SingularXYZ

SAGRO200 Auto-steering System User Manual

V1.0 Modified on2024.01.11

Proprietary Notice

Information in this document is subject to change without notice and does not represent a commitment on the part of SingularXYZ Intelligent Technology Ltd. The software described in this document is furnished under a license agreement or non-disclosure agreement. The software may be used or copied only in accordance with the terms of the agreement. It is against the law to copy the software on any medium except as specifically allowed in the license or non-disclosure agreement.

No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose without the express written permission of a duly authorized representative of SingularXYZ Intelligent Technology Ltd.

Corporate Office

SingularXYZ Intelligent Technology Ltd.

Address: Floor 2, Building A, No. 599 Gaojing Road, 201702 Shanghai, China

Tel: +86-21-60835489

Fax: +86-21-60835497

Website: https://www.singularxyz.com

E-mail: singularxyz@singularxyz.com

Technical Assistant

If you have any questions that can't be solved in this manual, please contact your local SingularXYZ distribution partner. Alternatively, request technical support from SingularXYZ Intelligent Technology Ltd.

Support Email: support@singularxyz.com
Support Skype: Support.SingularXYZ

Your feedback on this manual will help us improve it with future revisions.

Contents

1 Components

The following parts are the system components of SAgro200:

Name	Figure	Quantity	Name	Figure	Quantity
S200 GNSS Receiver		1	Gyroscope Cable		1
GNSS Receiver Cable		1	Front Wheel Gyroscope Base Plate		1
Radio Antenna		1	T10 Tablet		1
Electric Motor		1	Bracket		1
Motor Bracket		1	Camera		1
Steering Wheel		1	Camera Cable		1
Spline Sleeve		1	Main Transmission Cable		1
Screw Accessories		1	Power Cable		1
Gyroscope		1	4G Antenna		1

2 Installation

2.1 S200 GNSS Receiver

The function of S200 is to receive satellite signals and obtain tractor body attitude information. It is best to install it in a secure position on the roof, coinciding with the vehicle's central axis.

Measure the central axis place

Install the S200 Receiver

2.2 Radio Antenna

The radio antenna is used to receive the radio signal, you should install it in the outside of the tractor.

Radio Antenna

2.3 4G Antenna

The Function of the 4G antenna is to receive the 4G signal, you should install it in the outside of the tractor.

4G Antenna

4G Antenna cable

2.4 Motor and Steering Wheel

Please install the motor, spline sleeve, steering wheel, motor bracket, connect the motor with the main transmission cable.

Spline Sleeve And Motor

Spline Sleeve And Steering Wheel

Motor Bracket 1

Motor Bracket 2

Overview

Main Transmission Cable Connection

2.5 Front Wheel IMU

The Front Wheel IMU should be installed on the steering wheel of the car, and the port of the IMU should be orient to the tractor body. The IMU needs to move with the steering wheel. Connect the port of the front wheel IMU with the Gyroscope cable.

Front Wheel IMU

Gyroscope Cable

2.6 T10 Tablet

Install the bracket on the tablet, and connect the port 3 in the back of the tablet with the tablet port of the main transmission cable.

Tablet Bracket 1

Tablet Bracket 2

Tip: If there is no appropriate handrail in the cab, self-tapping screws can be used to secure the RAM ball in a convenient position.
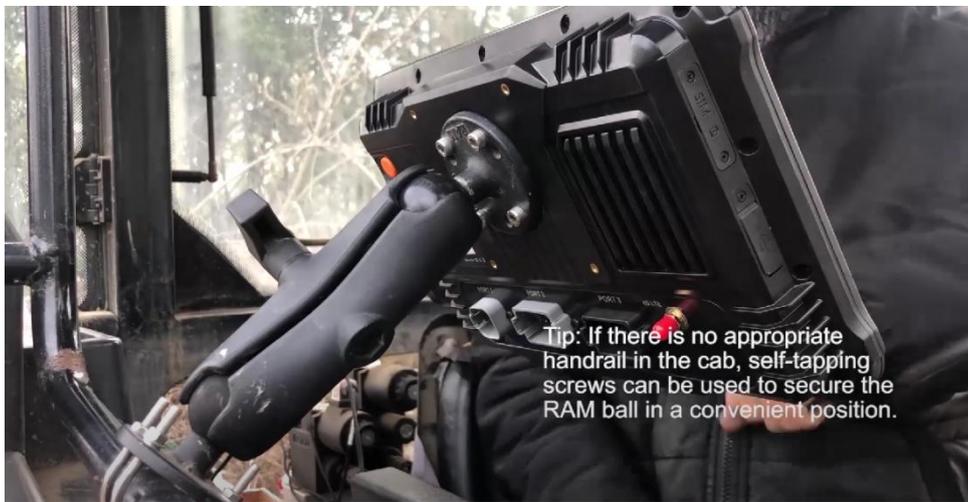
Tablet Bracket 3

