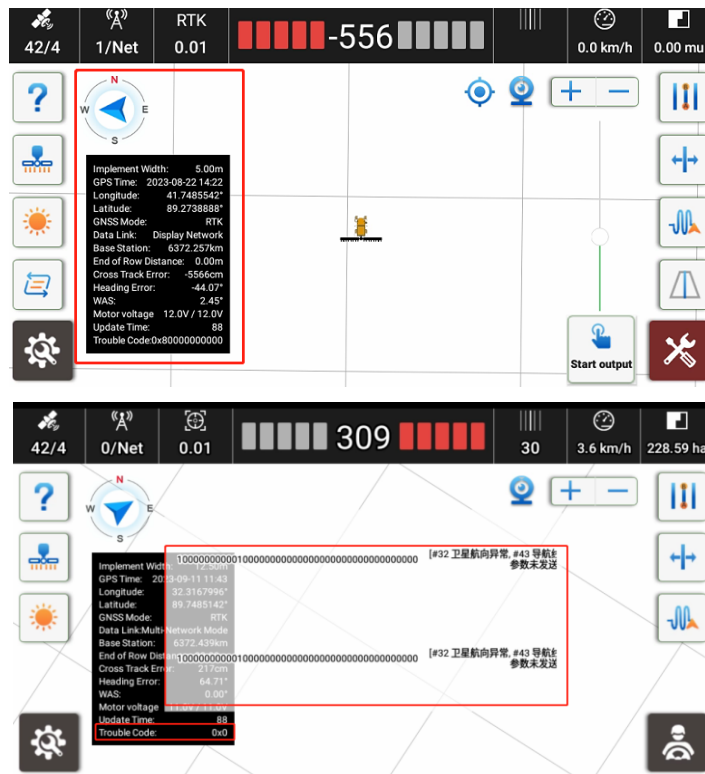
8 Information collection

8.1 Common information collection

1. Take a photo/video of FW and SW version.



2. Take a photo/video of COMPASS.



3. Take a photo/video of PARAMETER.

Parameters			
Real-time Information		SIM Card Information	
Pla...	-5304712.550,-1304968.560	Angle of Pitch	1.220°
Angle of Roll	-0.240°	Raw Data	0
Heading Angle	355.630°	Tablet SL...	IMEI 863163045660794 Networked
Size Parameter (m)		Installation parameters	
Wheelbase (A)	2.500	Implement Tow Point (B)	0.000
Axle Height (F)	0.750	Front Hitch (G)	2.000
To Middle Axle (C)	0.000	To Rear Axle (D)	0.000
Antenna Height (E)	3.000	Implement's Width	5.000
Row Spacing	0.000	Center Offset	0.000
Driver Parameters		Scene parameters	
PGain	25	Pitch Angle Offset	0.000
DGain	80	Roll Angle Offset	0.000
Response Linearity	18.000	Installation Angle Offset	0.000
Steering Dead Zone	0	Current scene	Ag_NX01_default Subscription model
Mounting Bias		Other information	
Vehicle Type	Front Steer	TNC Connectors	Rear
Steering Controller	Motor Drive	LED Panel	Up
Wheel Angle Sensor	Without WAS	Gasensor-Installation	Left Wheel
Steering Mode	CEST51	Gasensor-Orientation	Label Up
Nav. controller	PA-3	Gasensor-Type	-
Cross Track Gain	35.000	Wheel Version	1.19-1.1
Heading Gain	100.000		
Reverse Gain	10.000		

4. Provide the SN and PN of the tablet, PA-3 and motor.
5. Send the above pictures to technicians along with the problems.

8.2 Algorithm data collection

Usually the algorithm may have some issues so it is necessary to collect algorithm data as below instruction,

https://chcnavigation.jianguoyun.com/p/DeptJFUQtq_UCxji4J4FIAA

8.3 Differential data collection

Usually PA-3 can not get Fix solution so it is necessary to collect differential data as below instruction,

https://chcnavigation.jianguoyun.com/p/DWSKX7IQtg_UCxjm4J4FIAA

8.4 Spline measurements

Some vehicles spline parameters are unknown so the sleeve is unknown either and it is necessary to measure the spline parameters as the below instruction,

https://chcnavigation.jianguoyun.com/p/DeFnbG4Qtg_UCxjy4J4FIAA

9 Different vehicles configuration

9.1 Rear wheel

PGain: 30/35

DGain: 60/80

Steering Deadzone: 15

Online Aggressiveness: 60/70

Combined harvester---Rear wheel steer



9.2 Tracked

PGain: 25/30

DGain: 80

Max RPM: 10

Response Linearity: Not more than 6.0 and please manually change to 6 if it is not 6 after calibration.

Cross Track Gain, Heading Gain: 30/80. It is available to change to 25/70 if the steering wheel adjustment is large.

PTime On: 1.0. When tractor is reversing, it can not take to the line, please change to 1.2

PTime off: 0.8

9.3 Articulated

PGain: 10

DGain: 60/80

Max RPM: 10

Online aggressiveness: 70-100