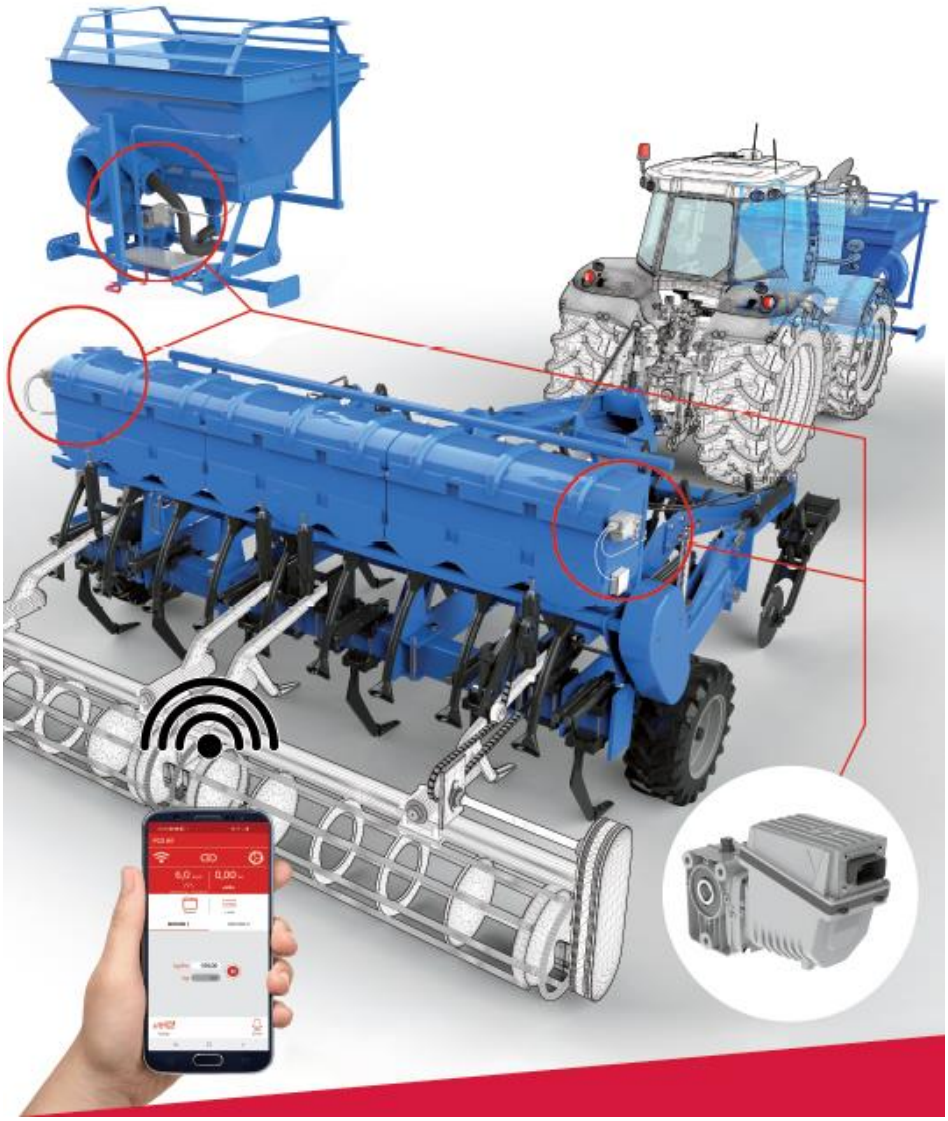

# Agri-Motion X-tend

**Installation**
**Operation**
**Maintenance**

**ORIGINAL INSTRUCTIONS**

Agri-Motion X-tend – Rev. 1.2 – March 2022


This manual is intended for users of **the Agri-Motion X-tend** kit.

ROJ reserves the right to modify at any time the content of this Manual without giving prior notice to the user.

For any technical or commercial problem, please contact your local ROJ dealer or directly call the ROJ customer service center. We will be glad to meet all your requirements.

Thanks for choosing our products.

# Agri-Motion X-tend

## INSTALLATION, USE AND MAINTENANCE MANUAL

*Edition:* *March 2022*
*Revision:* *1.2*

*Headquarters and Production plant:*

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# INDEX

**SUMMARY OF UPDATES**

| | |
|---|---|
| 9/30/2021 | Rev 1.0 |
| 12/23/2021 | Rev 1.1 |
| 03/28/2022 | Rev 1.2 |
| | |
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# INTRODUCTION

All machines [1] and equipment designed and manufactured by **ROJ** are supplied with the relative user's manuals in compliance with the Essential Health and Safety Requirements (EHSRs) 1.7.4 - *Instructions* – of Annex I to Machinery Directive 2006/42/EC.
As the prescriptions of Machinery Directive, and in particular the EHSRs of Annex 1 represent **mandatory law obligations**, during the wording of his manuals, ROJ paid particular attention to all the requirements listed in EHSR 1.7.4, in particular:

1. The **ROJ** user and maintenance manuals are supplied in the language of the machine destination country, within the European Union and, if necessary, an copy of the manual in the "original language" is also provided.
2. The **ROJ** manuals always contain a "proforma" copy of the EC Declaration of Conformity (or a "proforma" copy of the Declaration of Incorporation of the "Partly completed machinery" for the relevant machine. These copies are only meant for informative purposes, and they shall not be considered substitutive of the original Declaration of Conformity Incorporation subscribed by the supplier, and delivered separately to the Customer.
3. The **ROJ** User and Maintenance Manuals contain some information deemed as important and necessary by the Manufacturer in order to:
    - Understand the principle of operation of the machine[1].
    - Carry out the handling/mounting/installation/connection operations under **Safety Condition**s taking into account the possible hazards connected with the abovementioned activities and providing the indications, prescriptions and suggestions resulting from a careful risk assessment performed by the Manufacturer following the principles of the EN ISO 12100:2010 Type A Harmonized Standard, the EN ISO 4254-9:2018 Type C Harmonized Standard and the ISO/TR 14121-2:2013 Guidance to Risk Assessment.
    - Correctly use the machine (control devices, safety and emergency devices, operating procedures, etc.) under **Safety Conditions**, drawing the operator's attention possible "Residual Risks", i.e. the risks that remain notwithstanding all the safety measures adopted after performing the risk assessment, as indicated in the previous point.
    - Carry out the ordinary/preventive maintenance operations on the machine [1] under **Safety Conditions**, drawing even in this case the maintenance technician's attention to the possible Residual Risks.
4. The ROJ User and Maintenance Manuals describe not only the intended uses of the machine [1], but also the reasonably expected misuses, according to the experience accrued by the Manufacturer.

## SAFETY

In relation to the risk analysis and assessment activities carried out in accordance with the principles of the EN 12100: 2010 Harmonized Standard (as described in 3 above), the seeder manufacturer or the system integrator selects the various components of the safety related control systems (e.g. micro-switches on the guards of the seeding elements), in a way as to ensure a reliability level suitable to the actual severity of the hazard (typically Performance Level “c”). To this purpose we have followed the requirements of the EN ISO 13849-1:2015 Harmonized Standard.

The **ROJ** Agri-Motion X-Tend system complies with the Immunity and Electromagnetic Radiation Limits defined by the Harmonized Standard for agricultural and forestry machinery EN ISO 14982:2009.

The **ROJ** User and Maintenance Manuals contain the updated list of the harmonized standards applied during the design phase in order to guarantee the compliance with the Essential Safety Requirement Listed on Annex I of 2006/42/EC Directive, while the design and implementation details are described on the Technical Documentation kept by the manufacturer according to the prescriptions of Machinery Directive 2006/42/EC.

*(1) The term "Machine" used within this manual refers generically to the definition given in 2006/42/EC Directive and thus combines both complete machines able to carry out a well-defined function and "Partly completed machinery" or equipment or drive systems not able to perform a defined function as they are intended to be incorporated in a complete Machine.*

## CE IDENTIFICATION PLATE

The Agri-Motion X-tend kit is CE marked on the back side of the access point.
The CE marking refers to the whole Agri-Motion X-tend kit.

## COMPLIANCE WITH THE EUROPEAN DIRECTIVES AND REGULATIONS

Herein under is a summary of the Declaration of Incorporation, drawn up in accordance with the requirements of Annex II B to the 2006/42/EC Directive, where **ROJ** declares that the following "Partly completed machinery":

| | |
|---|---|
| ***Type:*** | Agri-Motion X-tend |
| ***Construction Year:*** | *See Official Declaration of Incorporation* |
| ***Serial Number:*** | *See Official Declaration of Incorporation* |
| ***Target use:*** | *Servo-assisted power supply for seeders* |

**cannot** be commissioned unless the compliance of the agricultural machinery on which it has to be incorporated with the requirements of the 2006/42 /EC Directive - Annex II A - related to the machine safety is ensured by the Manufacturer of the agricultural machinery or the system integrator and that for its design and manufacturing the principles and concepts introduced by the applicable paragraphs of the following Harmonized Standards have been adopted:

- EN ISO 12100:2010
- EN ISO 13849-1:2015
- EN ISO 13849-2:2012
- EN ISO 4254-1:2015
- EN ISO 4254-9:2018
- EN ISO 14982:2009

The Agri-Motion X-tend kit complies with the requirements of the following additional directives:
EMC 2014/30/EU Directive relating to Electromagnetic Compatibility.
RED 2014/53/EU Directive relating to Radio Equipment
RoHS III Directive (2011/65/EU and Delegated Directive 2015/863/EU)

The technical documentation is kept at the ROJ Technical Departments (mechatronics@roj.com).

**ROJ** has complied with the following EHSRs (Essential Health and Safety Requirements) Annex 1 to the Machinery Directive 2006/42/CE:

1.1.1 – 1.1.2 – 1.1.3 – 1.3.2 – 1.3.4 – 1.3.7 – 1.3.8 – 1.5.5 – 1.5.10 – 1.5.11 – 1.6.1 – 1.7.1 – 1.7.2 – 1.7.3 – 1.7.4

The manufacturer of the agricultural machinery or the system integrator must ensure compliance to all the applicable EHSRs not mentioned in the above list.

ROJ agrees to send all the relevant information about the Agri-Motion X-tend partly completed machinery via email or FTP, upon reasonable request made by the relevant national authorities.

*The above information is merely indicative and shall not be considered as replacing the original Declaration of Incorporation signed and released by the Manufacturer.*

## WARRANTY AND RESPONSIBILITY OF THE MANUFACTURER

The **Agri-Motion X-tend** kit described in this manual is designed to be incorporated into agricultural machines and it's therefore intended to work exclusively in combination with the above machines.

The various components of the kit can be installed on the seeder by:

- the seeder manufacturer
- **ROJ** specialized and authorized technicians

The testing and commissioning of the system is in any case entrusted to specialized personnel.

**ROJ** declines any responsibility in case of improper installation of the system without following the instructions given in this manual or if the system is commissioned without a prior authorization by **ROJ**.

The end user must ensure that the equipment is used in accordance with the laws and regulations in force in the country of installation, in particular as far as the workers safety is concerned, and more generally in relation to the health, safety and accident prevention requirements.

Any complaint must be promptly submitted upon detection of any defect attributable to the **Agri-Motion X-tend** kit components.

If, after an accurate assessment, the complaint is deemed as admissible**, ROJ** may, at its sole discretion, replace or repair the defective components.

## OTHER WARRANTY TERMS

**ROJ** warrants the quality and reliability of the equipment that has been designed and manufactured to provide optimal performance.

The warranty does not cover any damages or indirect costs due to machine downtime or irregular operation caused by improper use of the equipment or of individual **ROJ** devices.

It is the responsibility of the end user to periodically perform cleaning and ordinary preventive maintenance activities, aimed at keeping the equipment operation within the expected performance range.

Any failure to the equipment due to improper connection will void the warranty.

The warranty does not apply in case of floods, fire, electrostatic/inductive discharges or in case of discharges caused by lightning or other phenomena external to the **ROJ** equipment.

The warranty does not cover any damages to operators or other equipment /devices connected to the **ROJ** equipment.

The customer is fully responsible for the proper use and maintenance of the equipment, according to the instructions given in this operating manual.

This warranty does not cover parts subject to normal wear.
**Any other warranty form is excluded.**

# 1. GENERAL INFORMATION

## 1.1. INTRODUCTION

### 1.1.1. The ideal solution to control and optimize the distributor

The Agri-Motion X-tend kit is designed to be installed on agricultural machines, such as hoppers and seed metering devices in order to control and optimize the distribution process.
Thanks to its exclusive configurability and ease of use the Agri-Motion X-tend kit is the ideal solution to motorize fertilizer spreaders, allowing them to be directly controlled from the tractor cabin.

### 1.1.2. Purposes of this manual

This manual aims at providing the Agri-Motion X-tend kit users with the essential information necessary to:

- install and properly connect the system components under safe conditions.
- configure the system and set up the various operating parameters according to the user's requirements.
- carry out the preventive maintenance on the system under safe conditions.

### 1.1.3. How to Use this Manual

The manual is divided into 4 sections:
**Section 1** It shows the layout and the components of the system and provides notes and safety warnings, in addition to the technical data of the units included in the kit.
**Section 2** – It describes the operations and procedures required for a correct installation and commissioning of the system.
**Section 3** – It describes the machine operator interface, the configuration modes, the parameters setting and the relevant information for a correct interpretation of alarm and faults messages.
**Section 4** – It contains the information and warnings necessary for the proper maintenance of the system.

### 1.1.4. Symbols used

*This symbol highlights the notes, warnings, and points the reader's attention has to be drawn on.*

***This symbol indicates a particularly delicate situation that could affect the safety or proper functioning of the system.***

*This symbol indicates the obligation to dispose of a material having an impact on the environment in accordance with the local regulations.*

*This symbol indicates the tasks that can be performed through a simple but essential visual inspection.*

### 1.1.5. Environment protection

**Handling of electrical or electronic equipment at the end of the life cycle (Applicable to all countries of the European Union and to those countries where a separate collection of waste is in force).**
This symbol on the product or its packaging indicates that the product should not be treated as a normal household waste, but it must be handed over to an appropriate collection point for the recycling of electrical and electronic equipment. Making sure that that this product is properly disposed of, you will help prevent potentially negative effects on the environment and on human health, which otherwise could be caused by an inappropriate disposal of the same. Proper recycling of the materials will help to protect natural resources. For more details about the recycling procedures for this product, you may contact your municipal technical office, your local waste disposal service or your local dealer.

*Always recycle worn batteries into special containers.*

*DO NOT DISPOSE OF BATTERIES IN THE OPEN ENVIRONMENT*

## 1.2. GENERAL INFORMATION AND PERFORMANCES

### 1.2.1. Introduction

The Agri-Motion X-tend kit is designed to be applied to agricultural machineries such as simple hoppers of fertilizer spreaders or grain metering devices, in order to replace the mechanical transmission that drives the metering units with electrical motors, that can be controlled by a smartphone or a tablet.
The basic functions of the system can be summarized as follows:

- **Speed control of the fertilizer and micro-granular fertilizer spreader** in order to distribute a certain quantity of seeds per/ha of sown field
- **Hectare counter** to track the work area
- **Distributor quantity estimation**

### 1.2.2. Functional blocks

The system consists of the following functional blocks (Picture 1-1):

- **DMD**: Geared motor with integrated drive, used for driving the fertilizer and micro-granular fertilizer spreader.
- **AP**: Wi-Fi Access Point Module which allows the connection to the system with a smartphone/tablet, creating a dedicated Wi-Fi network.
- **Cabling**: for the connection of the different devices and for the power supply through the ISO-12369 tractor plug.

It must be integrated by one of the following options:

- **Option 1:**
  - **Machine position sensor**, to determine whether the seeder is lifted (transport/taxing position) or lowered (seeding position).
  - **Speed sensor**: wheel sensor that generates an incremental position reference (or speed) of the tractor.

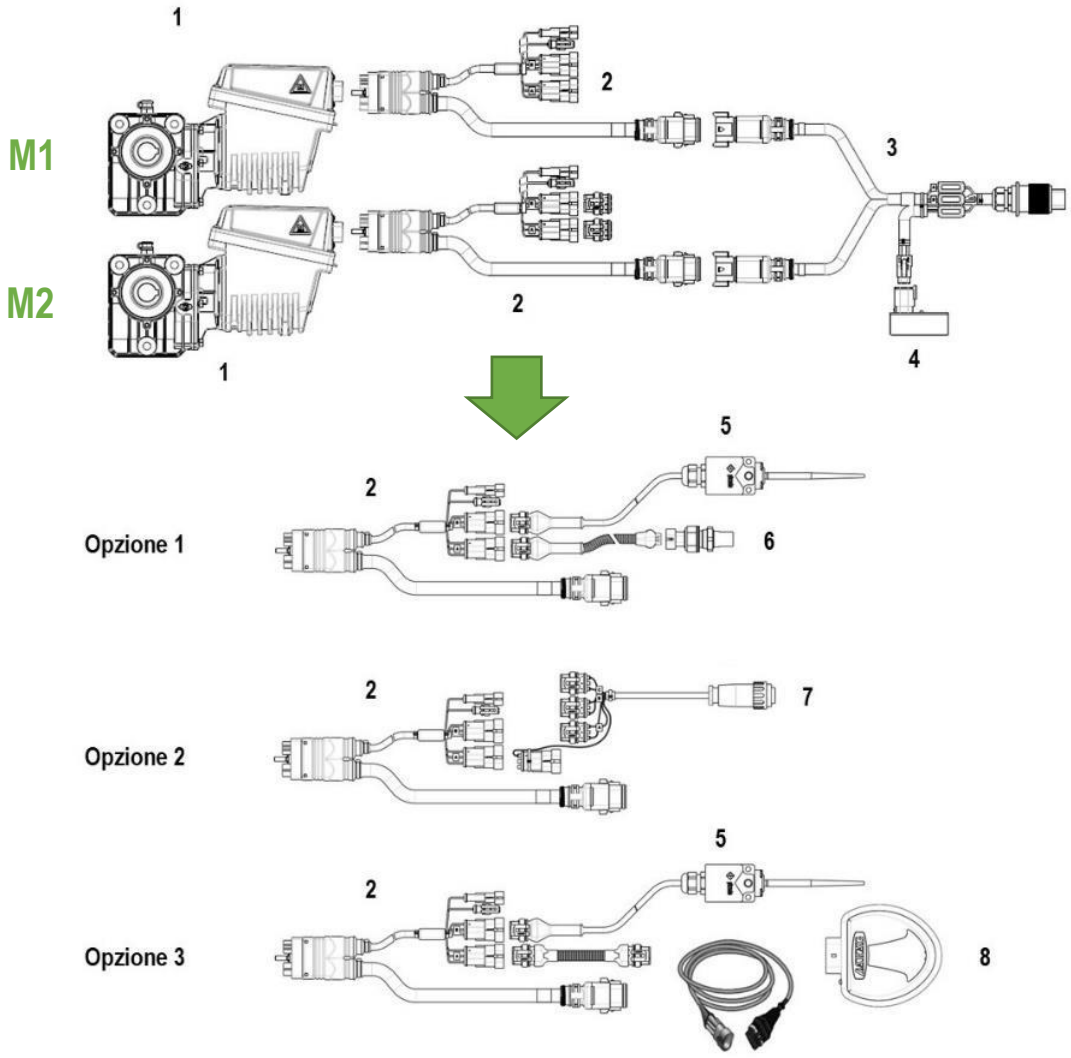
- **Option 2:**
  - **ISO-11786 cable:** to receive the machine speed and position information from the ISO-11786 tractor plug.