Main Transmission Cable Connection

2.7 Camera

If you want to use the camera to observe the rear view of the car, you should install it on the back of the tractor, and connect it to the tablet port 1 via camera cable.

Camera

Camera Cable Port Connection

2.8 Battery Connection

Connect the tractor battery to the power cable. And connect the Power port on the main transmission cable to the power cable.

Battery Connection

Power Cable Connection

2.9 Some Other Cables Connection

For the front wheel IMU cable, S200 GNSS Receiver cable, and the main transmission cable connection, they all have 2 ports need to connect, you should connect them with each other via the same port, please refer to the following diagram:
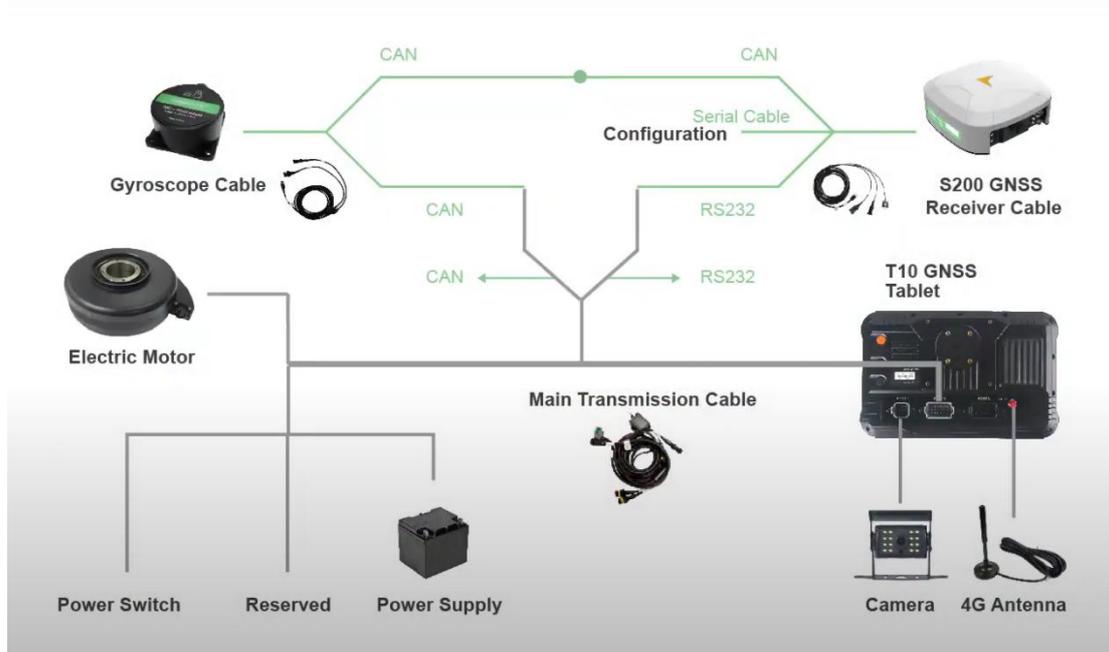
System Connection Overview

3 Configuration

Our auto-steering software is PrecisionAG, it is installed on the tablet before we send it to you.

