Technical Manual Board Computer Model MAG-100R

Sumário

1. Mechanic Characteristic

1.1. Technical Characteristic

Width (mm) x height (mm) x comprimento (mm)	**73 mm x 33 mm x 165 mm**
Box material	ABS (plastic)

a) Feeding of 12 – 35 volts
b) Four digital input 0-30 volts
c) Two digital output 0-30 volts
d) Three analogue input 0-10 volts,4-20 mA
e) Two pulse input (RPM and pulse)
f) One serial port (RS 232)
g) GRPS,3G Communication
h) Communication Zigbee (mesh net) 7 km/ 35 km (optional)
i) Communication Bluetooth (optional)
j) Optional – Canbus parameters reading (it depends on the vehicle model)
k) Global Positioning System (GPS)
l) Removable storage system (Intern Compact flash, up to 2gb)
m) IP66

The Mag100R has an internal battery (optional), that works as a backup, with a minimum autonomy of 2 working hours, if it were unplugged from the main battery. It is important to highlight that; this machine is out of the operator's range and all the antennas are external.

Storage Temperature	**0 - 50°**
Relative Humidity	5 – 85%

1.2. GPRS, 3G Communication

Figure 1 - Module HE910 - D

Module HE910-D Made by TELIT.
Address: Via Stazione di Prosecco, 5/B, I-34010 Sgonico(Trieste), Italy,
Zip Code: 34010

Telephone: +39 040 4192, Fax: +39 040 4192 333
Information Contact and technical assistance.
TS-EMEA@telit.com
TS-AMERICAS@telit.com
TS-APAC@telit.com
TS-SRD@telit.com
Alternative Use: http://www.telit.com/support
Official Page: http//www.telit.com

1.3. Characteristics

- 4 range GSM/GPRS/EDGE: 850/900/1800/1900MHz
- 3 range UTMS/HSPA: 850/900/2100MHz
- WCDMA Multi-band (I, II, IV, V, VI, VIII and XIX)
- HSDPA up to 21.0Mbps (high range; up to 7.2 Mbps for other)
- HSUPA up to 5.76Mbps
- WCDMA 384kbps downlink/uplink
- DTM (double transfer module)
- Reception Diversity, tipo3i Interference Canceling Receptor
- CPC (DRX/DTX) (Continuous package connection)
- Control using AT according with 3GPP TS27.005, 27.007 and other Telit modules.
- Multiplexed serial port 3GPP TS27.010
- SIM card interface 1.8/3V (Automatic detection 3GPP TS 51.014)

Power Consumption (Conventional Values)
- Quiescent current -by 2G, DRX5, 1.1 mA
- Stand-by current- 3G, DRX7, 1.2 mA

Transmission Power:
- Class 4 (2W) @ 850 / 900 MHz, GSM
- Class 1 (1W) @ 1800 / 1900 MHz, GSM
- Class E2 (0.5W) @ 850/900 MHz, EDGE
- Class E2 (0.4W) @ 1800/1900 MHz, EDGE
- Class 3 (0.25W) @ 850/900/1700/1900/2100 MHz

Sensitivity Reception:

- GSM 850/900MHz - 109 dBm
- GSM 1800/1900MHz - 110 dBm
- WCDMA 850/900/1700/1900MHz - 111 dBm

1.4. Data Transmission:

- HSPA: category 14 in downlink and category 6 in uplink
- DL to 21.0Mbps
- UL to 5.76Mbps
- WCDMA: to 384kbps downlink/uplink
- EDGE: DL to 296kbps, UL to 236.8kbps
- GPRS: DL to 107kbps, UL to 85.6kbps
- GPRS class 10 to Global and variables NAx; class 33 for variables EUx
- EDGE class 10 for Global and variables NAx; class 33 for variables EUx

- Not transparent asynchronous CSD up to 9.6kbps
- Code outline from 1 to 4 (GPRS) and codification outline module from 1 to 9 (EDGE)

Antenna Perform	
Frequency	880 – 1600 mhz
Efficiency	82%
Impedance	50 ohm
Irradiation	Omnidirectional
Polarization	Lineal
Temperature of the Operation	0 - 85°

FCC ID: RI7 HE910
FCC REGISTER NUMBER (FRN): 0020384608

1.5. Communication XBEE

Figure 2 - Module XBEE-PRO S3B

Module XBEE-PRO 900HP S3B Made by Digi International.
Address: 11001 Bren Road East
Minnetonka, MN 55343
Telephone: 1-877-912-3444
Telephone :952-912-3444
Fax: 952-912-4952
Technical Support.
Telephones: (866) 765-9885 toll-free U.S.A and Canada
(801) 765-9885 Worldwide
Online Support: www.digi.com/support
Email: tech.support@digi.com

The RF Xbee-pro 900HP is ideal for smaller power consumption, from point to multipoint on low latency net application. It is used on peer to peer and net from point to multiple point. The XBee-900 module has a higher selectable transmission power of 250 mW. This higher Tx power allows a line-of-sight range up to 28 miles with antenna right. This one is ideal for situations in which the RF penetration and absolute transmission distance are of extreme importance for the implementation.