- **Option 3:**
  - **Machine position sensor**, to determine whether the seeder is lifted (transport/taxing position) or lowered (seeding position).
  - **GPS (optional):** to receive the advancement information from the device.

### 1.2.3. Acronyms used

**EHSRs** Essential Health and Safety Requirements. Annex 1 of the Machinery Directive.
**PL** Performance Level (reliability of safety-related parts) according to UNI EN ISO 13849- 1
**CAN** Controller Area Network (BUS)
**AP** Access point
**DMD** Motor with integrated drive

## 1.3. COMPONENTS OF THE AGRI-MOTION X-TEND KIT




**Picture 1-1 Main components of the Agri-Motion X-tend kit**

## TECHNICAL DATA

| | | |
|---|---|---|
| **1** | **DMD0 motor** | Rated voltage: 12 VDC; Rated current: 6.6 A; Rated power: 80 W<br>Rated speed: 100 rpm |
| **2** | **X-tend DMD cable** | Cabling for the connection of the different devices |
| **3** | **ISO12369 cable X-tend** | Cabling for the power supply through the ISO-12369 tractor plug. |
| **4** | **X-tend AP** | Rugged access point module<br>Rated voltage: 12- 12 VDC; Rated current: 250 mA |
| **5** | **Machine position** | Machine position sensor (tool switch) |
| **6** | **Speed sensor** | Hall effect speed wheel sensor |
| **7** | **ISO-11786 cable** | This cable can be used to receive the information related to speed and hitch position directly from the tractor |
| **8** | **GPS** | GPS device and with cables |

*The components from 5 to 8 in the three connection options are not included in the Agri-Motion X-tend base kit.*

## 1.4. GENERAL SAFETY INFORMATION

### 1.4.1. Design criteria

The principles introduced by the relevant paragraphs of the following Harmonized Standards have been adopted in the design and manufacturing of the **Agri-Motion X-tend** kit or have been used as reference for it:

| **Standards applied for the design of the DMD0 geared motor** | |
|---|---|
| **EN ISO12100:2010** | *Safety of machinery. General principles for design. Risk assessment and risk reduction.* |
| **EN ISO 14982: 2009** | *Agricultural and forestry machinery - Electromagnetic compatibility - Test methods and acceptance criteria.* |
| **Rules applied for the design of the X-tend AP Access Point Module** | |
| **EN 62368-1:2014+A11:2017** | *Audio/video, information and communication technology equipment – part 1: Safety requirements.* |
| **EN 50383:2010** | *Basic standard for the calculation and measurement of electromagnetic field strength and SAR related to human exposure from radio base stations and fixed terminal stations for wireless telecommunication systems (110 MHz - 40 GHz)".* |
| **ETSI EN 301 489-1 V2.2.3:2019** | *Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.* |
| **ETSI EN 301 489-17 V3.2.4:2020** | *Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems.* |
| **ETSI EN 300 328 V2.2.2:2019** | *Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band.* |
| **EN 62311:2008** | *Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz).* |
| **Applied standards for the design of the whole Agri-Motion X-Tend partly completed machinery** | |
| **EN ISO 12100: 2010** | *Safety of machinery - General principles for design - Risk assessment and risk reduction.* |
| **EN ISO 4254-1:2015** | *Agricultural machinery - Safety - Part 1: General requirements.* |
| **EN ISO 4254- 9:2018** | *Agricultural machinery - Safety - Seed drills.* |
| **EN ISO 13849-1:2015 (*)** | *Safety of machinery. Safety-related parts of control systems. Part 1: General principles for design.* |
| **EN ISO 13849-2:2012** | *Safety of machinery - Safety-related parts of control systems. Part 2: Validation.* |
| **EN 50581:2012** | *Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.* |

(*) Only applied to the Performance Level Assessment of the safety function on movable guards (responsibility of the seeder manufacturer).

The compliance with the relevant paragraphs of the above Harmonized Standards allowed us to eliminate or reduce as far as possible the risks, both during normal operation and during the adjustment and / or maintenance operations on the equipment, along its whole life cycle.
All components have been carefully selected among those available on the market, and the materials used in manufacturing the system present no risk to people's health and safety.
Safety measures have also been implemented for the **Agri-Motion X-tend kit** in order to eliminate or reduce the residual risks within acceptable limits *(see paragraph "Warning about residual risks").*
In particular, the Essential Health and Safety Requirements of Annex I to Directive 2006/42/EC listed in the Incorporation Declaration have been complied with.
The compliance with the non-listed requirements must be granted by the Seeder Manufacturer of the system integrator and should be verified during the commissioning of the Agri-Motion X-tend kit.

### 1.4.2. Safety Devices and Solutions

All moving parts of the geared motors are properly protected to prevent mechanical dangers and the electrical parts of the actuator are enclosed in a housing with a minimum IP66 protection rating.
The installation of a safety device (electromechanical micro-switch or electromagnetic sensor) on the guards of seeding elements should be foreseen (by the seeder manufacturer or by the system integrator) which prevents from starting the geared motor under open guard conditions.
This safety measure is not foreseen for the fertilizers and micro-granular fertilizer distribution units, since the guard open condition does not involve the exposure to hazards for the operator.

***The components of the integrated drive inside the geared motor can only be accessed using suitable tools and exclusively by skilled and authorized staff, when the machine is in stationary position and disconnected from any power source.***
***Any attempt to remove or by-pass the safety measures installed, thus reducing the overall safety level, IS STRICTLY FORBIDDEN.***
***The user shall be fully liable for any damage to objects or persons arising from the non-observance of the recommendations herein mentioned.***

### 1.4.3. Warning about Residual Risks

Notwithstanding all the safety measures taken and listed in the previous paragraph, some risks remain during installation, use and maintenance due to:

- the presence of electricity even with the agricultural machine at standstill
- the presence of potential high temperatures in the geared motors groups

In these phases it is therefore necessary to work with the utmost care following the instructions given by the manufacturer of the agricultural machine or by the system integrator, in order to avoid any dangerous situations.
The presence of these residual risks is indicated by special warning labels attached to the housings of the geared motor built-in drives.

It indicates the need to pay due attention in order to avoid the risk of burns.

### 1.4.4. Warnings and Rules of Behaviour for the Operator

To avoid any dangerous conditions for the operator or damages to equipment, we advise you to scrupulously follow the warnings and the rules of behaviour listed below.

***ROJ** shall not be held responsible for any damage to objects and / or people occurring as a result of your failure to follow those warnings.*

- Operators shall be properly trained to make best use of the equipment safely, and must have read and understood the instructions and warnings given in this manual.
- Personnel performing installation and maintenance on the machine must read this manual before performing any electrical or mechanical intervention.
- All personnel operating on the system must wear appropriate clothing, avoiding or paying due attention in case of:
    - fluttering clothes

  - necklaces, bracelets and rings
  - wide sleeves
  - long hair
  - dangling ties or scarves
- Before using the machine equipped with the Agri-Motion X-tend kit ensure that any threat to personal safety has been appropriately eliminated, that all guards or other protective devices are properly installed and all safety devices are efficient.
- Do not start the machine if anomalies have been detected.

***DO NOT attempt to remove or by-pass any the safety measures: doing so will reduce the safety level of the system.***

***DO NOT perform any type of work with the machine powered up.***

*At the end of every maintenance work, ensure that no used tool remained near the geared motors.*

*Prior to the machine startup, restore and always check the correct functioning of the safety devices, if they have been de-activated during the operation.*

***After any operation on the equipment all materials having an impact on the environment (such as, for example, electrical cables, components, etc.) must be properly disposed of in accordance with the applicable regulations.***

### 1.4.5. Noise level emitted

The Agri-Motion X-tend kit has been designed and manufactured in a way as to minimize the noise level emitted during its normal operation.
In any case, since the only sources of potential noise generated by the Agri-Motion X-tend kit (*geared motors*) are of negligible magnitude (<70 dBA) as compared to the noise produced by the agricultural machine as a whole, it is the responsibility of the machine manufacturer and/or end user to determine the weighted sound pressure level generated by the whole machine.

### 1.4.6. Information related to radio frequency

The Agri-Motion X-tend kit includes a CAN-to-Wi-Fi wireless module called X-tend AP (P/N ROJ 54T00991R). This is a radio device with the following characteristics:

- Communication protocol: 802.11b, 802.11g, 802.11n (Wi-Fi)
- Operating Band: 2.412 – 2.472 GHz
- RF Power: 17 dBm

### 1.4.7. Proper and Improper Use

The Agri-Motion X-tend kit is designed to be incorporated into seeders and fertilizer hoppers or equivalent applications. The use of the- X-tend kit for different purposes may result in damages to People or to the equipment itself and is therefore considered as an **Improper use** which the Manufacturer is not held responsible for.

### 1.4.8. Reliability and safety of control systems

In the Agri-Motion X-tend kit, the safety-related control systems should be designed (*by the seeder manufacturer or the system integrator)* in accordance with the principles of Harmonized Standard EN ISO 13849-1:2015. The Category and implemented Performance Level (PL) values (*as compared to the Required Performance Level (PLr) deriving from the Risk assessment)* should be as follows:

| Safety function | Category | PLr | PL |
|---|---|---|---|
| Inhibition of hazardous movements in case of open guard of the metering unit | ≥1 | c | c |

The PLr has been calculated using the "SISTEMA" (IFA) software.
The calculation of the implemented PL shall be carried out and recorded by the seeder manufacturer of the system integrator.

For more information, see chapter 2.6.2

# 2. INSTALLATION

## 2.1. GEARED MOTOR (DMD0) FEATURES

For further information please refer to the following attached documents:

- *TD_1406.601_revH.pdf or later revision.*
- *1061_hard.pdf*
- *1061-cid-a.pdf*
- *1061_angle.pdf*

### 2.1.1. Outlet shaft torque and speed

The following features refer to the geared motor outlet shaft (slow shaft) variables.

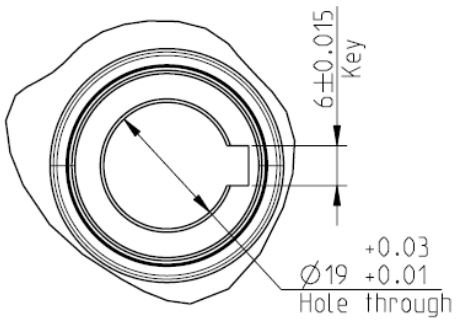
| | |
|---|---|
| Nominal torque | 8.75Nm |
| Peak torque | 19Nm (single pulse, duration 500ms)<br>12Nm (repeated, duration 500ms, every 5 seconds) |
| Nominal speed | 100 rpm |

The torque and speed of the application must comply with the above requirements.

For more information, please refer to *TD_1406.601_revH.pdf* or later revision.

### 2.1.2. Outlet shaft dimensions

At the geared motor outlet, a hollow shaft is installed having the following dimensions.




**Picture 2-1 Outlet shaft dimensions**

For further information, please refer to *1061-cid-a.pdf.*

### 2.1.3. Fastening flange characteristics

Please refer to *1061-cid-a.pdf.*

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## 2.2. GEARED MOTOR (DMD0) INSTALLATION

### 2.2.1. General principles

The fastening of motors to the machine, whether they are used for the seeding disc shaft or the fertilizer or micro-granular fertilizer spreader shaft rotation, must be carried out in a way as to ensure a perfectly aligned coupling between the disc/distributor shaft and the reducer outlet hollow shaft.

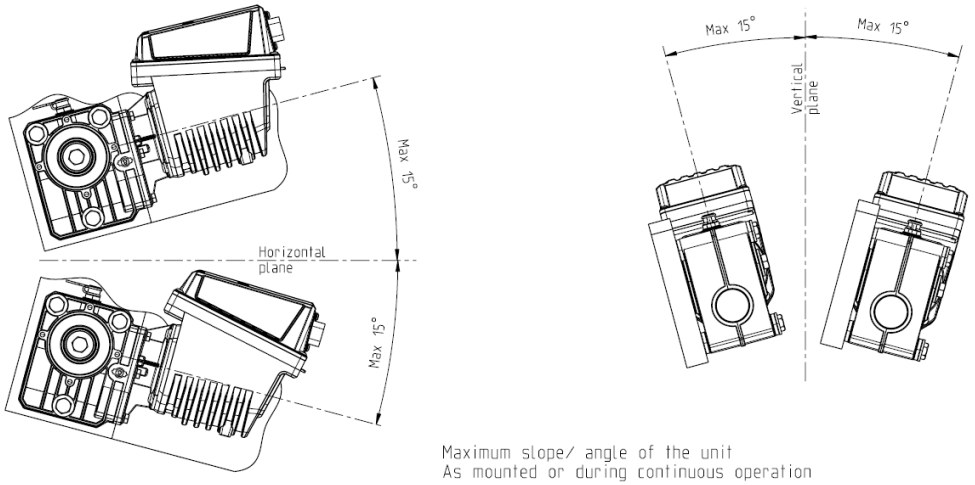
***If the alignment is not perfect, radial forces may occur on the bearings, causing a consequent torque increase and a reduction of the device lifetime.***

***In order to reduce bearings stresses, a flexible joint can be used. The flexible joint is not supplied with the motor kit and must be chosen and sized according to the application.***

### 2.2.2. Limits for the mounting angle

The gearbox axis must run parallel to the horizontal plane.

In order to grant a suitable lubrication of the reduction phase, it is necessary not to exceed the maximum tilting grade as indicated below.

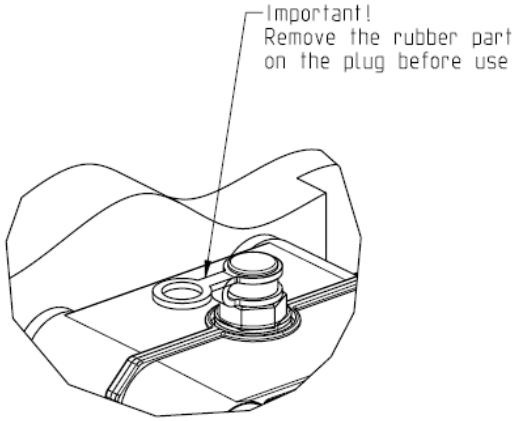



**Picture 2-2 Limits for the mounting angle**

For more information, please refer to *1061-angle.pdf*

### 2.2.3. Transport cap

The geared motor is delivered with the rubber part of the oil filling cap positioned in its seat, in order to avoid lubricant leakages during transport. This part is exclusively mounted for transport purposes and should be removed before the installation.

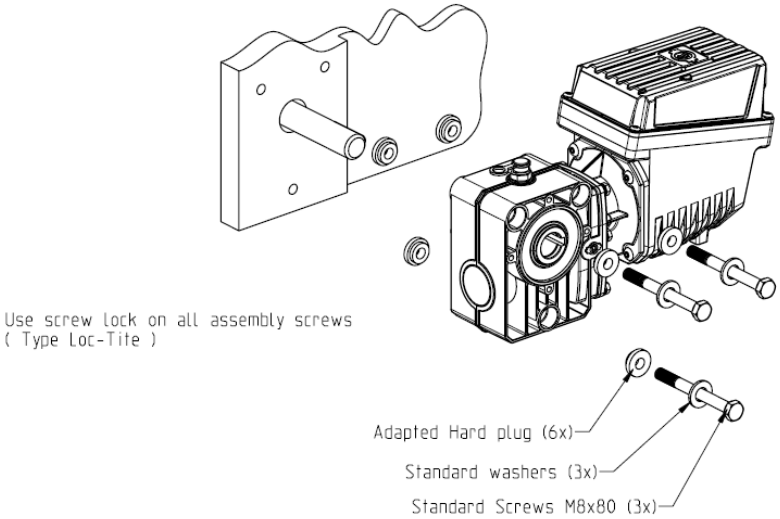



**Picture 2-3 Cap with vent**

### 2.2.4. Fastening

For a correct fastening of the geared motors 6 special aluminium bushings have been provided.
Screw the geared motor to the flange using the bushings, the M8x80 bolts and standard M8 washers, as illustrated in the Picture 2-4.
We suggest locking the bolts with a thread-lock product.

Tightening torque: 10 Nm.