3.1 Receiver Type

Run the PrecisionAG software, go to System> Satellite>Receiver, choose **SAgro200** as Receiver Type.
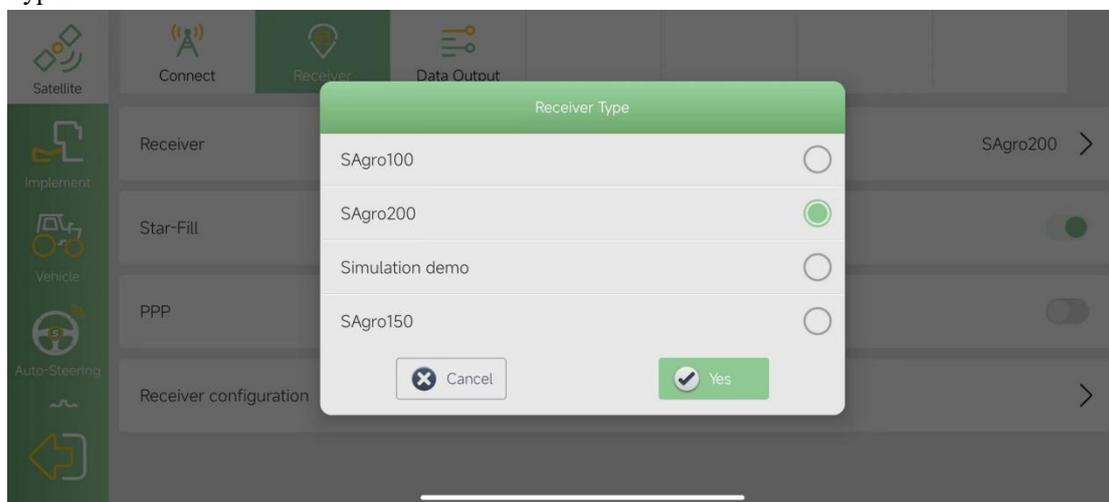
Receiver Type

3.2 Implement and Vehicle parameter

Go to Implement and Vehicle, set vehicle and farm implement parameters according to actual parameters.

3.3 Sensor Type

SAgro200 support 2 kinds of sensor: single gyro sensor and dual gyro sensor. You can choose the one you want. The single gyro sensor only uses the gyro in the S200 GNSS receiver, and the dual gyro sensor uses both the gyro of front wheel and S200 GNSS receiver.
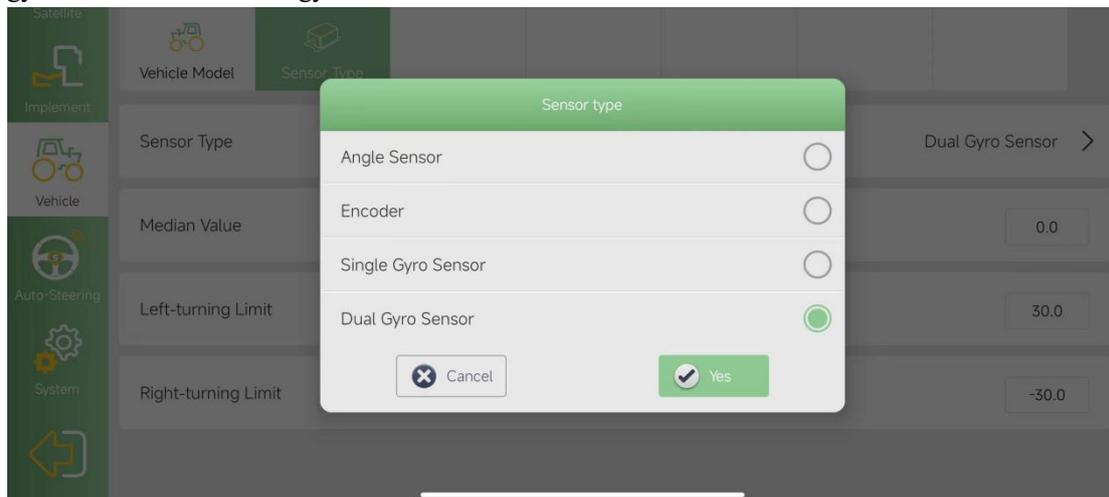
Sensor type

3.4 Base Connection

Usually we use 2 methods to connect the base: Radio or CORS.