As part of the RF XBee line, this module is easy to use, includes drop-in gateways nets, and uses Digi and Adapters. The RF does not need any out-of-the-box configuration and any necessary advance configuration can be replaced with simple commands.

1.6. Characteristics:

Processor: transceiver ADF7023, Cortex-M3 EFM32G230 @ 28 MHz
Includes Programmable: Freescale MC9S08QE32
Frequency range: 902 to 928 MHz, selectable software for the interference resistance.

Frequency Intervals, Power and Type of Modulation

Frequency Interval Tx (MHz)	Output Maximum Power (W)	Emission Designation	Technology	Type of Modulation
920.0 a 928.0	0.23878	290KF7D	LEAP IN FREQUENCY	FSK
902.0 a 907.5	0.20701	255KF7D	LEAP IN FREQUENCY	FSK
902.0 a 907.5	0.24266	360KF7D	LEAP IN FREQUENCY	FSK
915.0 a 928.0	0.20701	255KF7D	LEAP IN FREQUENCY	FSK
915.0 a 928.0	0.24266	360KF7D	LEAP IN FREQUENCY	FSK

In the specific case of Peru, the modules were configurated to work on a 915,5 a 927,7 MHz frequency, setting the **cm** register (Channel Mask) with a value of FFFFFFFE**00000000**, that same value is defined during the production of mag-100R and it is storage on the inter flash of the XBee 900-HP.

The starting process of the Mag-100R is configured following the next steps. If the XBee 900-HP radio module is changed, then the correct configuration is ensured.

1.7. Characteristics of the XBee 900-HPS3B for Peru

- Working Frequency: 915.5 MHz to 927.7 MHz
- Channels: 31
- Main Frequency of the main channel: 915.600 MHz
- Channel division: 400 kHz

- Transmission range length: 200 kHz
- Modulation: GFSK
- Channel Leap: Yes (pseudo-random)
- Maximum Power Transmission: 24 dBm (250 mW)
- Baudrate on the air: 200 kbps
- Sensitivity: -101 dBm

1.8. Data Transmission

- Data Speed: RF: 10 Kbps o 200 Kbps
- Interior/Urban range: 10 Kbps: to 2000 feet (610 m); 200 Kbps: to 1000 feet (305 m), outdoor/Line-Of-Sight Range: 10 Kbps: to 9 miles (14 km); 200 Kbps: to 4 miles (6.5 km) (w/2.1 dipole antenna dB)

1.9. Transmission Power:

- to 24 dBm (250 mW) selectable by software

Receptor Sensitivity:
- -101 dBm a 200 Kbps,
- -110 dBm a 10 Kbps

Interface
- Data Interface: UART (3 V), SPI
- GPIO: to 15 E/S Digital, 4 adc input of $ number bits, 2 PWM outputs
- Network Topology: DigiMesh, repeater, point to point, peer to Multipoint, Peer-to-Peer
- Spread Spectrum: FHSS (Selectable Channel Software)

Program Capacity
- memory: N/A 32 KB
- CPU/Clock Speed: N/A

Feeding Tension
Feeding Tension 2.1 a 3.6 V CC C
Current in transmission 215 mA typical (290 mA max)
Current in reception 29 mA typical a 3.3V (35 mA max)
Current Sleep 2.5 uA typical
Temperature on the Operation -40 ºC to 85 º C (industrial)
Physical Property
Weight: de 5 a 8 g depending on the antenna option
Size: 3.3 cm x 2.5 cm (4.5x2.5 cm with connector)

Antenna Performance	
VSWR	<= 2,0 : 1
Maximum Power	20 Watts
Impedance	50 ohm
Irradiation	Omnidirectional
Earnings	6 dBi

Homologated by countries:

Country	Approved
United States (FCC Part 15.247)	MCQ-XB900HP
Industry Canada (IC)	1846A-XB900HP
Australia	RCM
Brazil	ANATEL 3727-12-1209
Singapore	License No. DA105737 (XB900HP only)
Mexico	IFETEL (XB900HP only)
RoHS2	Compliant