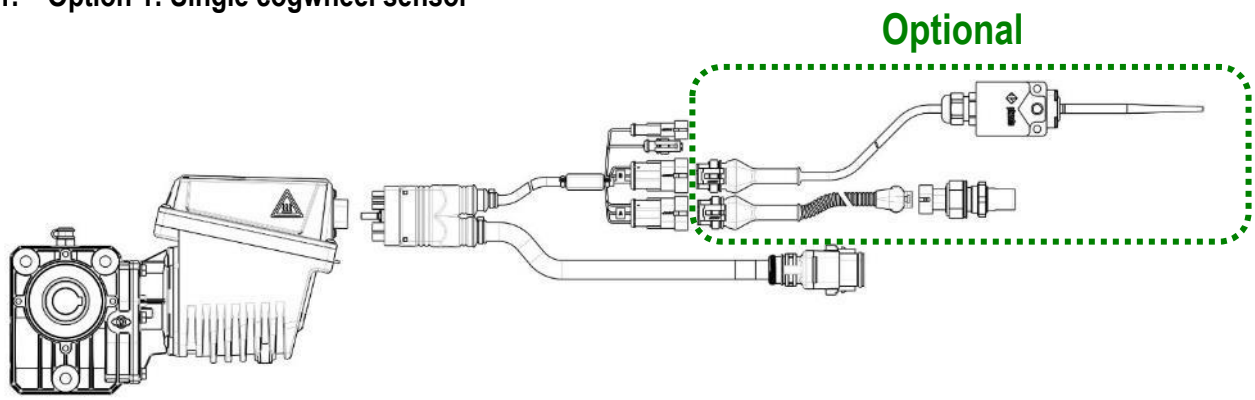

**Picture 2-4 Details of the motor fastening**

## 2.3. ADVANCEMENT SPEED

The Agri-Motion X-tend kit allows three different connection options in order to obtain information about the advancement speed.

***WARNING: For a proper operation of the system, the following devices must be connected to the motor that has been identified as motor 1 during the addressing phase.***

### 2.3.1. Option 1: Single cogwheel sensor



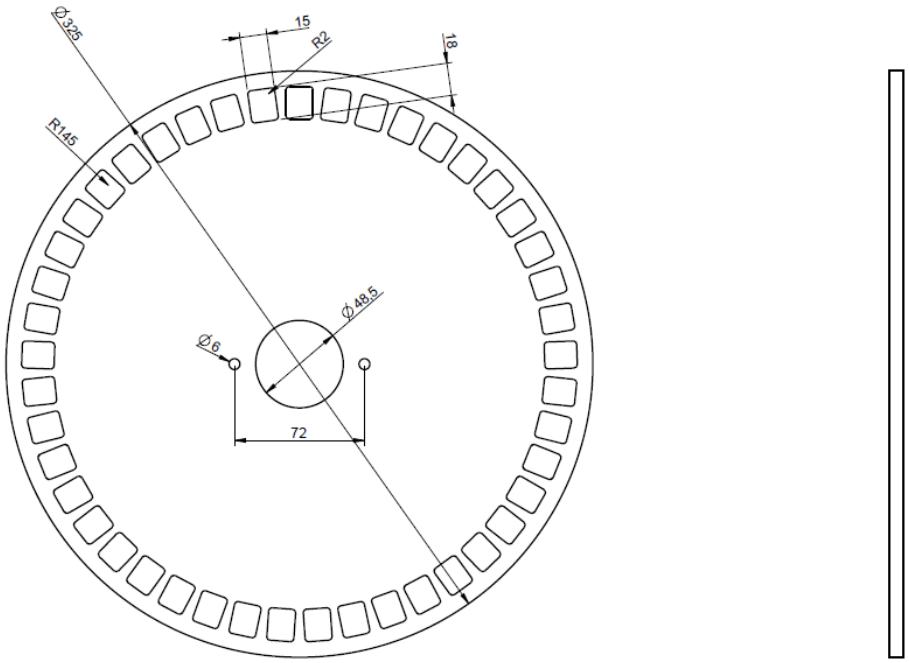

**Picture 2-5 Speed sensor connection option**

A **Hall effect speed sensor** type Cherry GS102301 (P/N ROJ 50A00174R) with cable (P/N ROJ 05R01400) is used to detect the speed of a phonic wheel connected to the drive wheel of the machine.
The sensor must be connected to the DMD X-tend cabling connector indicated by SPEED_IN.

**Picture 2-6 Speed sensor with cable**

The phonic wheel **is not provided** in the kit, because the maximum dimensions, the number and shape of the teeth and the connection to the wheel depend on the type of machine and on the available installation space.

Picture 2-7 represents an example of phonic wheel used for the suggested sensor.




**Picture 2-7 – Example of phonic wheel for speed sensor**

The phonic wheel should be directly fixed to the seeder drive wheel, in order to avoid rack and pinion transmissions.

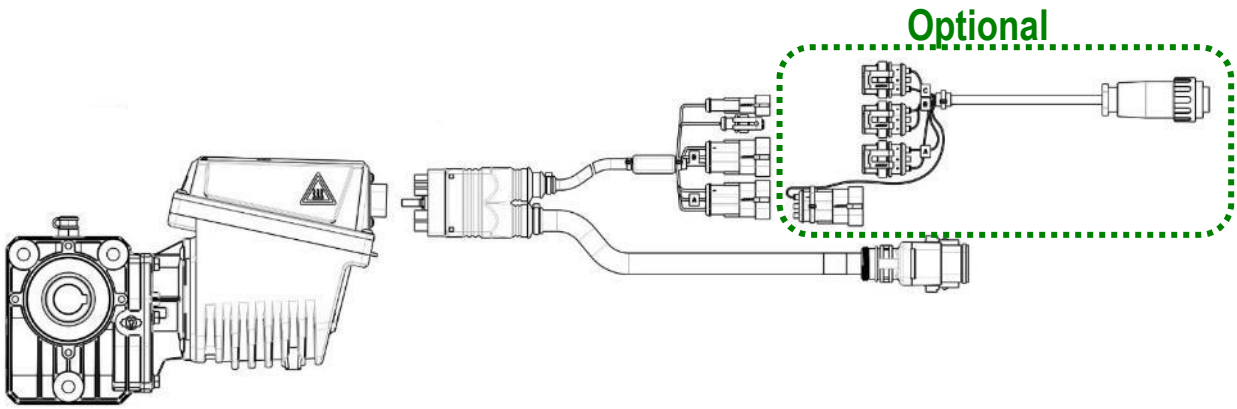
During the installation stage, correctly adjust the sensor/teeth distance, in a way as to guarantee the correct count.

The steps mentioned in the following section can be followed to check the proper operation of the sensor while checking the machine overall operation.

We know from our experience that minimum number of teeth of the phonic wheel is 25.

For example:
Considering a tractor wheel with a diameter of 64 cm and 25 pulses per revolution of the sensor wheel, 1200 pulses are approximately generated in a distance of 100 meters. This could be a good resolution.

### 2.3.2. Option 2: ISO plug connection

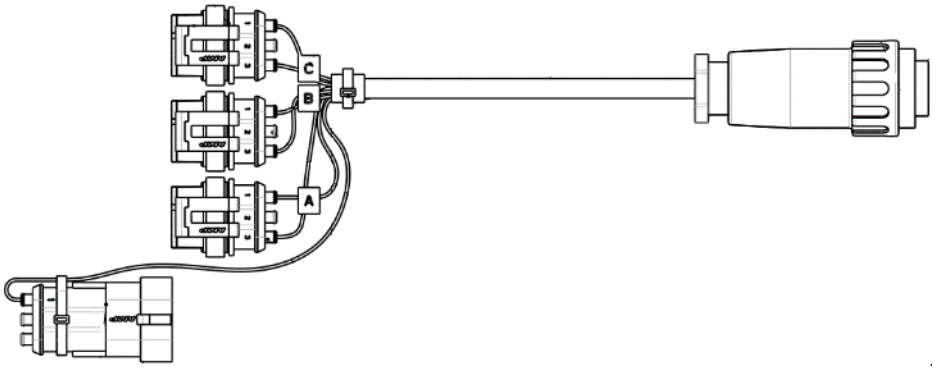



**Picture 2-8 ISO11786 plug connection option**

A special cable (P/N ROJ 05R01423) is used which allows the direct connection to the ISO11786 tractor plug.

Thanks to this connection three different signals can be generated by the tractor:

- SPEED_RADAR (A): RADAR on the tractor or RADAR emulation from the GPS.
- SPEED_IN (B): Speed from tractor transmission.
- PROX_MACHINE (C): Machine lifted/lowered.



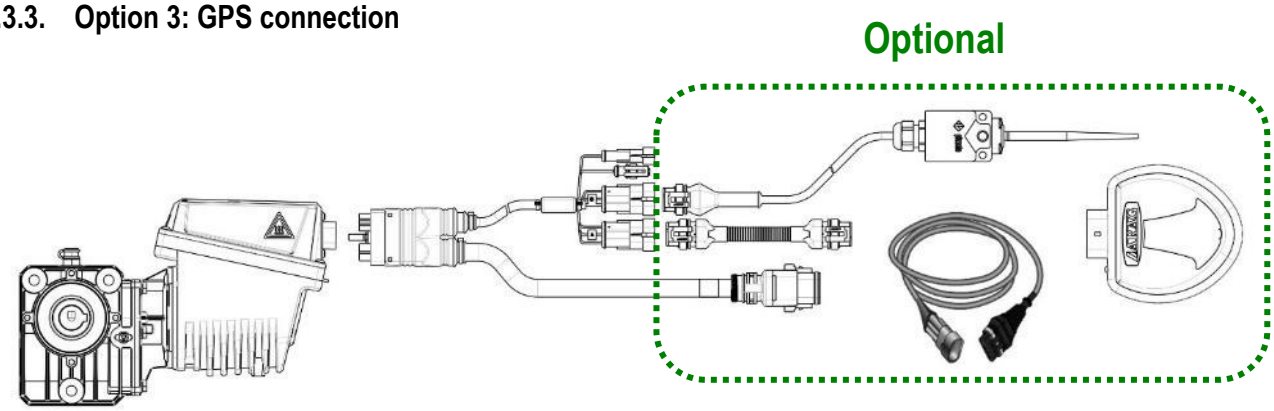

**Picture 2-9 ISO11786 connection cable**

The PROX_MACHINE (C) machine position signal coming from the from ISO11786 cable must be connected to the DMD X-tend cabling connector labeled as PROX_MACHINE.

Based on which ISO11786 cable signal you want to use to send the machine advancement information between SPEED_RADAR (A) or SPEED_IN (B), this connector must be connected to the DMD X-tend cabling connector labeled as SPEED_IN.

If one of the connections is not in use, it must be closed with the appropriate connector.

### 2.3.3. Option 3: GPS connection



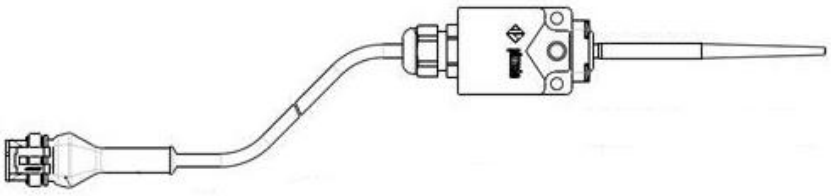

**Picture 2-10 GPS connection option**

A suitable GPS system is used. Together with the Agri-Motion X-tend base kit, an ARAG ATLAS 100 GPS (P/N 46701651) with cables can be ordered as an option.
This sensor must be connected to the DMD X-tend cabling connector labeled as SPEED IN.

*If other kinds of GPS are used, you need to check their compatibility.*

## 2.4. MACHINE POSITION SENSOR

It is a mechanical sensor (P/N ROJ 05R01422) used to define whether the machine is in seeding position (machine lowered) or in transport position (machine lifted).



**Picture 2-11 Position sensor**

The sensor must be fastened to the machine frame, a way that:

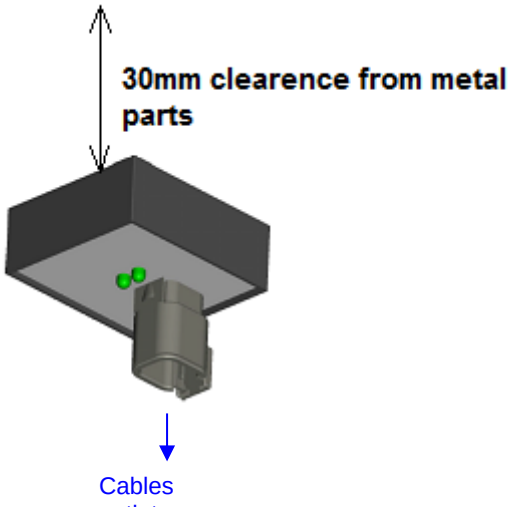
- in seeding position, i.e. when the machine is lowered, the sensor is de-activated
- in transport position, i.e. when the machine is lifted, the sensor is activated

The sensor must be connected to the DMD X-tend cabling connector indicated by PROX_MACHINE.

***WARNING: For a proper operation of the system, it must be connected to the motor that has been identified as motor 1 during the addressing phase.***

## 2.5. ACCESS POINT POSITIONING

The housing of the AP control unit should preferably be installed in a sheltered position of the machine, with the cable output facing downwards.



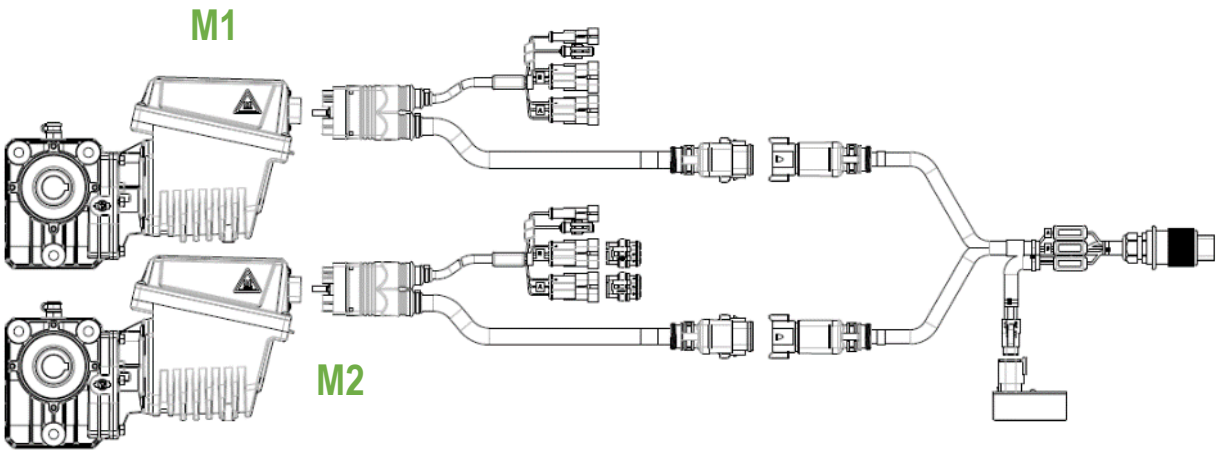

**Picture 2-12 AP positioning**

**The connector must be connected to the faceplate in order to avoid the entry of water and dust.**

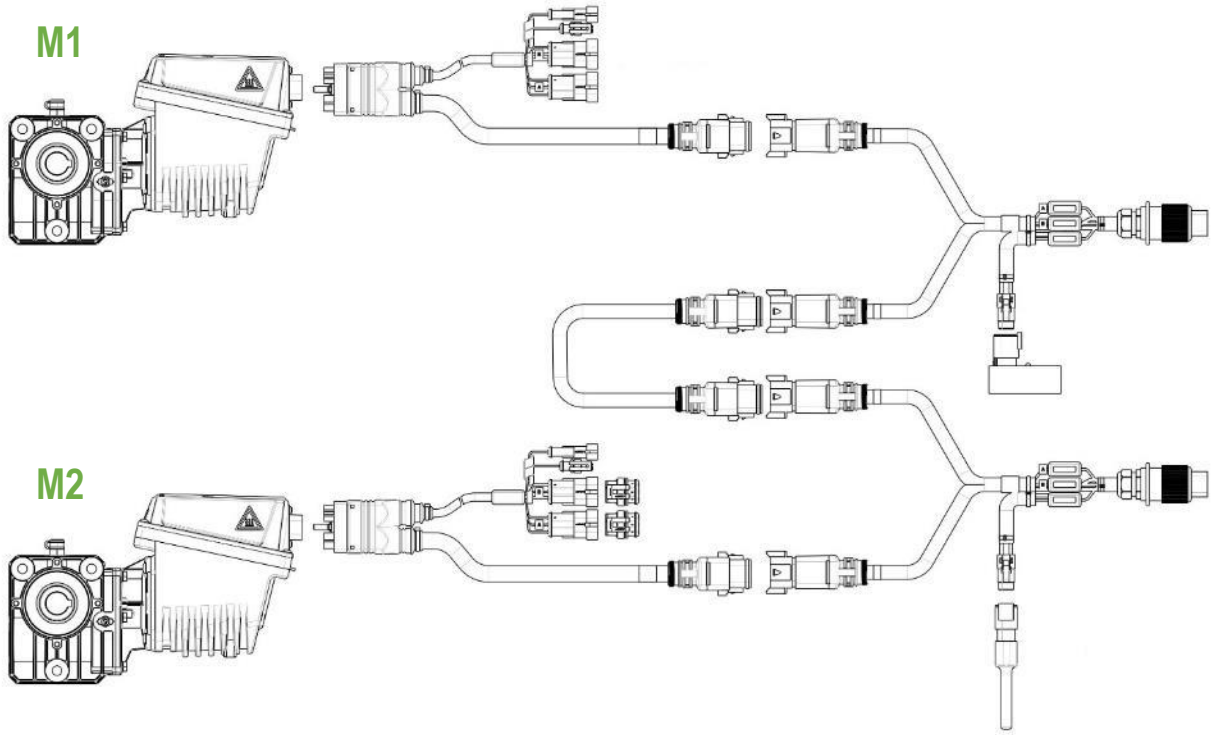
*The box contains the WI-FI module and the antenna. Install the box so that the flat back surface has a 30 mm clearance from metal parts. Violating this precaution will degrade the antenna efficiency, resulting in a reduced or impaired functioning of the AP.*

## 2.6. WIRING DIAGRAM

Depending on where you want to install the two motors, the Agri-Motion X-tend kit can be connected in two different ways:

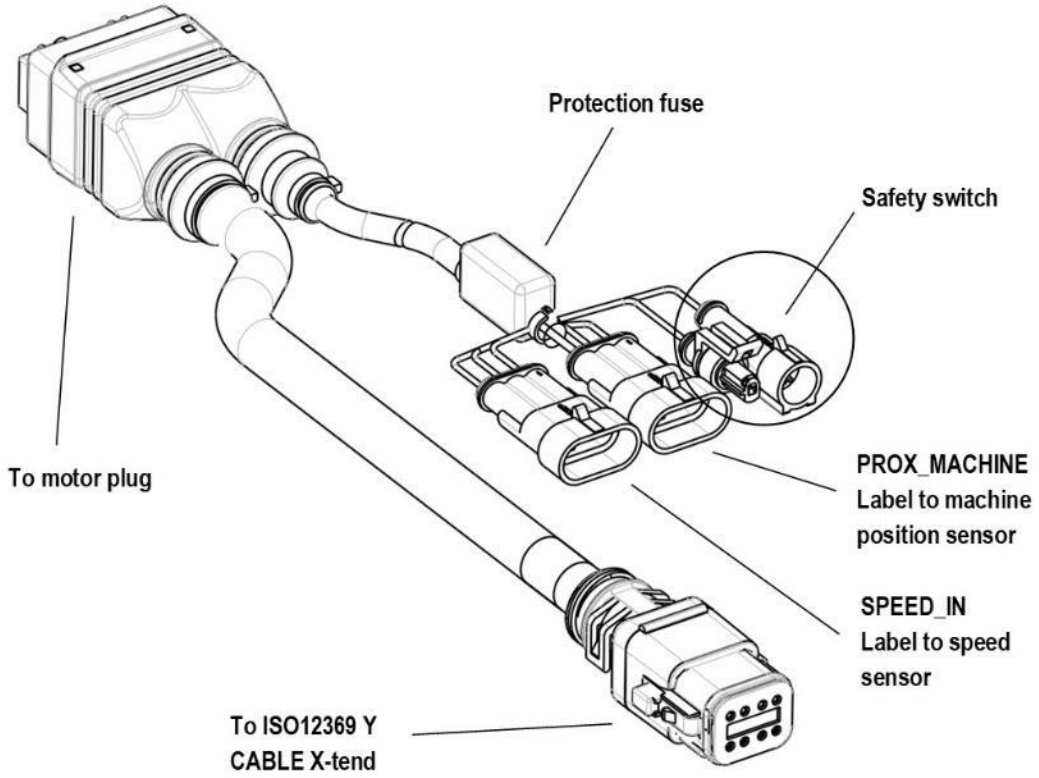



**Picture 2-13 Motor wiring diagram on similar applications on the same side (base kit)**




**Picture 2-14 Motor wiring diagram on two different applications, a front and a rear one (ask for a base kit integration to perform this configuration)**

### 2.6.1. X-tend DMD cable




**Picture 2-15 X-tend DMD Cable wiring diagram**

### 2.6.2. Safety devices on the movable guards of the groups with geared motor

Connection to the safety function: If the contact on the device is open, the DMD0 geared motor must not be able to rotate.

The safety function be implemented by using:

- an electro-mechanical switch with "positive opening" NC contact (condition indicated by the symbol ⊖) or
- an electromagnetic sensor with high reliability (e.g., SICK RE11-SA03 or equivalent)

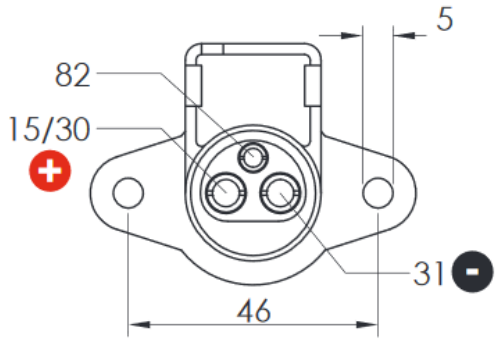
*In order to ensure the requested safety level (Performance Level = c – see paragraph 1.4.7), it is necessary to provide a safety contact with the following characteristics:* $\boldsymbol{B10_d \geq 2 \cdot 10^6}$

Note: $B10_d$ is the reliability parameter declared by the device manufacturer, corresponding to the number of switchings which can be guaranteed without errors.

*The safety switch is not supplied in the kit as it must be chosen according to the dimension requirements of the machine it will be installed on.*

### 2.6.3. Tractor plug

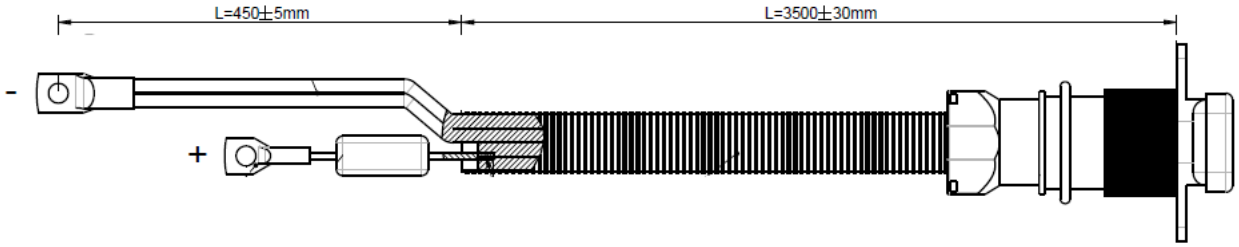
*The power cable of the ISO12369 X-tend cable (P/N ROJ 05R01561) must be connected to the ISO-12369 tractor plug.*




**Picture 2-16 ISO 12369 plug on tractor side**

*If a plug is not available, the following optional cable can be ordered, which can be used to connect directly to the battery in order to create an extension and which includes a protective fuse.*

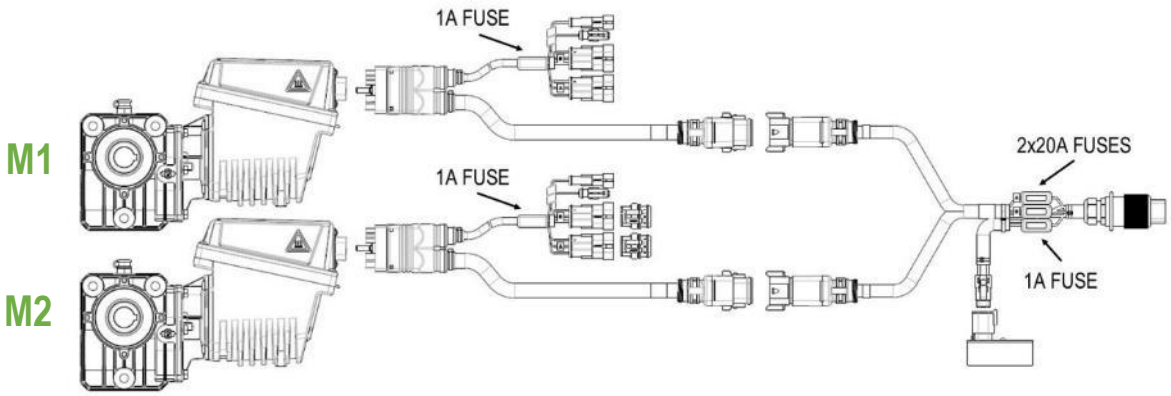
| Code | Description |
|---|---|
| 05R01412 | BAT CABLE - ISO12369 |




**Picture 2-17 ISO 12369 cable for direct connection to the battery**

### 2.6.4. Protective fuses

**To comply with safety regulations, the DMD X-tend and ISO 12369 cables include fuses to protect the components of the system.**




**Picture 2-18 Protective fuses**

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# 3. USER MANUAL

## 3.1. GENERAL DESCRIPTION

The Agri-Motion X-tend kit is controlled by means of the Android **Agri-Motion X-tend** application which can be downloaded from Google Play Store. Make sure you download the latest version available on the store.

This app allows you to monitor and set-up some system parameters by means of a smartphone or a tablet, using Wi-Fi connection.

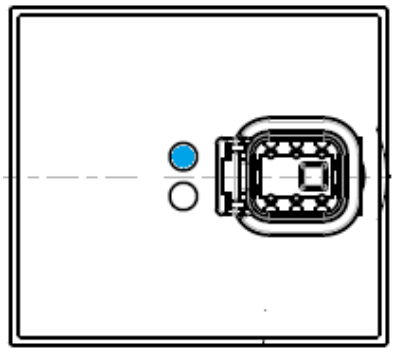
## 3.2. CONNECTION TO THE ACCESS POINT

In order to connect the portable device to module, turn on the WiFi interface and scan the networks; the module is listed as an Access Point with default SSID **ROJDMDWIFI** and the default password is **rojdmdwifi**.

The default SSID and Password can be changed on the Configuration page. (See dedicated explanations in the Configuration section)

When the connection is up, launch the app on your mobile device.

**Blue LED:**
When the AP is ON and the Wi-Fi network is active, the blue led on the AP lights up.

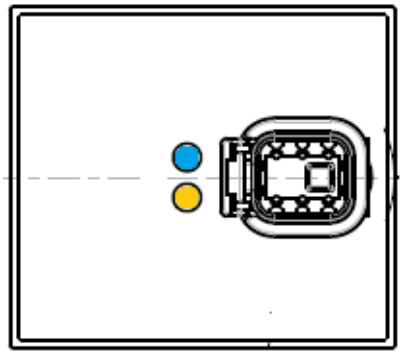


**Picture 3-1 Access Point: Blue status LED for Wi-Fi connection**

**Orange LED:**

Press the button with a chain symbol in the middle of the “Home” page to start the functionality of the application.  → 

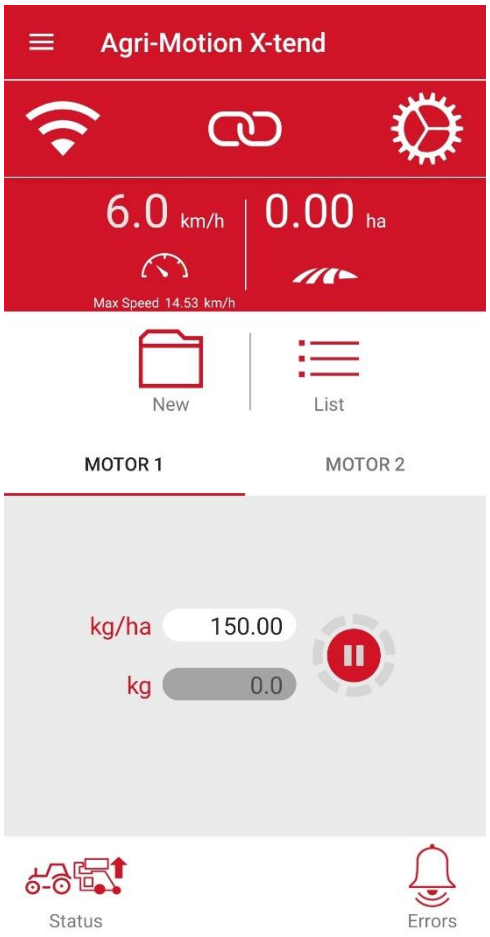
In this condition the orange LED lights up.



**Picture 3-2 Access Point: Orange CAN bus connection status LED**

## 3.3. HOME PAGE

Picture 3-3 shows the application home page. In the following paragraph the different functions will be described.




**Picture 3-3 Agri-Motion X-tend Main page**

### 3.3.1. Connection and configuration buttons

At the top of the application home page, there is a bar, like the one indicated in Picture 3-4, that allows you to manage the connections and configurations.

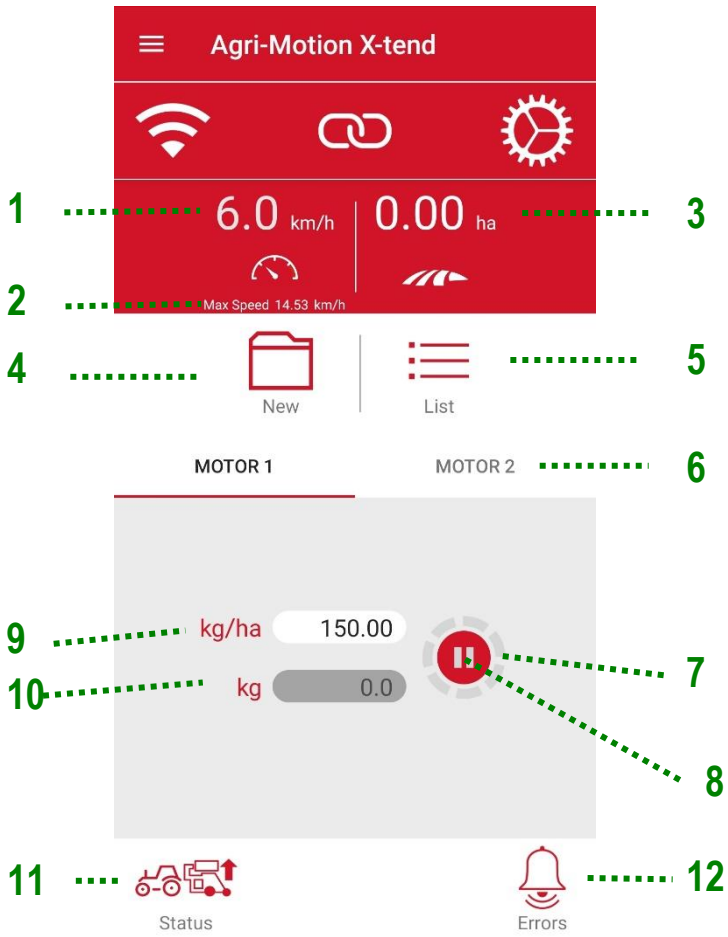

**Picture 3-4 Connection and configuration bar**

| Field | Function | Description | |
|---|---|---|---|
| 1 | Wi-Fi connection status |  | Connection OK |
| | |  | (blinking) Connection Poor |
| | |  | Connection Lost |
| 2 | CAN bus connection status |  | CAN Connection Lost or disconnected. **If pressed, it connects the AP to the motor**. |
| | |  | (blinking) CAN connection poor |
| | |  | CAN Connection OK **If pressed, it disconnects the AP from the motor** |
| 3 | Link to the configuration page |  | Press on this icon to open the configuration page |

*For the connection of the AP to the motor, press the CAN connection button. When the CAN connection is active, the yellow LED on the AP lights up.*

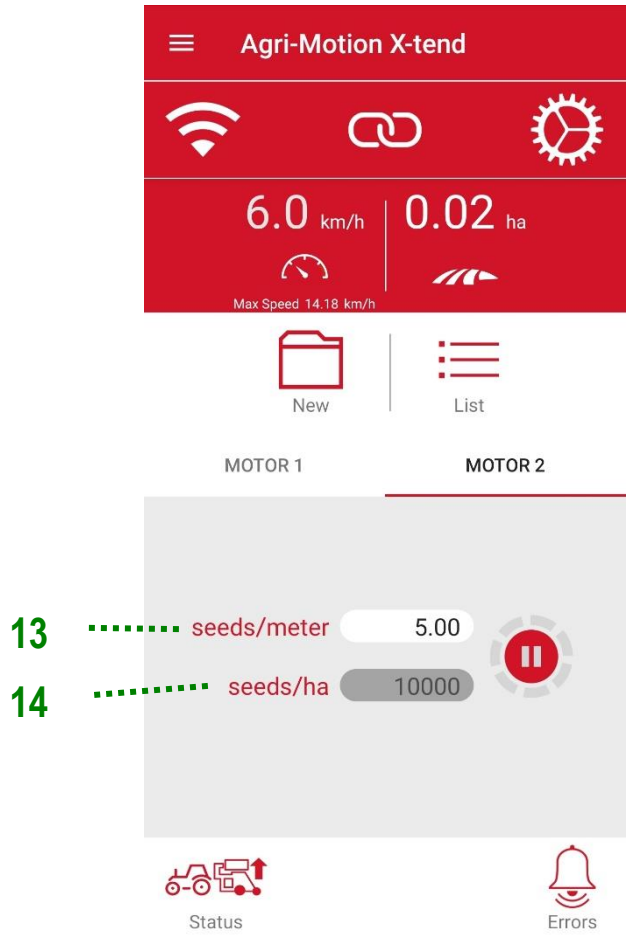
### 3.3.2. Job information and settings

Screen with Motor 1 in **kg/ha** mode (e.g., fertilizer).
The choice is made when the machine type is selected (see 3.4.2)




**Picture 3-5 Main page in kg/ha mode**

Screen with Motor 1 in **seeds/ha** mode (single seed distributor).
The choice is made when the machine type is selected (see section 3.4.2)




**Picture 3-6 Main page in seeds/m mode**

| Field | Function | Description | |
|---|---|---|---|
| 1 | Speed | Seeder [km/h] | |
| 2 | Max. speed | Maximum seeding speed allowed with these settings. | |
| 3 | Area | Partial hectare counter | |
| 4 | Start/Stop Job |   | To start a new job and reset all the counters. |
| | |  | It stops the counters and saves data |
| 5 | Jobs List | It opens the job window (see chapter 3.8) | |
| 6 | Motor tab | It allows you to select the engine whose parameters need to be displayed and modified | |
| 7 | Rotation of the selected motor | It indicates the rotation status of the selected motor | |
| | |  | Solid gray icon = the motor is NOT rotating |
| | |  | Rotating red icon = the motor is rotating |
| 8 | Selected motor status |  | OK. If pressed, prefill starts |
| | |  | OK. Prefill in progress |
| | |  | OK. Normal working status |
| | |  | Manually excluded |
| | |  | Error |
| 9 | Quantity per hectare to be spread (target) | Range [1-1000 kg/ha]<br>Product quantity per hectare.<br>User configurable and related to the selected motor | |
| 10 | Total spread quantity | Quantity of product distributed during the active job. | |
| 11 | Machine position |  | Machine lifted (transport position) |
| | |  | Machine lowered (working position). |

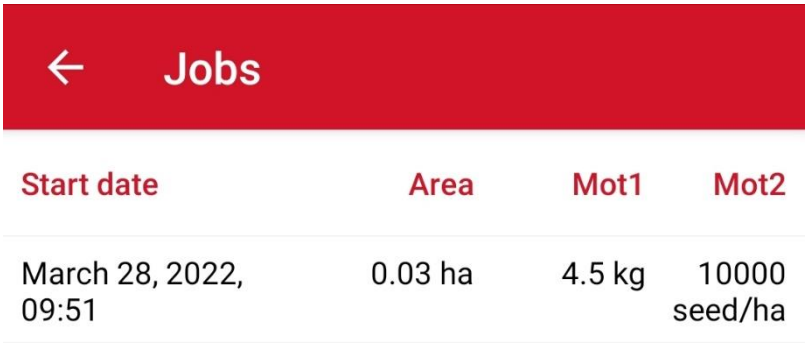
| Field | Function | Description | |
|---|---|---|---|
| **12** | Error button |  | No active alarm |
| | |  | Alarm active. If pressed, opens the alarm list. (see chapter 3.3.3) |
| **13** | Seeds/m | To set the quantity of seeds per linear meter | |
| **14** | Seeds/ha | Population calculated based on seeds/m and machine width | |

*Note that the hopper will spread the product even if the*  *button hasn't been pressed.*

*The*  *and*  *buttons control the start and the end of the jobs that will be stored in the Jobs List (see chapter 2)*

### 3.3.3. Jobs List

The Jobs window allows to keep track of jobs
Each job corresponds to a row on the table indicating the job summary with summary data for the selected machine configuration.