3.4.1 CORS

First install the 4G sim card in the Tablet, and then set the correct APN so that the tablet has internet.
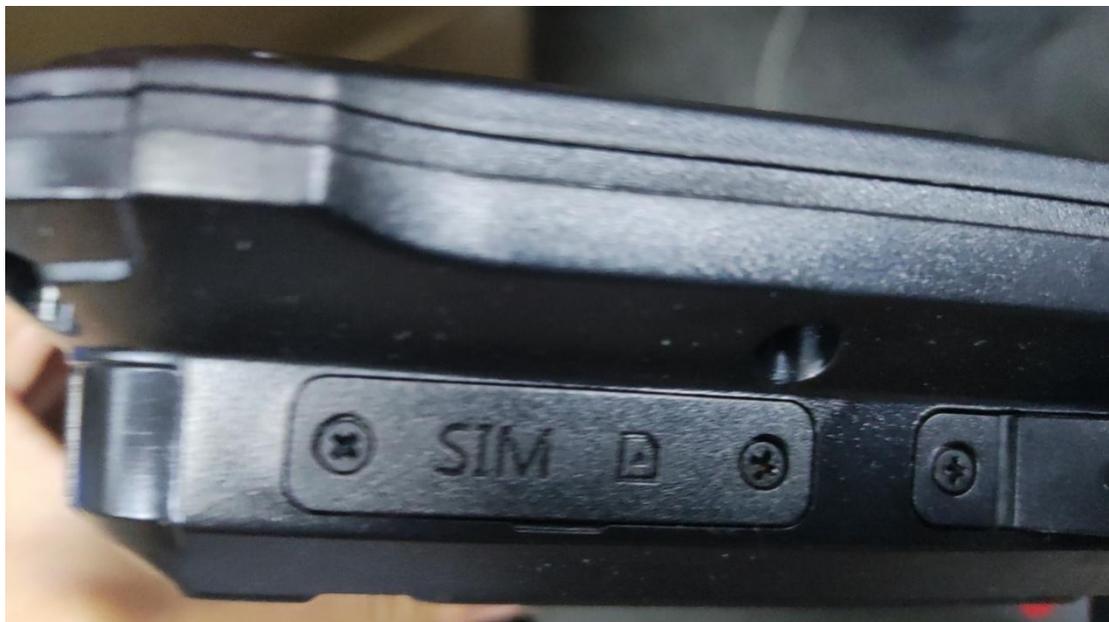
Sim Card Slot

In the PrecisionAG software>System>Satellite>Connect>CORS, set the ip, port, username, password, get and choose the mountpoint, then click Login to connect the base.
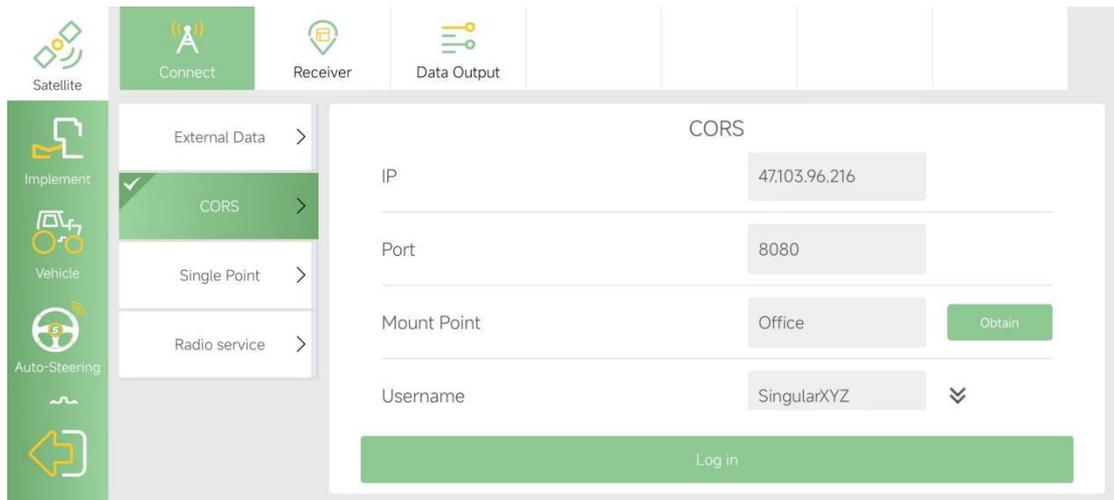
CORS Connection

