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SMART-TAG

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Summary

SMART- TAG

Lifting TAG

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SMART-TAG Lifting

1. Description

The lifting SMART-TAG is an electronic device that will be installed on dumping sugarcane trailers. The smart tag will be able to identify, based on pre-established variables, the inclining angle variations of the wagon, during the lifting process. Once these variations are detected, the device sends a data package via radio frequency that reports an ID (identifier) and the movement status. The radio frequency system of the Lifting TAG will transmit only during the wagon lifting process.

It is important to highlight that the TAG will be installed outside the machine cabin, in order to avoid any contact with the operator.

TECHNICAL SHEET	
Transmission Frequency	433.100 MHz
Modulation Scheme	FSK
Maximum Power Transfer	-20 dBm em 433.100 MHz
Transmission Bandwidth	50 kHz
Baud rate	9600 bps
Operation Current Transmission	17 mA
Standby Current	1.5 uA
Type of Supply	Bateria de LITHIUM 3V 1Ah tipo 1/2 AA
Amount of time and transmission	10 transmissions of 10 ms each, a total of 100 ms
Maximum Amount of Daily Transmission	100
Maximum Operational Temperature	-140° F to +185°F
Type of Antenna	Onboard omnidirectional
Antenna Gain Pattern	-3 dBi
Dimensions of the Product	65mm x 50mm x 42 mm
Mechanical Fixation of the PCI	Polyurethane resin Aliphatic Bi-component
Approximate Weight	60 g



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2. Image of the Product



Front View



Bottom View



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3. Image of the PCB



Top Layer



Bottom Layer



4. Installing Instructions

The device will be fixed on the wagon as close to the cabin as possible, since there, it is located the signal receiver responsible for collecting all the data sent by the device. As you can see in image number 1. In the specific case of the wagon, the device will be installed with the bottom base in upward position, and the wavy surface directed to the cabin.

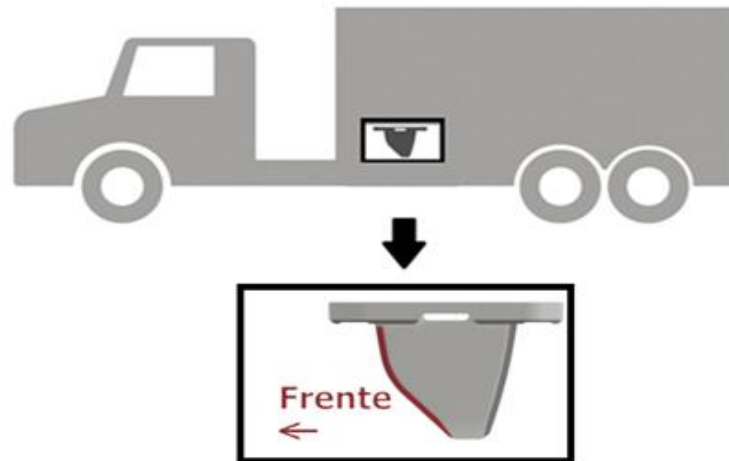


Image 1: Correct Fixation of the Smart Tag, in the case of the wagon.

On the implement, the device will be installed with its base facing the floor and the wavy surface directed to the tractor cabin.

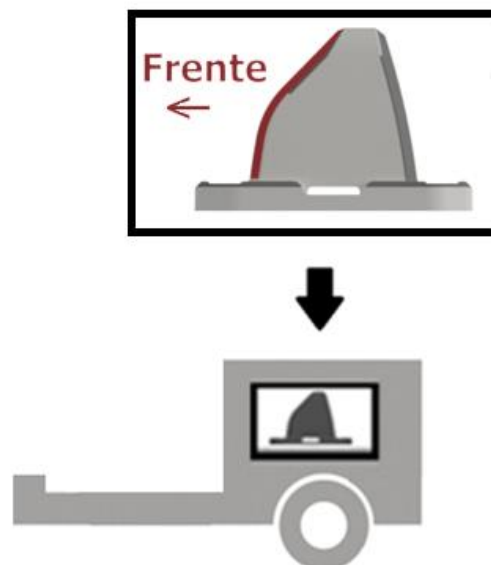


Image 2: Correct Fixation of the Smart Tag, in the case of the implement.



Note: To ensure the correct functioning of the device, it is of paramount importance to follow the previous explanation of the installation process. Considering, the former images and the fact that, no metallic barrier should be close to the device.

The device must be fixed using two rivet nuts previously inserted on the implement or the wagon metallic structure. To guarantee the success of the process and the long-term stability of the device, it is necessary to follow the next steps:

- I.** First, drill the metallic structure using a 2mm drill to warrant a greater precision of the drilling point. Next, use a 5mm drill and; finally, for the last diameter use a 7mm drill.
- II.** Install the rivet nuts using the compatible tool. (compatible tool for rivet nut 5mm).
- III.** Apply adhesive anaerobic threadlockers on both bottom head Allen screws 5x25 mm.
- IV.** Fix both screws mentioned on step number 3 using an 3mm Allen wrench. The screws should not be tightened excessively to avoid any damage on the plastic structure of the device. The adhesive anaerobic threadlockers role is to prevent loosening due to vibration.
- V. Battery**

The TAG has an intern battery of long durability; therefore, it doesn't need any type of external energy supply

-Industrial Lithium Battery 3V.