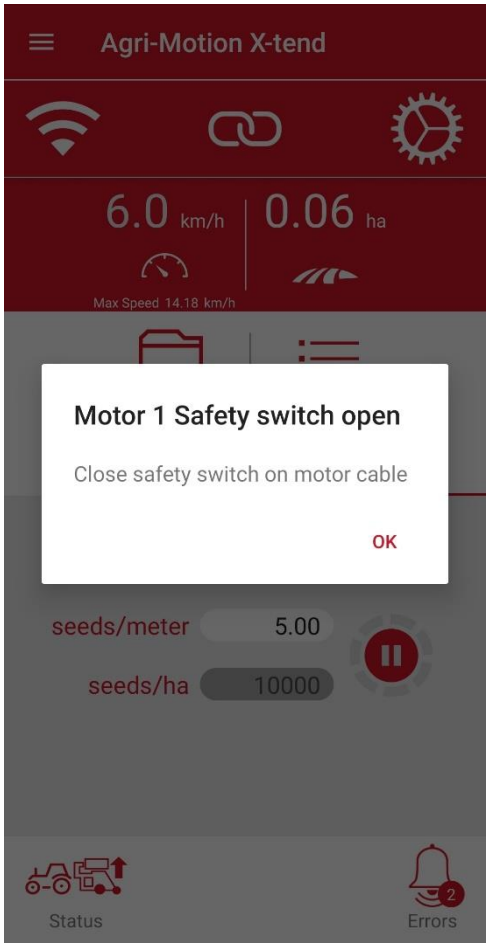

**Picture 3-7 Jobs list**

The following information are stored:

- Start date
- Stop date
- Area covered
    - If you have selected **kg/ha** as the product to be spread, the total (estimated) weight in kg of the distributed product will be indicated.
    - If you have selected the product to be spread as **seeds/m** the distributed product quantity per hectare will be indicated as seeds/ha.

### 3.3.4. List of Alarms

When an error occurs, a pop-up window is opened alerting the user of the error situation.
Press OK to acknowledge the error and close the pop-up window.
Note: If the error condition persists, the error will remain active and it will be shown in the Error icon.



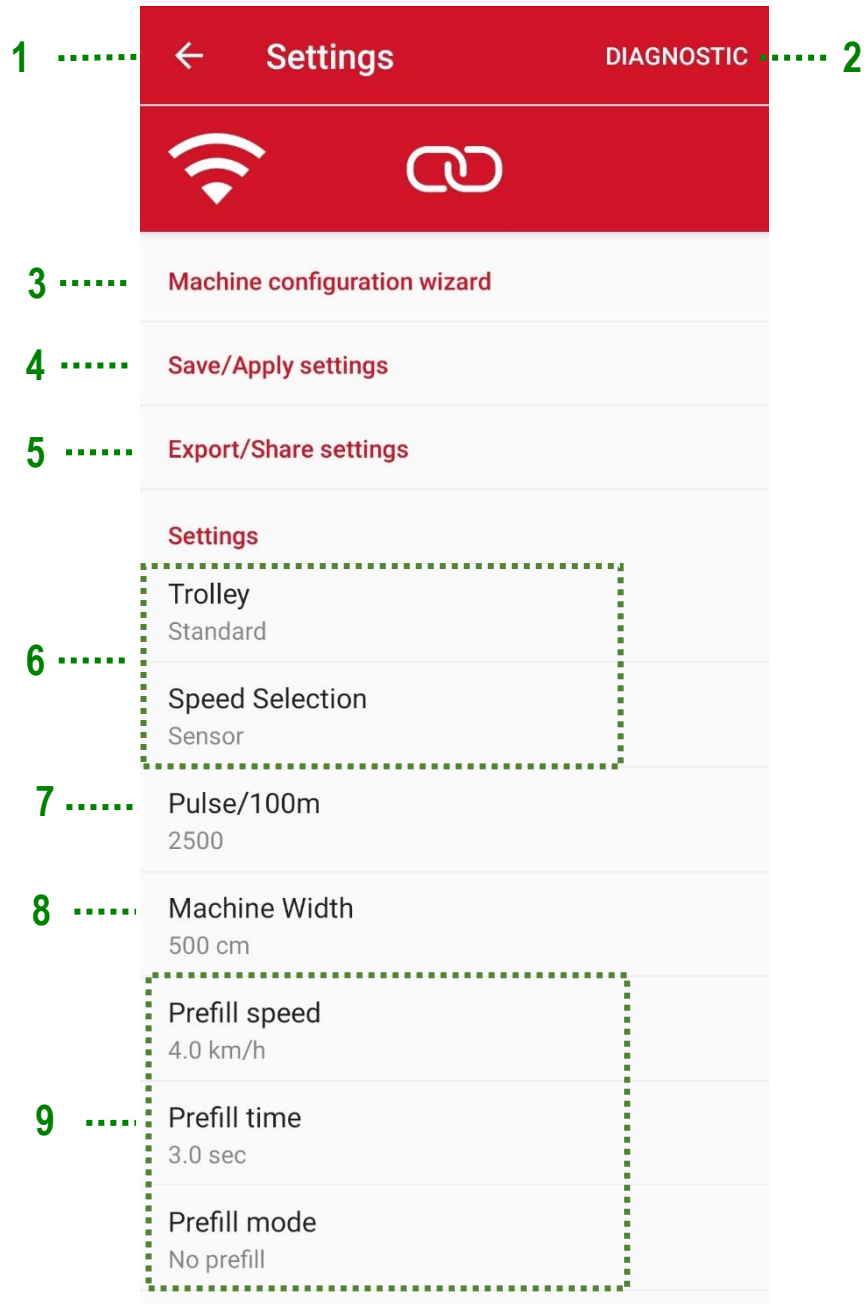

**Picture 3-8 Example of alarm**

If an Alarm is present and the Alarm key is pressed  , an Alarm List section opens, as shown in Picture 3-9, where all active alarms are displayed with the error name, type, and troubleshooting suggestion.

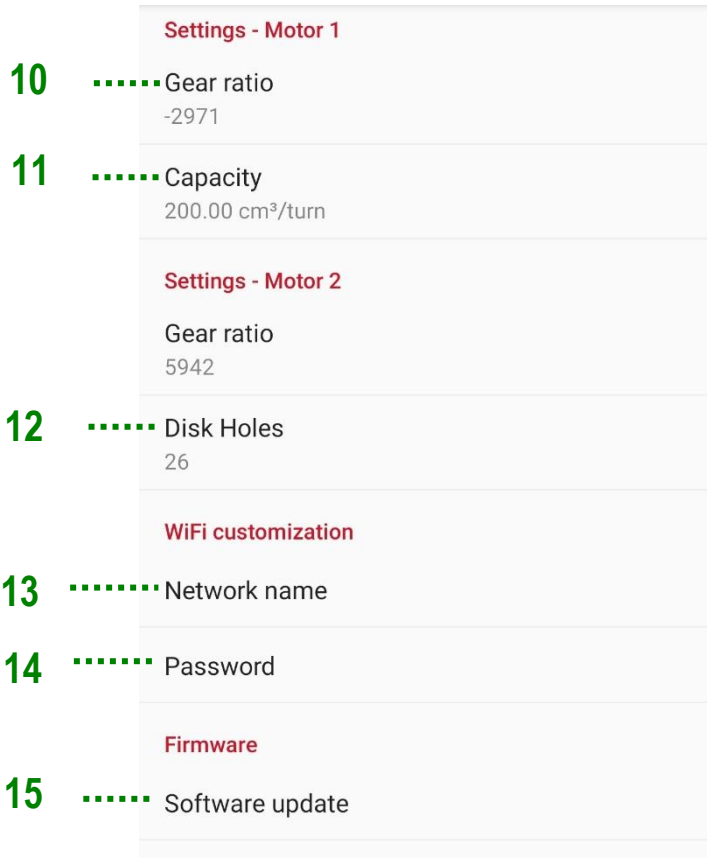

**Picture 3-9 List of errors**

## 3.4. SETUP

To access the setup page, press the button.
It contains a number of fields used to configure the behaviour of the system.




**Picture 3-10 Settings part 1**




**Picture 3-11 Settings part 2**

| Field | Function | Description |
|---|---|---|
| 1 | Back | If pressed, go back to the home page |
| 2 | Diagnostics | It allows to access the Diagnostics page (see chapter 3.4.12) |
| 3 | Machine Setup - Wizard | See chapter 3.4.1 |
| 4 | Save/Recall Settings | It saves the current settings and recalls them when necessary (see chapter 3.4.10) |
| 5 | Export/Share Settings | It exports the settings screen (as an image) and sends it via digital media. |

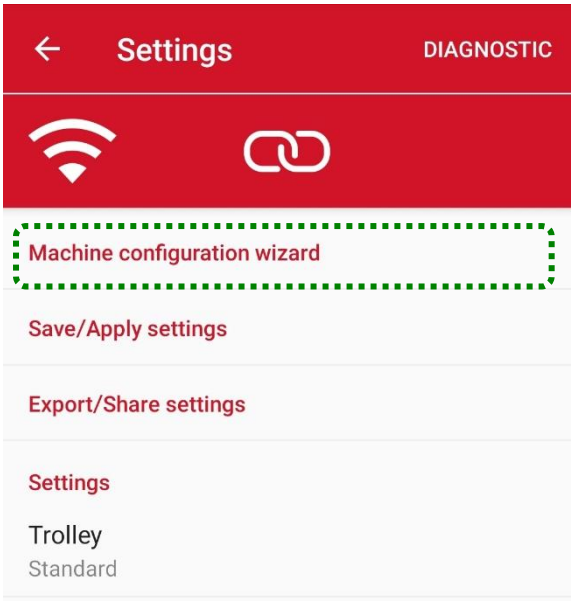
| Field | Function | Description |
|---|---|---|
| **6** | Speed and lifting device sensor setting | See chapter 3.4.6 |
| **7** | Pulses/100m | See chapter 3.4.7 |
| **8** | Machine width | See chapter 3.4.4 |
| **9** | Prefill speed<br>Prefill time<br>Prefill mode | See chapter 3.4.8 |
| **10** | Reduction ratio | See chapter 3.4.5 |
| **11** | Capacity per revolution | See chapter 3.4.9 |
| **12** | Disc holes | It allows to set the number of holes on the seeding disc in use |
| **13** | Network name | New name (SSID) for the WiFi created by the X-tend AP. |
| **14** | password | New password for the Network. |
| **15** | Software update menu | It allows to update the Access Point and MD firmware |

**Note that there is no means to reset the factory setting for the Network name and password, consequently be careful to take note of the new password when changing it, otherwise it will not be possible to enter the access point data anymore.**

### 3.4.1. Machine Configuration – Wizard

Access the settings page by pressing the button at the top right of the Home screen.
Select the **"Machine Configuration - Wizard"** option to begin the procedure, as shown in Picture 3-12.

*If you only want to change one parameter, you can access the individual settings, as described in chapter 4.5.*



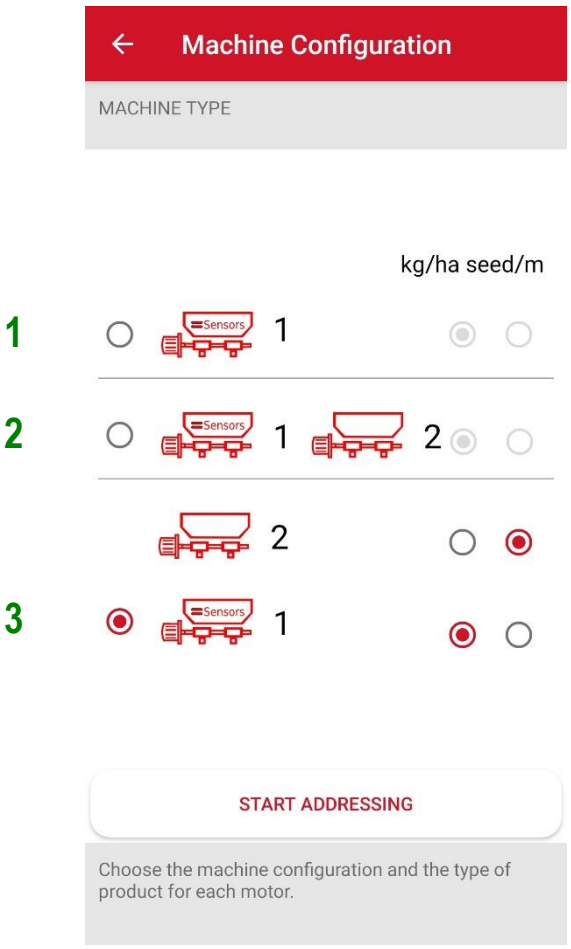

**Picture 3-12 Settings: Machine Configuration – Wizard**

### 3.4.2. Machine type selection

The first step of the configuration wizard allows you to select the type of machine and the type of product to be spread.

Select **kg/ha** to spread a granular product (e.g., fertilizer or seeds) proportionally to the worked area.

Select **seeds/m** to spread seeds with precision single seed precision distributors.

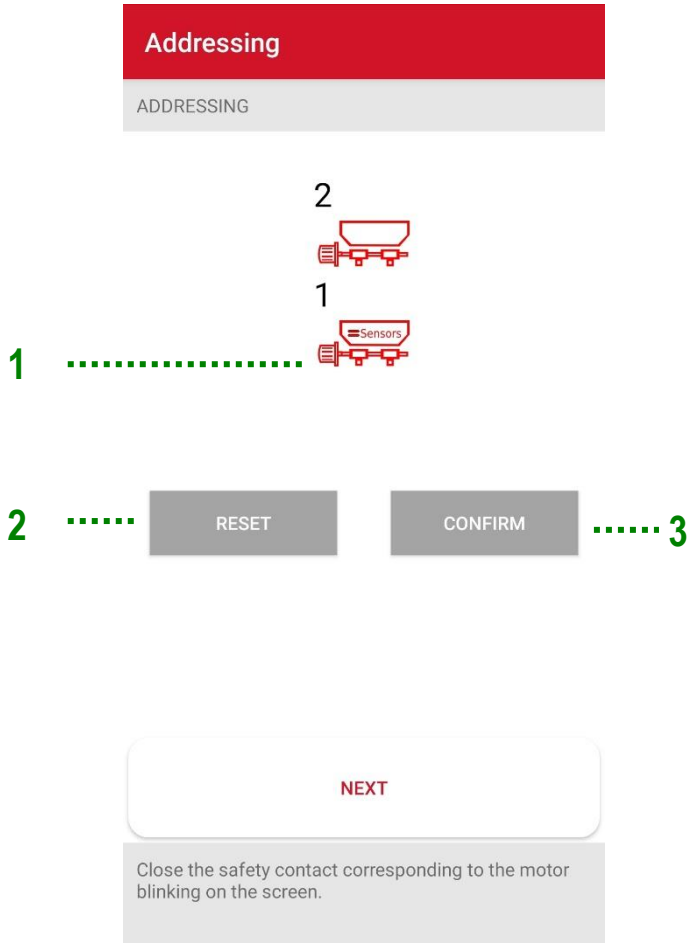



**Picture 3-13 Machine Type**

| Field | Function | Description |
|---|---|---|
| 1 | One motor | Only one motor is used |
| 2 | Two parallel motors | Both motors are used with the same parallel application |
| 3 | Two independent motors | The two motors are controlled separately. Usually for two different applications. |

### 3.4.3. Motor addressing

Subsequently, in order to allow the system to identify the motors, it is necessary to carry out the motor addressing procedure.
If the addressing has already been successful, the motors will be indicated in red.