3.4.2 Radio

The S200 GNSS receiver has radio inside, you should connect the radio antenna to the radio port on the S200 GNSS Receiver, and then setup the radio parameter in the PrecisionAG software.
Go to System>Satellite>Radio service. Choose the Current radio mode as Receiver built-in radio. In the radio list, choose the radio frequency same as the base so that they can connect successfully. Check the box to the right of the list to enable the setting.
Now the S200 doesn't support to change the radio protocol, the default radio protocol of the S200 is Trimtalk, please don't change the radio protocol, you can only change the frequency.
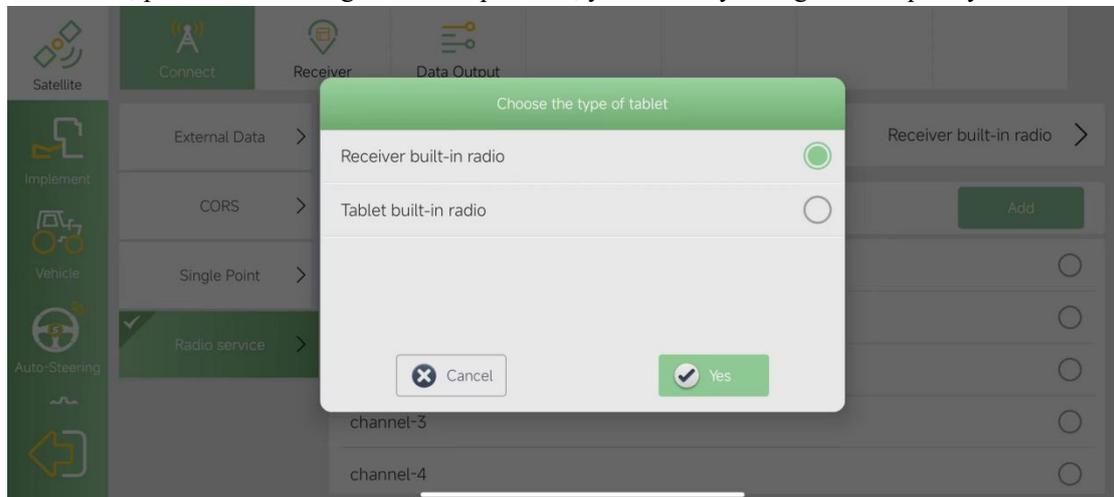
Radio mode
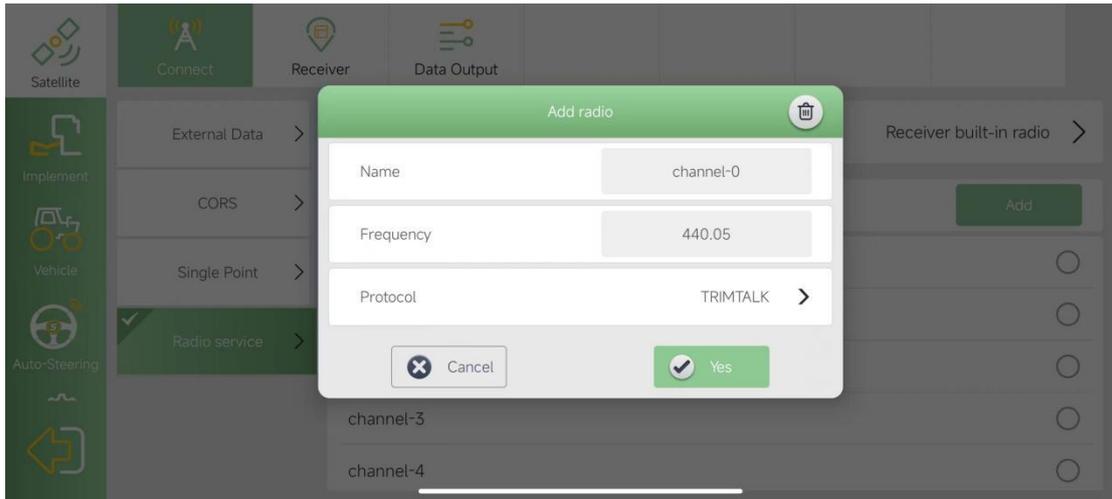
Radio parameters
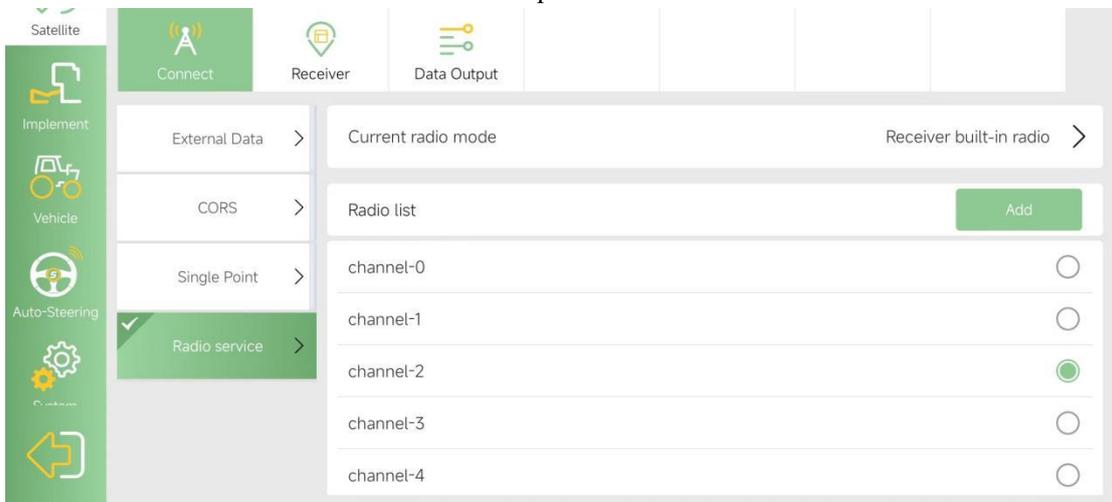
Radio setup