FCC ID: MCQ-XBPS3B
FCC REGISTER NUMBER(FRN): 0010283307

1.10. GPS MODULE MADE BY UBLOX

Figure 3 - LEA-6S Module

Model LEA-6S
Contacts
HQ Switzerland: +41 44 722 7444 info@u-blox.com
America +1 703 483 3180 info_us@u-blox.com
APAC – Singapore +65 6734 3811 info_ap@u-blox.com
China +86 10 68 133 545 info_cn@u-blox.com
Taiwan +886 2 2657 1090 info_tw@u-blox.com

- U-blox 6 position engine:
  - Navigate up to-162 dBm and-148 dBm coldstart
  - Faster Acquisition with AssistNow Autonomous

    - Configurable energy Management
    - Hybrid gps/sbas (waas, egnos, msas)
    - Anti-jamming Technology
- Simple Integration with unwired u-blox modules
- A-gps: AssistNow ON-LINE and off-line AssistNow services, OMA SUPL compliant
- Compatible (hardware and firmware); easy migration to LEA-5 or LEA-4 family
- LCC package for trustable manufacture and effective cost
- Compatible with u-blox GPS for Android
- Based on the GNSS chips qualified according to the aec-q100
- Made on iso/ts 16949 production facility
- Qualified according to ISO 16750

Hot starting and initial auxiliary position for the first time in less than a second.
Tracking capture and sensitivity of 160dBm
Kickstart function, the model can attain an acceleration when the signal level is low at the beginning.
GPS, Galileo, SBAS (WAAS and EGNOS and MSAS, and GAGAN) hybrid motor
4 Hz update range of the position.
Receptor with 50 channels, frequency L1 code C/A (1575 MHz).
Search sensitivity during navigation -162 dBm
Reacquisition sensitivity -160 dBm
Sensitivity on the cold starting without help -148 dBm.
Maximum Updating interval during navigation 5 Hz
Horizontal Position of without help precision 2,5 m e SBAS 2 m
Configurable interval frequency of leap-time 0,25 Hz a 1 kHz
Speed Precision 0,1 m/s
Orientation Precision 0,5 degrees
Operational Limits: Dynamic ≤ 4 g, Altitude 50,000 m , speed 500 m/s
Source tension 2.7 V – 3.6 V
Consumption of continuous potency 121 mW.
Consumption of potency on Save mode 36 mW.
Support of Antenna active and passive.
Serial Interface: 1 UART, 1 USB V2.0 full speed 12 Mbit/s, 1 DDC (I2 C compliant)

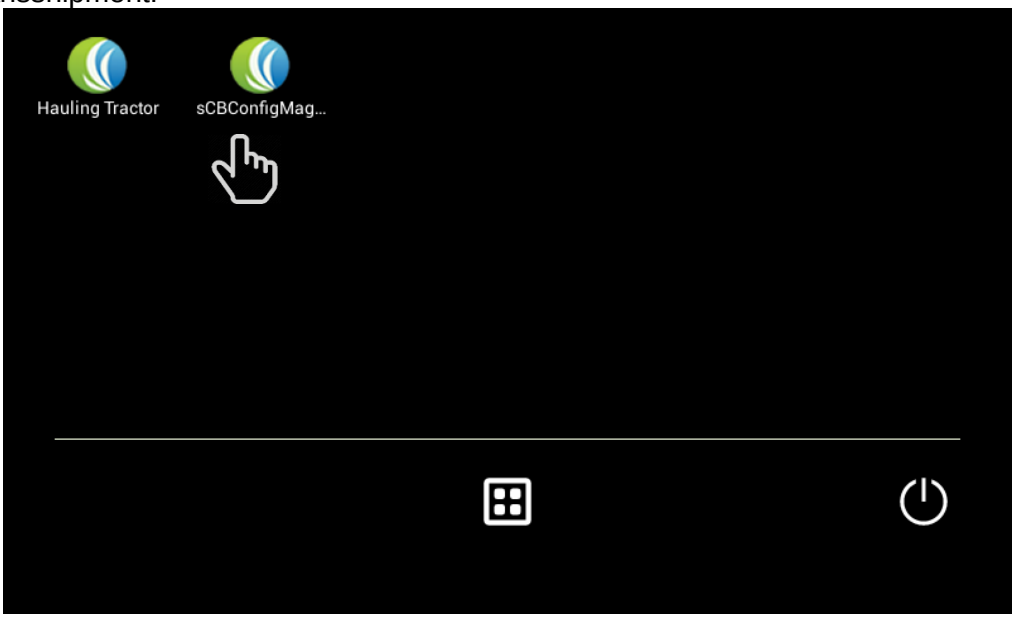
Antenna Performance	
Impendence	50 ohm
Central Frequency	1575.42 mhz
Range length	10 mhz
Earnings	27 db
Mitigation for output filter range (db)	Dielectric fo = 1575.42 mhz 7 typ. Fo +/- 20 mhz 20 typ. Fo +/- 50 mhz 30 typ. Fo +/- 100 mhz
Power Consumption	10 mA (max)