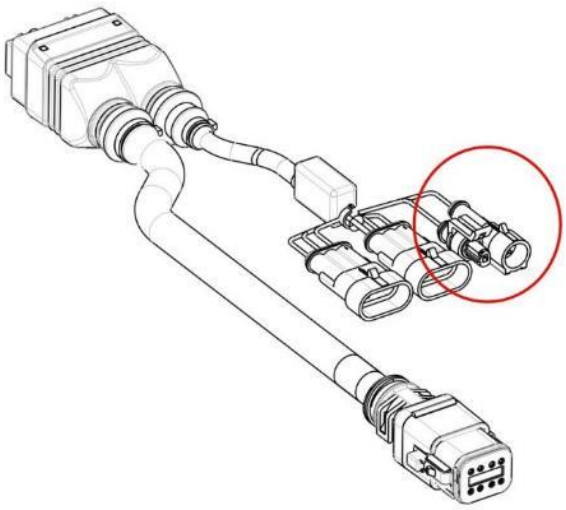



**Picture 3-14 Addressing**

| Field | Function | Description |
|---|---|---|
| **1** | Motor status |  Motor not yet addressed<br>  (flashing) Motor to be addressed<br>  Addressed motor |
| **2** | Start addressing | It clears the address of the motors and starts a new addressing session after confirmation. |
| **3** | Confirm addressing | |

To perform the addressing procedure, it is necessary to follow these steps:

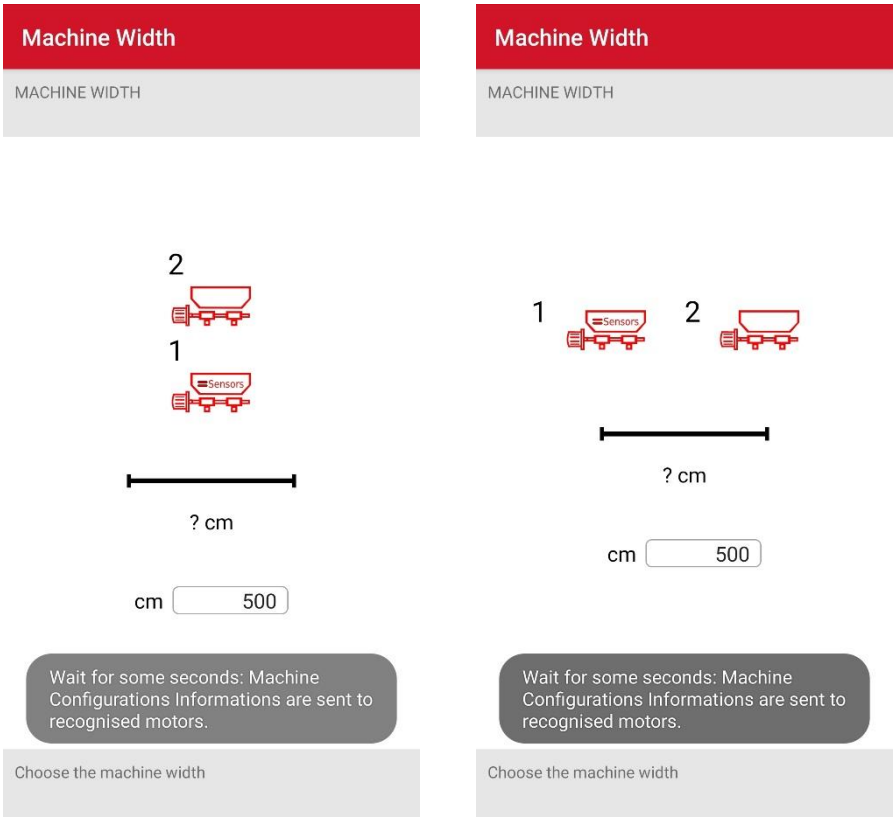
1. Press the Initialize button and confirm.
2. The icon referring to the motor to be addressed starts flashing.
3. Open and close the safety contact (see Picture 3-15) of the cable corresponding to the motor which is flashing on the synoptic tab.
4. The motor address is assigned to that position and the motor icon turns red.
5. If necessary, repeat the procedure for the second motor. Otherwise confirm and continue the configuration.



**Picture 3-15 DMD X-tend cable**

### 3.4.4. Machine width setting

In this screen it is possible to set the working width of the machine. Depending on machine type you have chosen, the width can refer to the overall width of the two side-by-side applications (right) or to the single width, in the case of applications in a row (left).



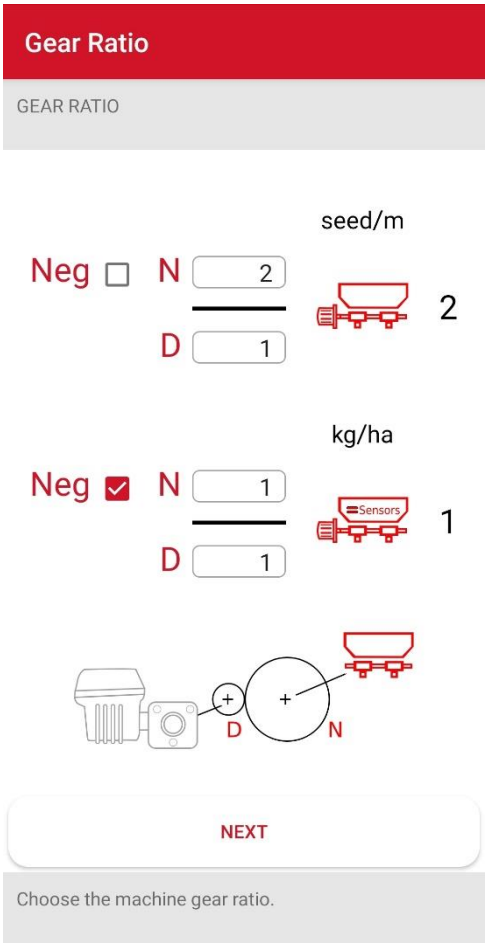

**Picture 3-16 Machine width**

*If the system is configured with two motors working side by side, the machine width is meant as the overall working width and not as the individual motor one.*

### 3.4.5. Reduction ratio setting

If there is a further reduction between the output shaft of the Agri-Motion X-tend kit motor and the distributor, it is possible to set the motors reduction ratio for the correct operation of the system.
Simply count the number of teeth of the cogged wheels on the motor side (“D”) and on the distributor side (“N”) and fill in the numeric fields accordingly.
The direction can be changed by selecting the “Neg” parameter corresponding to the desired motor.

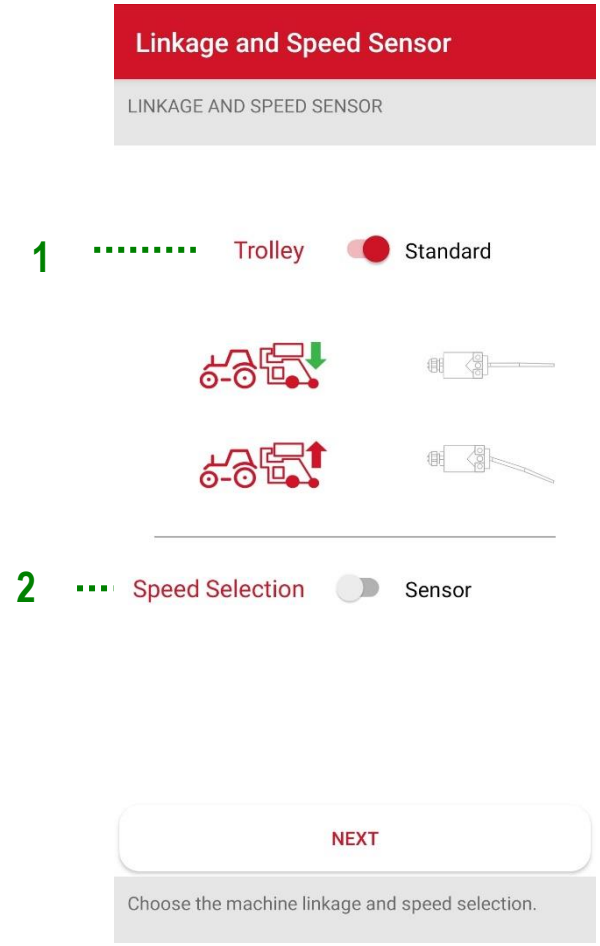
If the motor shaft is connected to the distributor without reductions, leave parameters N and D at 1.



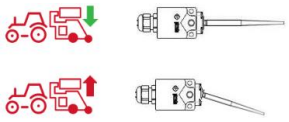
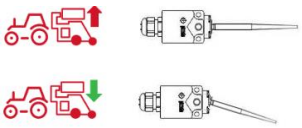

**Picture 3-17 Reduction ratio**

### 3.4.6. Sensors setup

This page allows you to set the activity status of the sensor for the machine position detection system (machine in working position and machine in transport position) and the selection of the speed reference as shown in the table below.

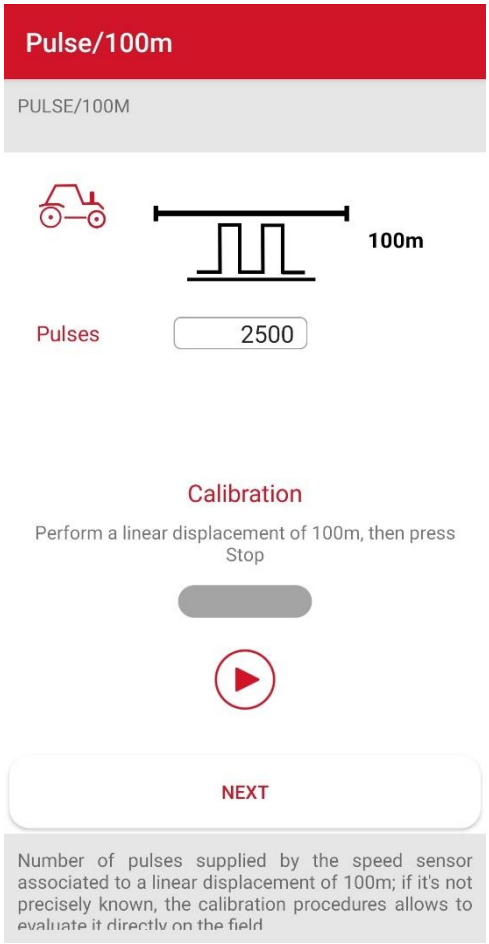



**Picture 3-18 Carriage and speed sensor**

| Field | Function | Description |
|---|---|---|
| **1** | Sensor activity level | It indicates the operating mode of the machine position detection system:<br>**Standard**<br>When the sensor is off or disconnected, the machine is in working position:<br>  <br>**Reverse**<br>When the sensor is active, the machine is in working position:<br>  <br>Choose this setting if you want to connect the machine to an **ISO 11786 tools socket** with **05R01423** cable. |
| **2** | Speed selection | *Sensor*: input from the physical sensor.<br>*Simulated*: the tractor speed is fully simulated, using the selected Prefill speed value (see dedicated section). For example, if you choose a Prefill speed value of 5km/h, selecting "Simulated", the Agri-Motion X-tend kit will simulate a working speed of 5km/h.<br>This function is useful in case of faulty speed sensors to be able to continue the job.<br>***WARNING**: If the "Simulated" option is selected when the machine is ON, it is necessary to set the machine to transport position and go back to the working position in order to activate the simulated speed.* |

### 3.4.7. Pulses calibration 100/m

The calibration of the number of pulses on 100 m is very important for the proper operation of the system according to the advancement speed. A poor calibration can result in a different metering than the one set, as well as to records about the effective worked area and the metering which do not correspond to reality.




**Picture 3-19 Pulses/100m**

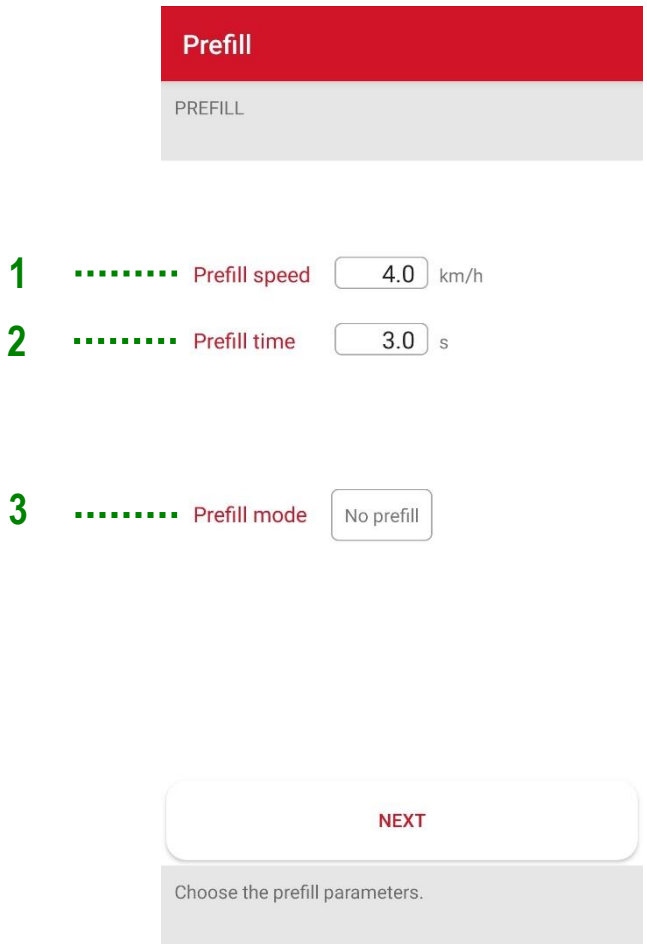
**Option 1 - Speed sensor connection:**
If the sensor on the cogged wheel is used to determine the advancement speed, it is possible to run the calibration procedure. To do this, press the start button, travel a 100 m distance with the machine lowered and stop the vehicle. During the travel, the wheel sensor will count the pulses and provide the correct number of pulses per 100m.

**Option 2 - ISO plug connection:**
A value of 13000 pulses is normally used on a distance of 100m. In case of doubt, check the characteristics of the acquisition system.

**Option 3 - GPS connection:**
If the option with ARAG ATLAS 100 GPS is used, a base value of 10000 pulses per 100m is used. If you are using different components, check the documentation for the relevant product.

### 3.4.8. Prefill function

The prefill function can be used to start the hopper earlier, in order to make sure that the delivery tubes are filled with product before moving.




**Picture 3-20 Prefill**

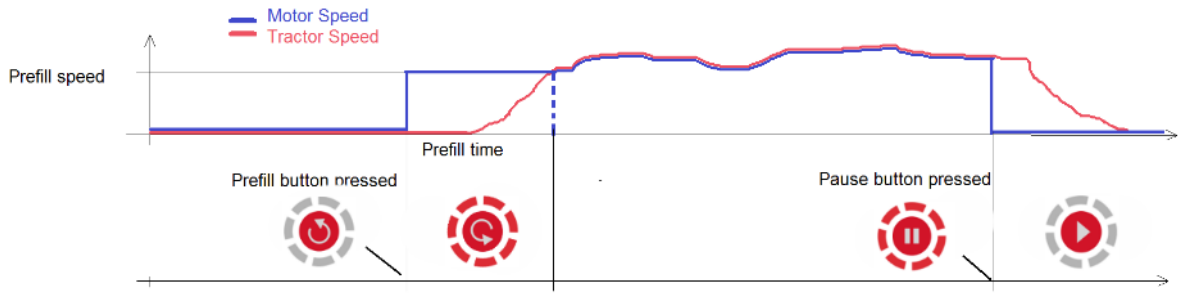
| Field | Function | Description |
|---|---|---|
| 1 | Prefill speed | The prefill speed determines the rotation speed of the motor during prefill, during calibration and in case of simulated speed. (See 4.4.5 Sensors setup).<br>Select a value which is close to the working speed of the tractor during the job.<br>(e.g., if the tractor at cruise speed drives at 6km/h, choose 6 km/h for this parameter as well). |

| Field | Function | Description |
|---|---|---|
| 2 | Prefill time | When the prefill is started by the user, the motor turns at cruise speed for a time equal to the "Prefill time" seconds before starting autonomously and following the tractor.<br>The tractor should start moving slowly before the prefill time expires. |
| 3 | Prefill mode | You can choose among the following options:<br>• *No prefill*<br>• *Normal*<br>• *Automatic* |

***Prefill Mode "No Prefill"***
If the prefill Mode "No Prefill" is selected, the Prefill function is disabled.

***Prefill mode "Normal"***
If the prefill Mode "Normal" is selected, the prefill is carried out as shown in Picture 3-21.

If prefill button is pressed  the motor starts rotating at a constant speed as if the tractor was moving at "Prefill Speed", independently from the actual tractor speed, i.e., the signal coming from the speed sensor.
The motor will then start following the tractor speed after the "Prefill time is expired".




**Picture 3-21 Prefill function**

Note that the prefill option  is enabled as follows:

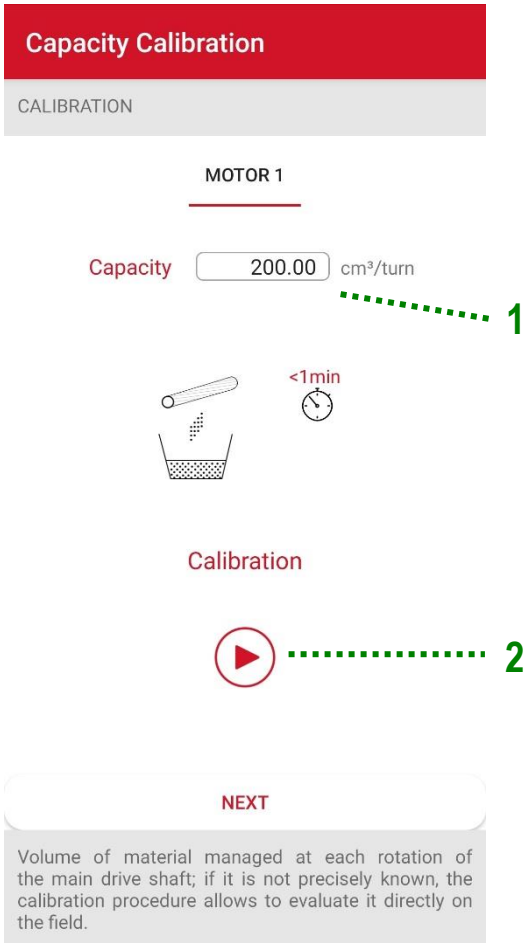
- At the first power-up
- When the motor is stopped manually with the button  and the machine is still lowered. After the machine has been lifted, the prefill option is available again.

***Prefill mode "Automatic!***

If the prefill Mode "Automatic" is selected, the prefill is automatically carried out each time you switch from the transport position (machine lifted) to the working position (machine lowered) without having to press the button  .
The prefill speed and duration are determined respectively by "Prefill speed" and "Prefill time".