3.5 Vehicle debugging

The purpose of vehicle debugging is to eliminate errors caused by inaccuracies in system installation and parameter measurement. After the installation is complete, you need to do a vehicle debugging. Please click the Next button and follow the instruction to finish the vehicle debugging.

Please note: Usually you just need to do the vehicle debugging only once. But if there are accuracy problem when you are using it, you should contact with technical support to get advise, sometimes you need to do the vehicle debugging to eliminate the problem.
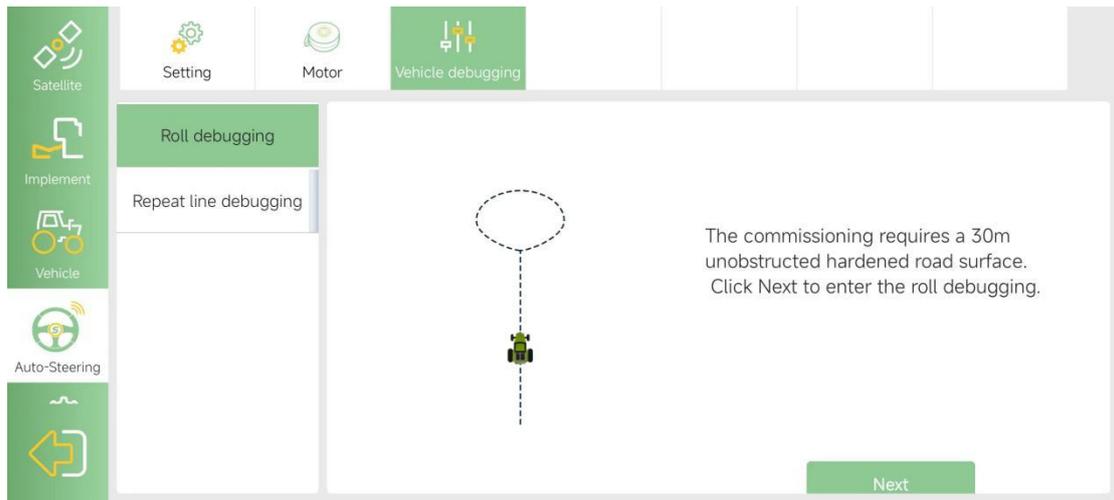
Rolling debugging
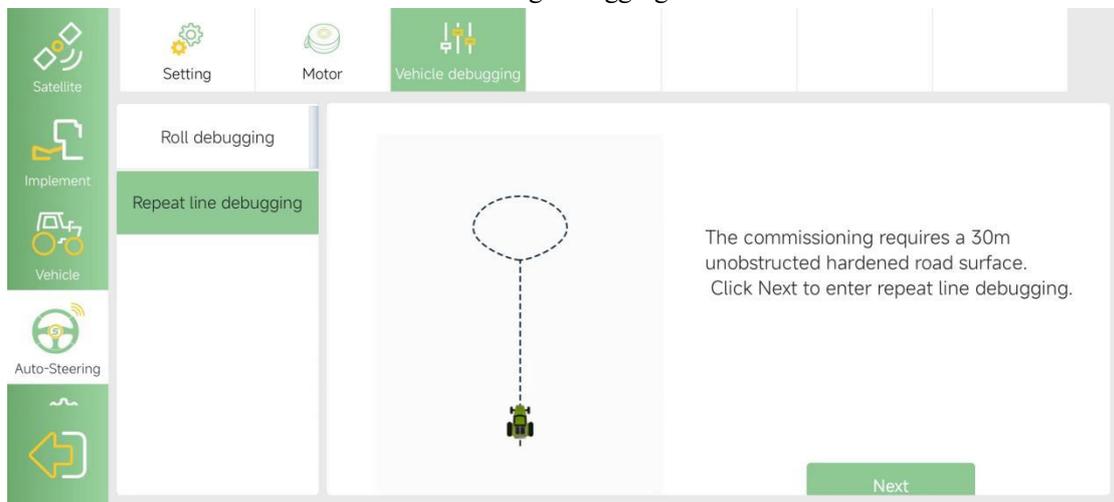
Repeat line debugging