VI. Impermeability

The Smart Tag high water and mechanical resistance feature is extremely relevant since it protects the device electric circuit from adverse weather conditions such as rain and dust.

VII. Communication

The device communicates via radio frequency with it respective receiver in open spaces and long distances. However, once on the field, there can be some communication losses due to imposed barriers between the device and the receiver.



5. TAG Implement

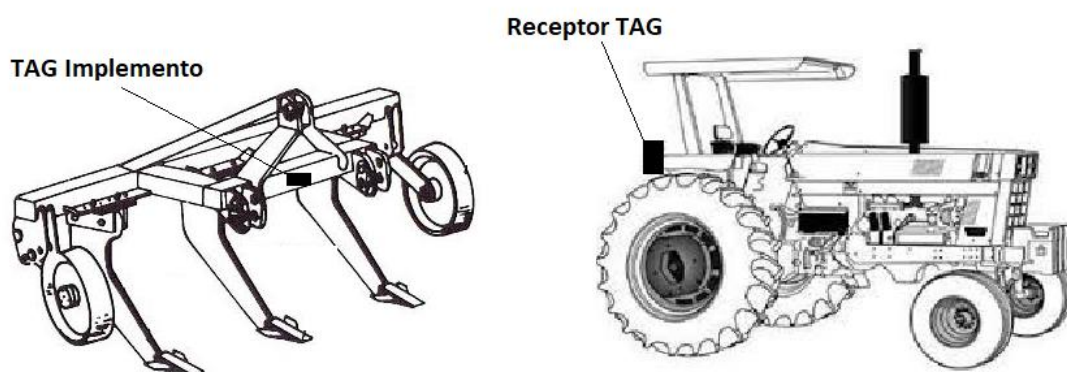
5.1 Funtioning

The main objective of the Tag Implement Project is to automatically register the productive operation by means of the wireless communication implement recognition

Each Tag will send a wave to the receiver carrying its identification (ID) and signal level. Then, the receiver analyzes the data to identify which implement is closest to the tractor and consequently, attached to the machine. These are the benefits of the Tag Implement:

- Automatic recognition of the implement, decreasing the human interference in the process.
- Monitoring and Tracking of the implement.

Image 2 – Identifying TAG Implement





6. TAG Recognition

Once the implement is attached and the tractor starts moving, the implement will be identified automatically.



7. – Operation Integration

The system verifies which productive operation is linked to the Tag and registers it automatically.

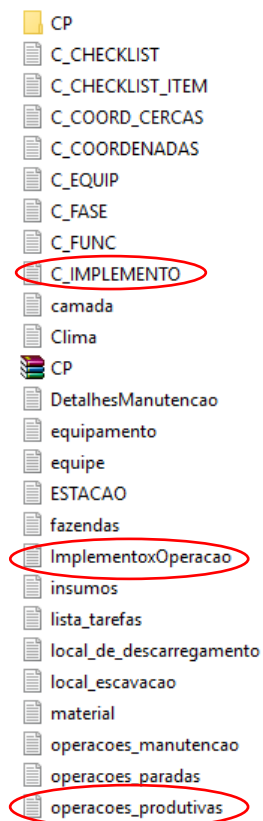




7.1 – Configuration Details

It is important to follow the next step for the best implementation of the device. In the case of the computer on board model MAG 100 tablet S7, is necessary to configured some of the files inside the folder on the system screen:

- productive_operations
- C_implement
- ImplementxOperacion





7.2- Productive_ Operations

On the file productive operation must be registered:

- Productive operation code
- Productive operation description
- Reserved Field
- Reserved Field
- Reserved Field
- Special code for working time
- RPM for working time (-1 undetermined)
- Reserved Field
- Operation minimum speed
- Operation maximum speed

EX: 1011; INTERMEDIATE LEVEL; N;N;N;5;-1;N;Y;Y

7.3- C _Implement

On the File C_ implement must be registered:

- Implement Code
- Implement description
- Distance to the implement
- Torque
- ID of the TAG Implement note: It will be possible to visualize the tag id on the device.
- Productive operation code
- Maximum width
- minimum width

EX: 243; IMPLEMENT;10;0;899;199;2.8;6.1



8. – Implement X Operation

On the file Implement X Operation enter the following information:

- In which machine will be installed the TAG.
- Productive Operation assigned to the implement.

Ex: 234;1011

Once all the necessary modifications have been done, the register folder on the S7 tablet must be updated too.

3 – SGPA

After the TAG is identified the number of the machine and implement will be sent altogether with the monitoring KIJO. Therefore, it will be possible to monitor the device from the SGPA



REQUIREMENTS

COMPUTER ON BOARD

FIRMWARE

APP

Same or above

MAG 100 Tela S7

TPL 17.36

2.8.0



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This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and**
- (2) this device must accept any interference received, including interference that may cause undesired operation.**

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.**
- Increase the separation between the equipment and receiver.**
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.**
- Consult the dealer or an experienced radio/TV technician for help.**