*In this mode, if any motor has been manually disabled, the motor will automatically be enabled again after the machine is lowered.*

### 3.4.9. Capacity calibration

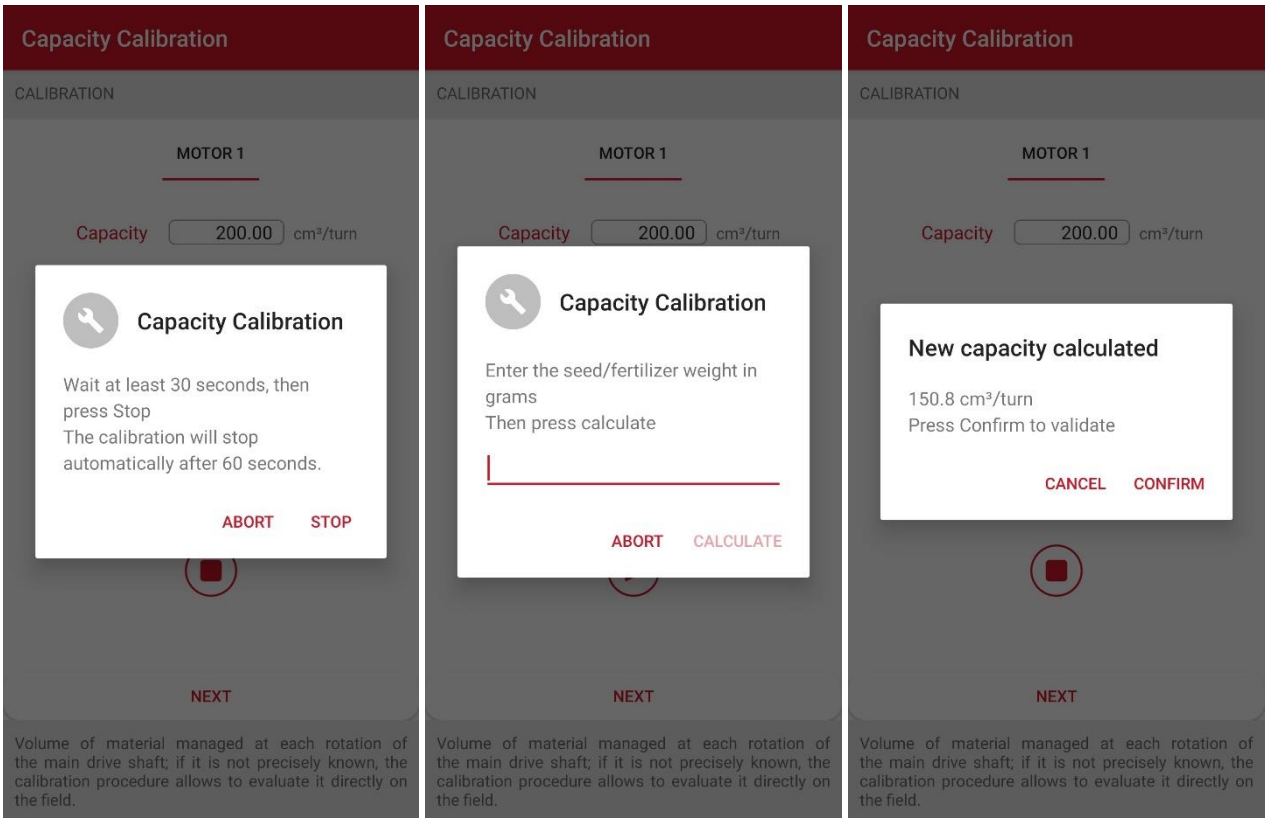



**Picture 3-22 Capacity calibration**

| Field | Function | Description |
|---|---|---|
| 1 | Capacity per revolution | The capacity per revolution of the distribution hopper set or calculated during the calibration procedure. |
| 2 | Capacity calibration | The capacity calibration procedure starts. |

**Capacity calibration procedure**

1. Before starting, fill the tank and run the hopper/distributor until it starts to deliver the product, then stop the motor to ensure that all pipes are full.
2. Place an empty container of the appropriate size at the hopper outlet to collect the material.
3. Start the procedure by pressing the “Play” button indicated as 2 in Picture 3-22.
4. Wait at least 30 seconds and press “Stop”, or wait for the motor to stop automatically after 60 seconds.
5. Weigh the delivered material.
6. Enter the result in grams in the window.
7. Press “Calculate”.
8. The result obtained by the procedure will be displayed.
9. Press “Confirm” to end the procedure and confirm the indicated value.




**Picture 3-23 Capacity calibration procedure**

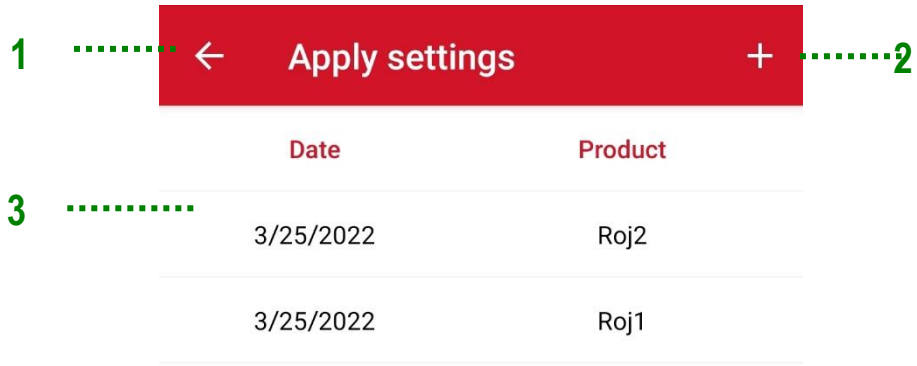
### 3.4.10. Save/Recall Settings

The Save/Recall Settings window allows you to store all the main settings and recall them when necessary.

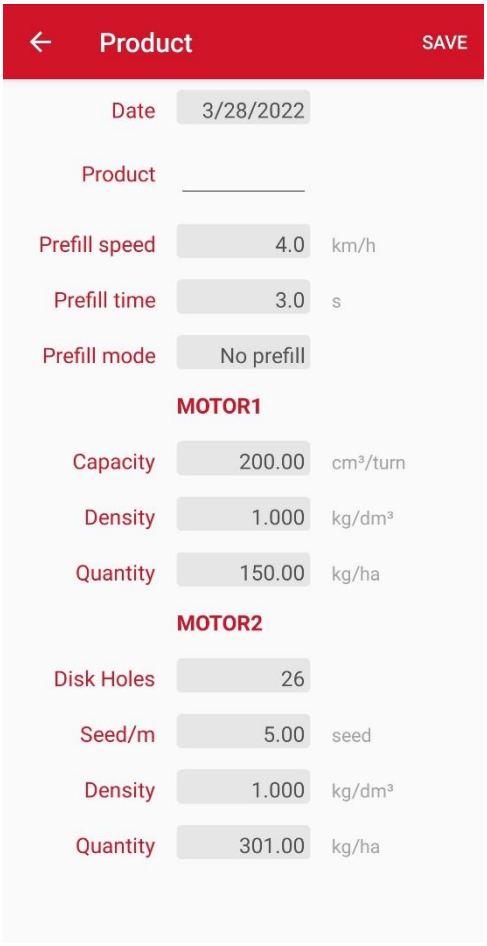
The data refer to the selected machine configuration.

Important parameters for the calibration are:

- Capacity per revolution (if the motor is configured as kg/ha)
- Disc holes and seeds/m (if the motor is configured as seeds/m)
- Distributed product quantity
- Prefill speed (this value is the same for all motors).




**Picture 3-24 Recall Settings**

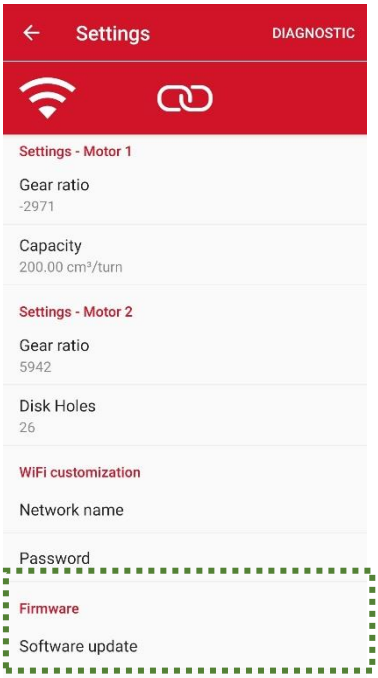
| Field | Function | Description |
|---|---|---|
| 1 | Back | If pressed, allows to go back to the main page. |
| 2 | "+" button | It adds a new row with the current settings. The operator is prompted to enter the product name/settings name.<br>  <br><br>Press "**Save**" to save the selected settings. |

| Field | Function | Description |
|---|---|---|
| 3 | Select/Delete calibrations | *Select*:<br>When selecting a row from the settings list, a window is displayed with a summary of the relevant parameters that will be set.<br>  <br><br>Press "**Load**" to load the selected settings into Agri-Motion X-tend.<br>Press "**Clear**" to delete the settings selected in Agri-Motion X-tend.<br>Press "**Cancel**" to return to the settings list. |

### 3.4.11. Software update

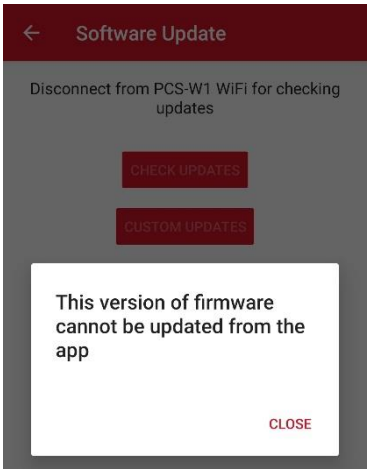
Follow the instructions below to identify the software versions of your system and to update the various devices.

1. Go to the settings page and select “Software update”.




**Picture 3-25 Settings: Firmware**

2. Skip the instruction pages.
   a. If the message in Picture 3-26 is displayed, it means that you are using a **first generation** Agri-Motion X-tend (or PCS W1) which has to be replaced by a next generation AP.

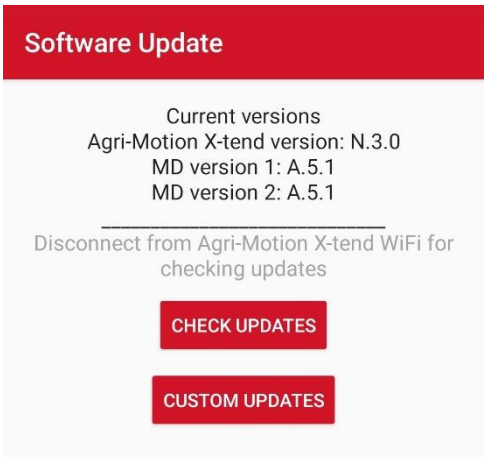



**Picture 3-26 Alarm Update not possible**

b. If the following page is displayed, it is possible to determine the version listed in “Agri-Motion X-tend versions” and “MD versions”.

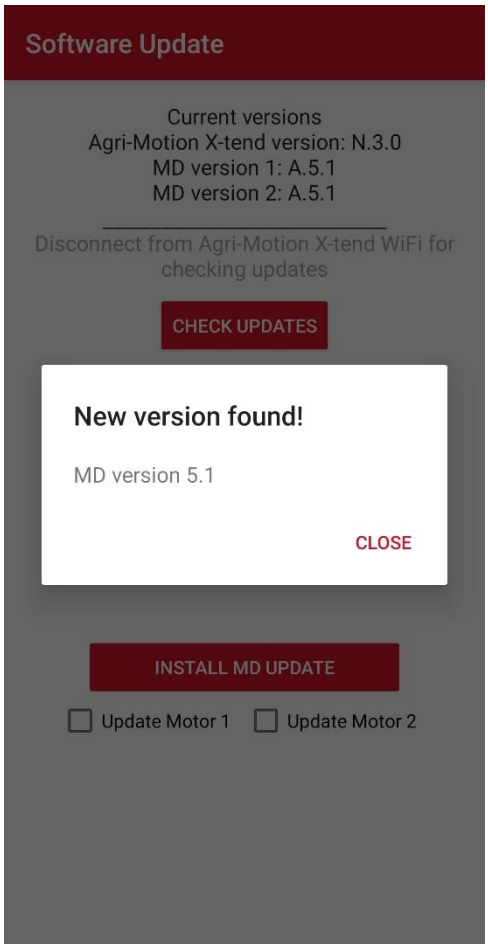

**Picture 3-27**

3. Once you have checked the SW version for the AP and MD, you can proceed with the next update if necessary. To do this, it is necessary to connect your smartphone or tablet to a data network that should be different from the one created by Agri-Motion X-tend. After this operation the “Check for Updates” and “Custom Update” buttons in the App will be enabled.

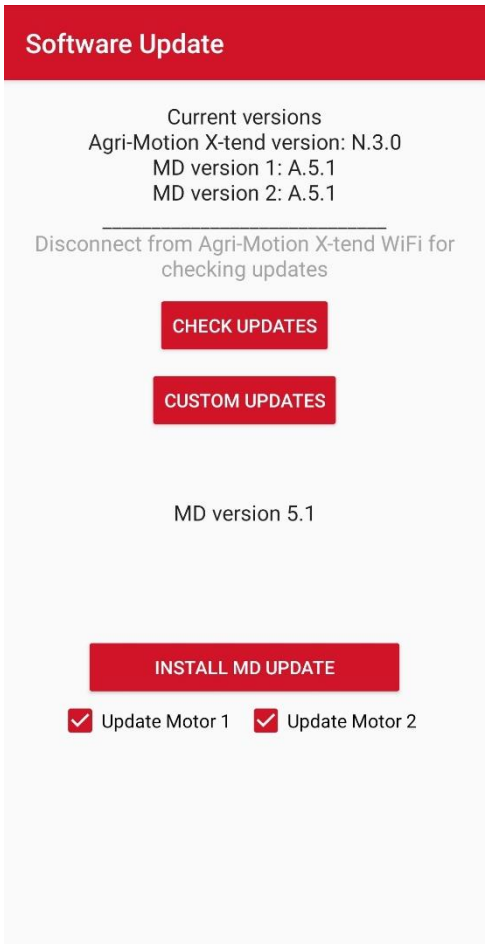



**Picture 3-28**

4. The “Check for Updates” button allows to check whether newer SW versions for the AP and MD are available on the network. The “Custom update” button instead allows you to access a window that requires the identification code of the versions to be downloaded (usually upon indication by the Roj technical dpt. for particular situations). The pop-up window displayed shows the latest versions that can be downloaded on your phone. After that press “Close” and, if desired, press the “Update MD” button to select one or more motors to be updated, and/or “Update AP”.




**Picture 3-29**

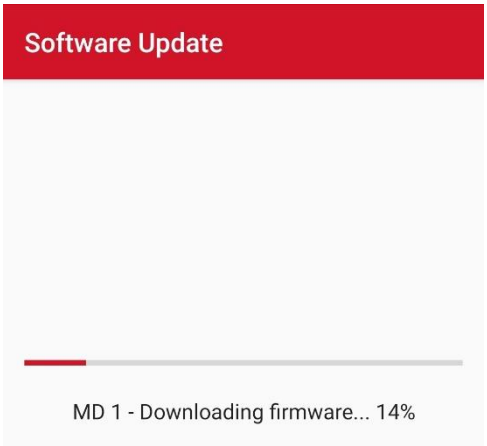


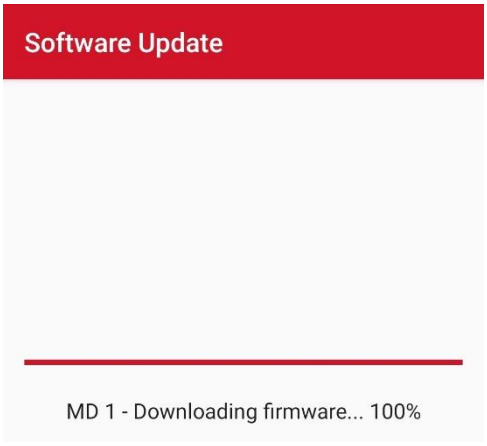

**Picture 3-30**

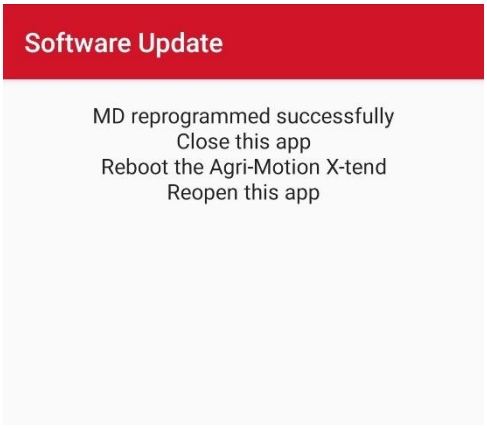
5. Once the update buttons have been pressed, the SW will be downloaded to the phone and ready to be uploaded to the AP or MD.


**Picture 3-31**

6. Then simply reconnect your smartphone to the AP X-tend network and download the updates. The progress bar will show you the download progress as indicated in the pictures.
   Note that when you reconnect to the network, the “Start Update” button is enabled.

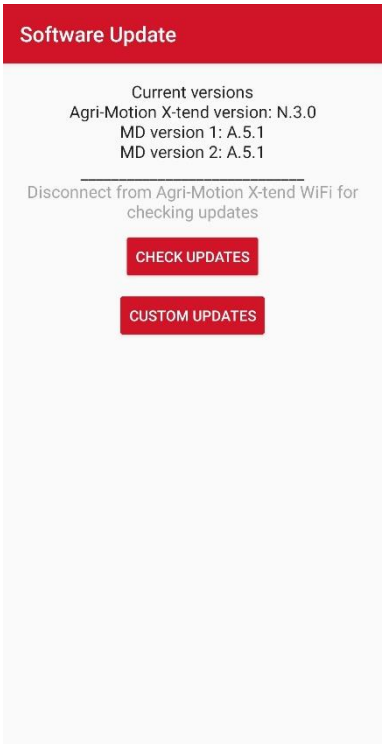



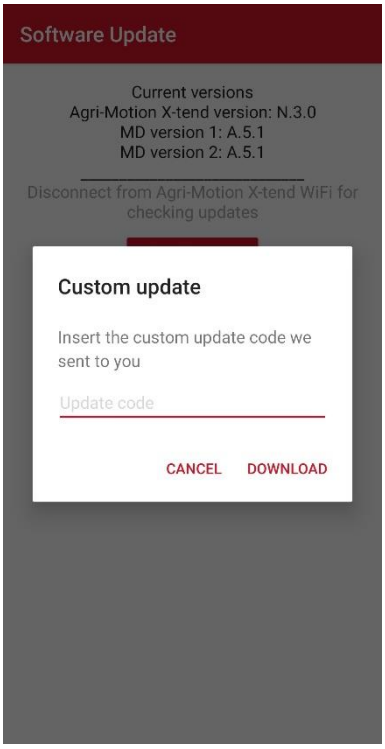




**Picture 3-32 Software update sequence**

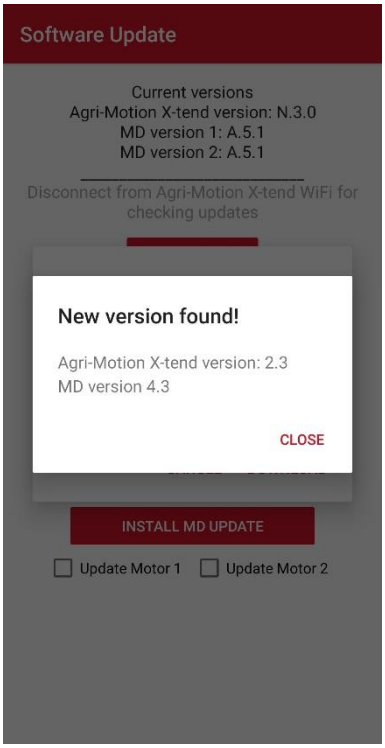
7. Using the “Custom Update” button (Picture 3-33) you will be able to check if dedicated versions for the AP and MD are available on the network.
   You will be prompted to enter the code (Picture 3-34) in order to check if they are available.
   If they are available, they will be displayed on the screen (Picture 3-35) and you will be asked if the update refers to the AP or MD; in the latter case you will have to indicate which motors to update (Picture 3-36), and then continue as described in the previous paragraphs related to SW.