3.6 Auto-steering parameter

Go to System>>Auto-Steering, enable the Fixed mode. For The other 2 options, lateral slope compensation and auto calibration, they don't necessarily have to be opened, we should choose based on the actual scenarios. Choose the Control mode as Mode 2.
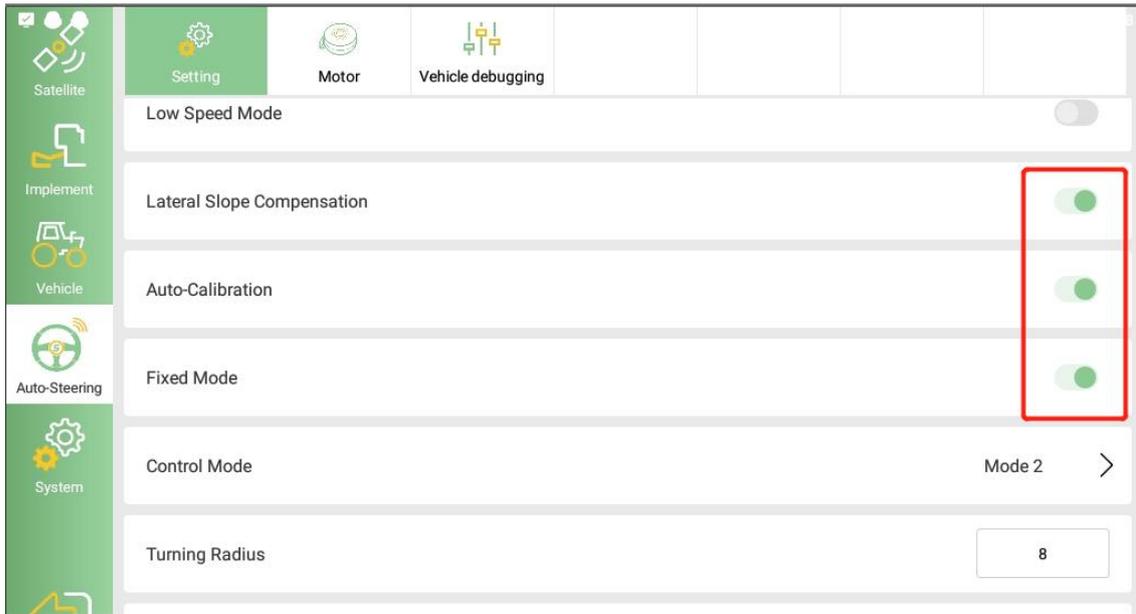
You should keep the motor setting as default, the Motor Control Mode is Speed Control, The Convert Communication is *Serial port*.

Note: Please do not change the Motor Convert communication to CAN!
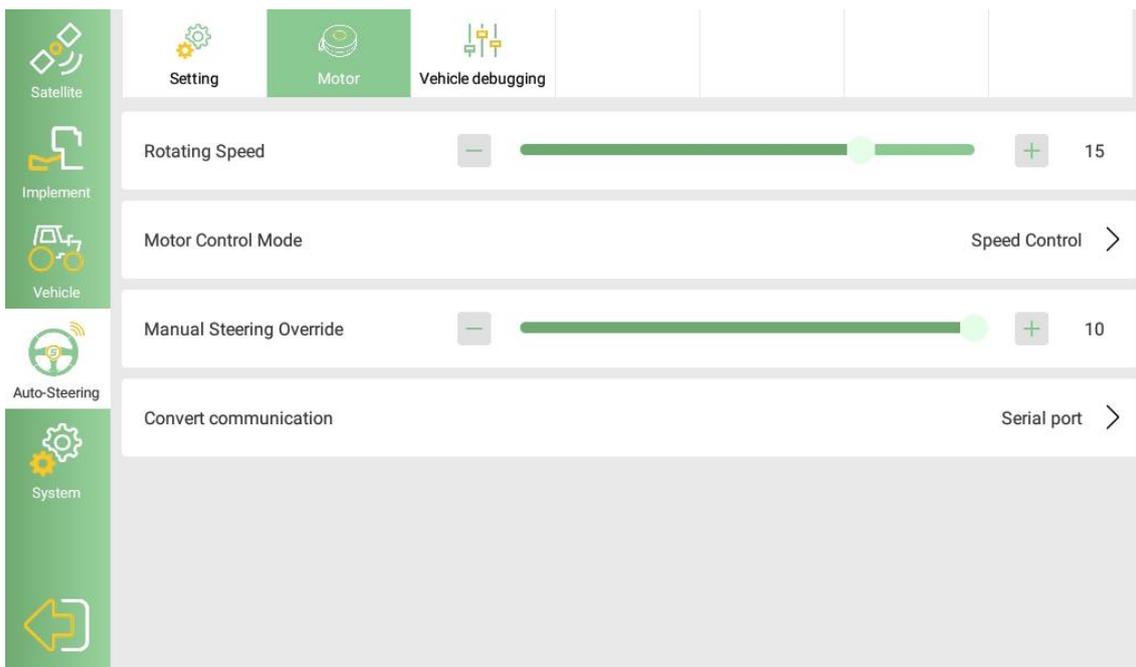
You should set the Foresight Distance based on different speeds and adjust it according to actual performance.
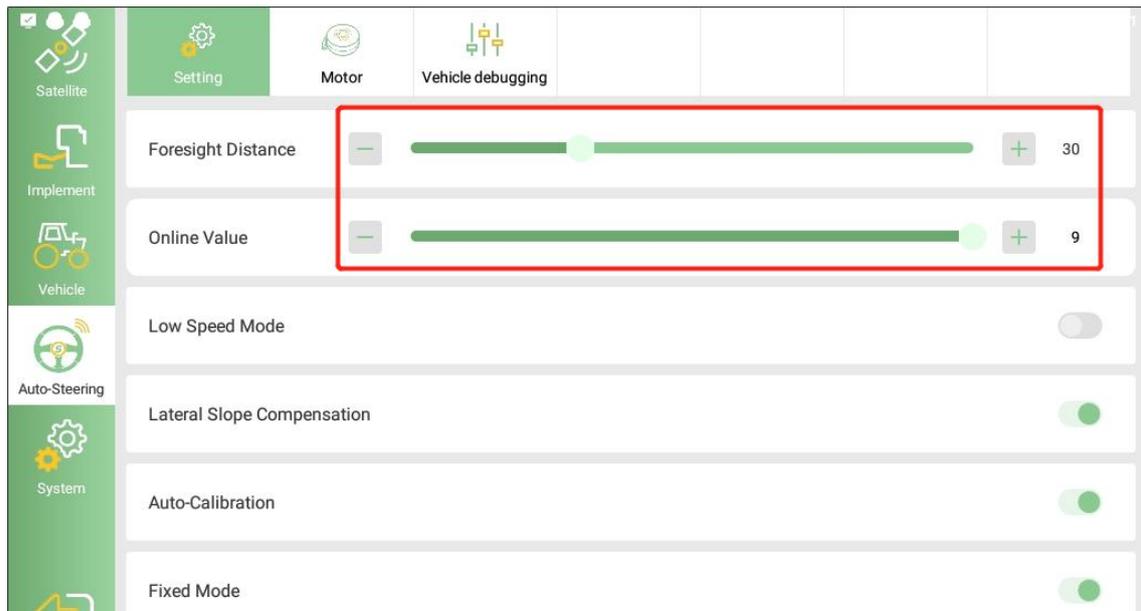
If you will use the speed as 5km/h, you need to set foresight distance around 20

If you will use the speed as 10km/h, you need to set foresight distance around 30

If you will use the speed as 15km/h or higher, you need to set foresight distance around 40 or higher

After it is set, you should do auto-steering for the first time to check the performance, if it appears small and continuous S curve, you should increase the foresight distance 5-10 at a time and drive again to check. If it is too slow to fix the deviation, you should reduce the foresight distance appropriately.

For online value, usually we use the default value.

4 Initialization.

It will prompt to ask you to calibrate the front wheel IMU sensor when you return to the main interface, the method is to *drive forward a few meters* at a low speed, it is very simple. After calibration, the prompt will disappear, you can start the auto-steering.