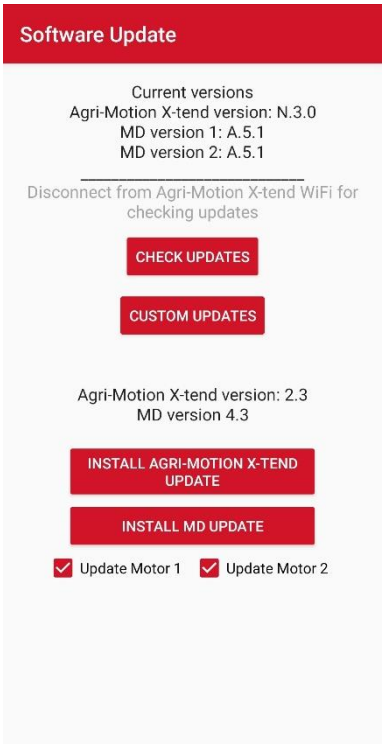

**Picture 3-33 Software update**




**Picture 3-34 Custom update**



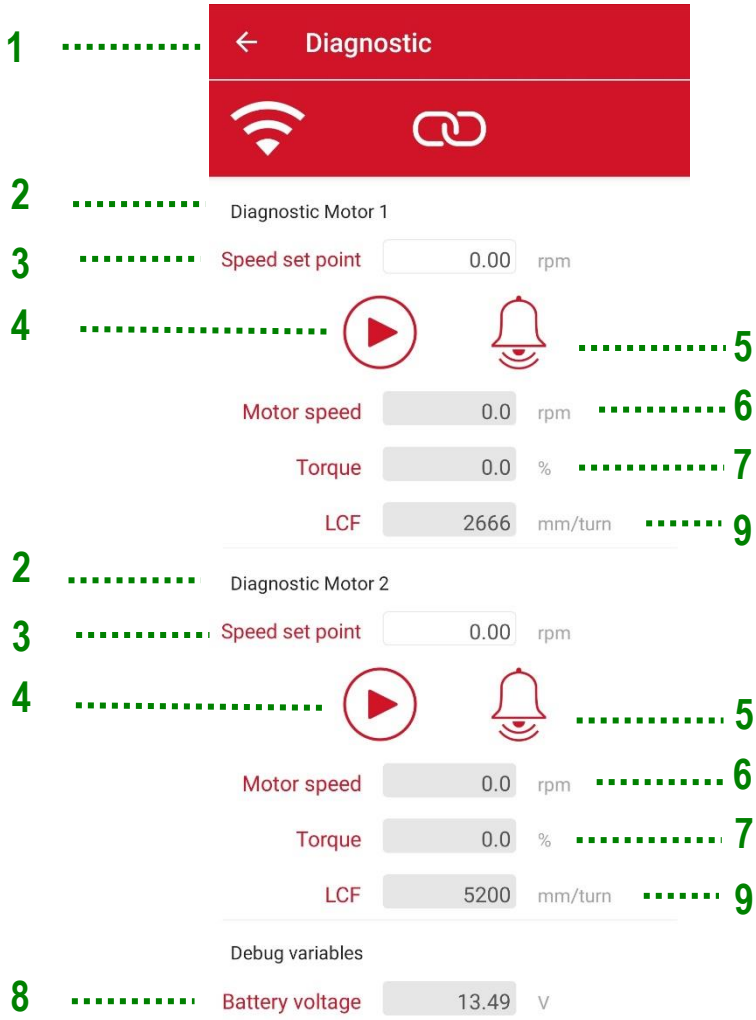

Picture 3-35 Update versions found




Picture 3-36 Software updates: motor selection

### 3.4.12. Diagnostics

The diagnostics page allows you to check the relevant parameters and is very useful for verifying the mechanical installation and debug.




**Picture 3-37 Diagnostics**

| Field | Function | Description |
|---|---|---|
| 1 | Back | If pressed, it allows you to go back to the main page. |
| 2 | Motor selection | It indicates the motor which to run diagnostics for. The next items refer to the selected motor. |

| Field | Function | Description |
|---|---|---|
| **3** | Speed to be set | Specify the motor desired speed in rpm on the distribution shaft (takes into account the geared motor and the additional transmission ratios set on the relevant page). |
| **4** | Start/Stop button | Starts/Stops the motor. If started, the motor runs at the set speed (point 3).<br>If the specified motor speed is higher than the rated motor speed, the motor will self-limit to the maximum possible speed in working conditions. |
| **5** | Error button | The same button found on the main page. See chapter 3.3.2 (num. 12) |
| **6** | Motor speed | Current speed of the final element of the drive chain (takes into account the geared motor and the further gear ratios set in the relevant page). |
| **7** | Torque | Engine torque in % compared with the rated torque. E.g., 50% indicates that the motor is operating at half its rated torque. |
| **8** | Battery voltage | Measured voltage at the motor input [V] |
| **9** | LCF | Linear Conversion Factor (debug parameter) |

## 3.5. ALARMS

The following chapter includes a list of alarms/errors that can be generated by the Agri-Motion X-tend kit along with a possible solution to the error.

x = motor number

| Code | Description | Solution |
|---|---|---|
| **x-**1 | **Motor x** - over current | Cycle power of the system from battery disconnect. |
| **x-**2 | **Motor x** - Motor high temperature warning | Let motor cool down. Inspection to check the presence of worn mechanical parts, unwanted frictions, damaged bearings, etc. |
| **x-**4 | **X motor** - Safety switch open | Close safety switch on motor cable |
| **x-**8 | **X motor** - Motor temperature too high | Let motor cool down. Inspection to check the presence of worn mechanical parts, unwanted frictions, damaged bearings, etc. |
| **x-**16 | **x motor** - Blocked distributor | Check distributor of stuck/blocking product |
| **x-**32 | **x motor** - High voltage | Check battery connection and fuses |
| **x-**64 | **x motor** - Low voltage | Check battery connection and fuses |
| **x-**128 | **x motor** - Low voltage warning | Check battery connection and fuses |
| **x-**256 | **x motor** - PCB high temperature | Let motor cool down. Inspection to check the presence of worn mechanical parts, unwanted frictions, damaged bearings, etc. |
| **x-**1024 | **x motor** - Blocked motor | Let motor cool down. Inspection to check the presence of worn mechanical parts, unwanted frictions, damaged bearings, etc. |
| **x-**4096 | **X motor** - PWM control voltage | Cycle power of the system from battery disconnect Contact supplier if not solved |
| **x-**16384 | **x motor** - AP heart beat missing | Check AP cable connection. Check battery voltage |
| **x-**32768 | **x motor** - PCB high temperature warning | Let motor cool down. Inspection to check the presence of worn mechanical parts, unwanted frictions, damaged bearings, etc. |

## 3.6. USE OF THE APPS WHILE WORKING

When the system has been properly connected and configured, its use in the working phase is concentrated on the App main page.


**Picture 3-38 Main page**

1. Check on the top bar (1) that the App is properly connected and that no alarms are displayed (8).
2. Before starting, check that the lifting device is in top position and its icon (7), at the lower left, corresponds to  and the motors are stopped.
3. Set in the two motors tabs (3 and 4) the quantity of product to be delivered (5) in kg/ha or seeds/m, depending on the system configuration.
4. In case you want to record the job, do so with the appropriate contact (2).
5. Check that no motor has been manually disabled  in the motor tabs (3 and 4) so that it is ready to start.

6. When you are ready to start, lower the machine so that its icon (7) changes to  . At this point, once the machine starts its forward movement, the system begins to deliver the product.
   It is possible to check whether the motors turn if the ring around the motors button (6) turns to red as shown in the following picture  .

# 4. MAINTENANCE AND TROUBLESHOOTING

## 4.1. GENERAL INSTRUCTIONS ABOUT MAINTENANCE WORKS

Thanks to the inherent sturdiness of the Agri-Motion X-tend kit components, it is not required to carry out any particular preventive maintenance operations on the machine.
However, in order to guarantee high reliability levels and avoid hazard conditions, it is advisable to scrupulously read the instructions and warning listed hereunder.

***For safety reasons, all maintenance tasks on the power train must be carried out ONLY with the machine stopped and disconnected from the power supply, by qualified trained and experienced personnel, having a suitable experience and knowledge of the Agri-Motion X-tend equipment.***

***Properly clean the operating area before starting maintenance.***
***Do not use solvents!***

***All materials (such as lubricants, dirty clothes, filter elements) having an environmental impact that is necessary to eliminate after maintenance operations, must be disposed of according to applicable regulations.***

*Ensure that the access of unauthorized personnel to the working area IS FORBIDDEN during maintenance tasks.*
*At the end of any task, make sure that no used tools are left inside the equipment or into the electrical panel.*

## 4.2. ORDINARY PREVENTIVE MAINTENANCE TASKS TO BE CARRIED OUT BY THE OPERATOR

| Task | Frequency | Notes |
|---|---|---|
| Cleaning | Before long service intervals | If cleaning with a high-pressure washer, do not direct the jet towards connectors and seals. |
| Tightening check | Every year, after long periods of inactivity (for ex. at the beginning of the seeding season) | |
| Replacing geared motors oil | Not required | |
| | | |
| | | |

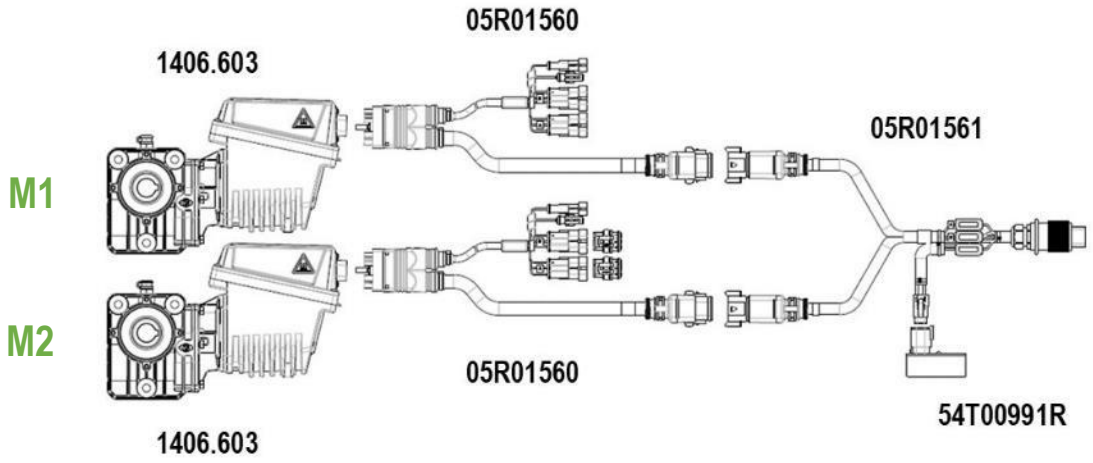
## 4.3. MAINTENANCE / REPAIR TASKS ONLY ALLOWED TO SPECIALIZED PERSONNEL

| Task | Frequency | Notes |
|---|---|---|

| | | |
|---|---|---|
| Check the safety devices operation | At the beginning of each season. During the seeding season depending on the use frequency | This can be checked by starting the motors, and verifying that when the safety contact of each MD is opened, the motor stops its movement. |
| | | |
| | | |

## 4.4. SPARE PARTS

### 4.4.1. Agri-Motion X-tend 2R kit

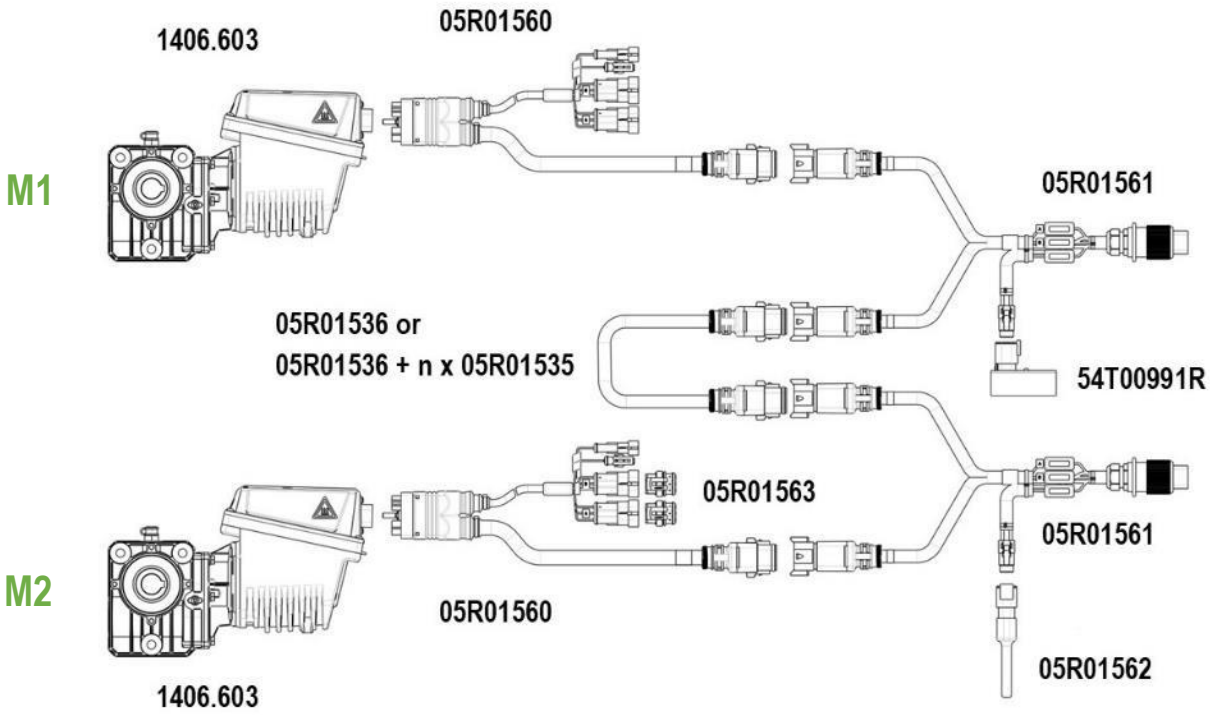



**Picture 4-1 Basic kit with codes**

| Code | Description |
|---|---|
| 1406.603 | DMD0 MOTORE |
| 54T00991R | PCS W1/X-tend AP |
| 05R01560 | DMD X-tend CABLE |
| 05R01561 | ISO12369 Y X-tend CABLE |

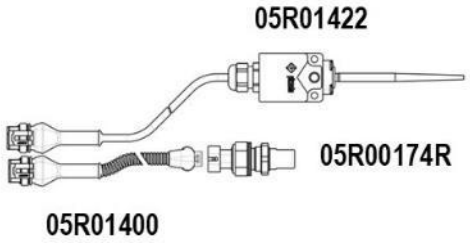
### 4.4.2. Agri-Motion X-tend 2F/R kit

This kit includes Agri-Motion X-tend 2R with the addition of a set of cables allowing the installation of a motor at the front and another motor at the rear of the tractor.



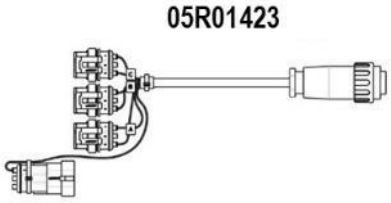

**Picture 4-2 Kit for two different applications with codes**

| Code | Description |
|---|---|
| 1406.603 | DMD0 MOTORE |
| 54T00991R | PCS W1/X-tend AP |
| 05R01560 | DMD X-tend CABLE |
| 05R01561 | ISO12369 Y X-tend CABLE |
| 05R01535 | M/F CABLE EXTENSION MOTOR |
| 05R01536 | M/M CABLE EXTENSION MOTOR |
| 05R01562 | X-TEND CAN LINE END PART |
| 05R01563 | CLOSURE PLUGS FOR DMD X-tend CABLE ENTRY |




**Picture 4-3 Option 1 with codes**

| Code | Description |
|---|---|
| 05R01422 | MACHINE POSITION SENSOR |
| 05R01400 | GS102301 SPEED SENSOR CABLE L=2000mm |
| 50A00174R | HALL EFFECT SPEED SENSOR GS102301 + NUT |




**Picture 4-4 Option 2 with codes**

| Code | Description |
|---|---|
| 05R01423 | SIGNAL CABLE-ISO11786 DMD |


**Picture 4-5 Option 3 with codes**

| Code | Description |
|---|---|
| 05R01422 | MACHINE POSITION SENSOR |
| 05R01516 | ATLAS 100 GPS ADAPTER CABLE |
| 46701651 | ARAG ATLAS 100 GPS SPEED SENSOR WITH CABLE |

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