2. MAG-100 Transshipment Configuration.

2.1 APK sCBConfigMag100R

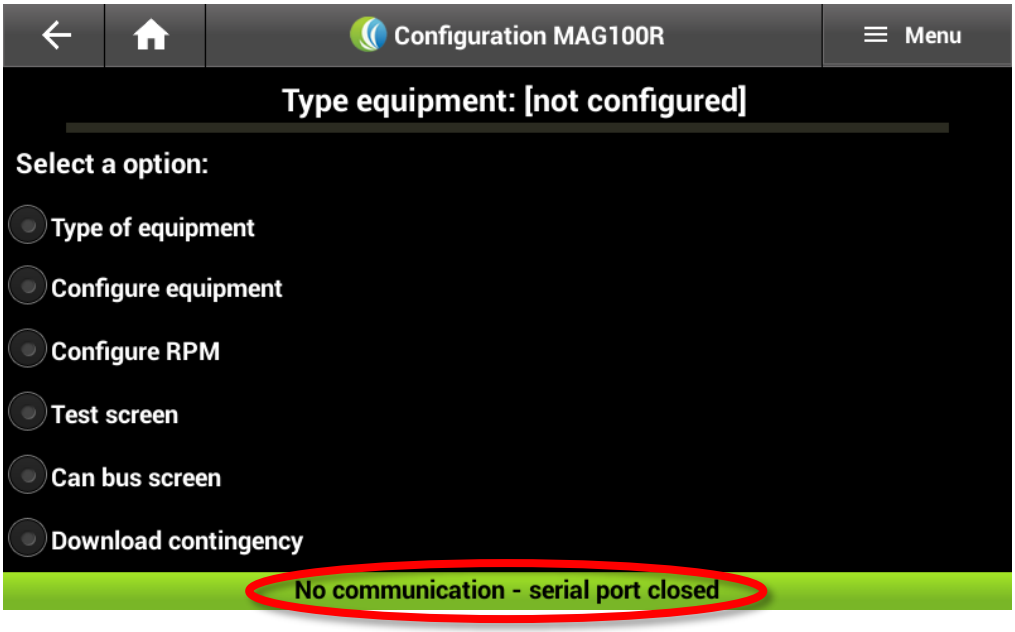
1.1.1. Open sCBConfig app.

The sCBConfig app is used for the initial configurations of the MAG100 in any machine. On this document, it is explained the configuration process of the Transshipment.



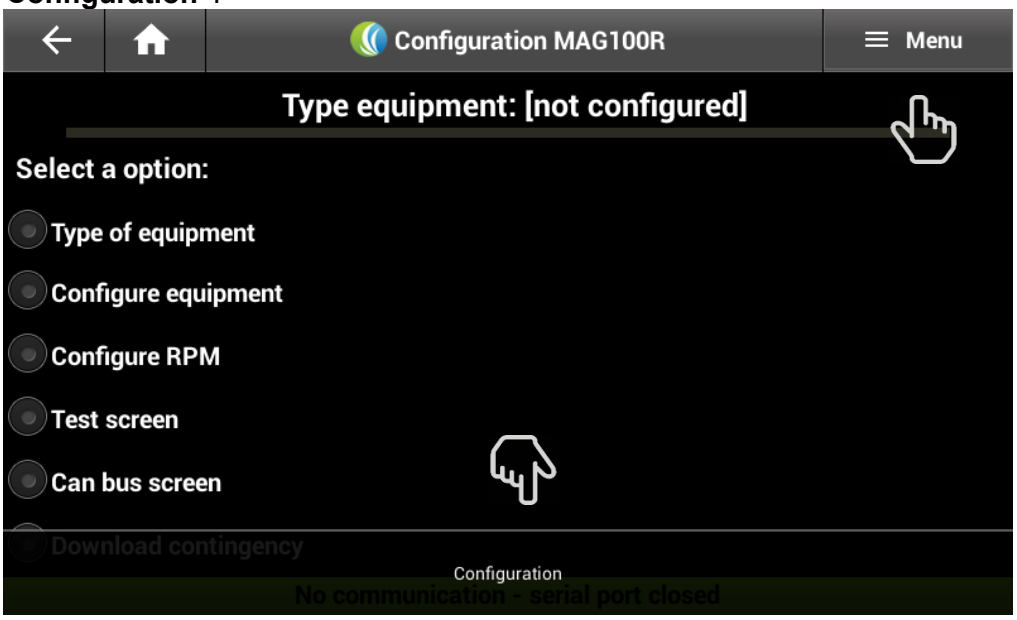
First, it must be selected the sCBConfigMag app.

Opening of the configuration serial port

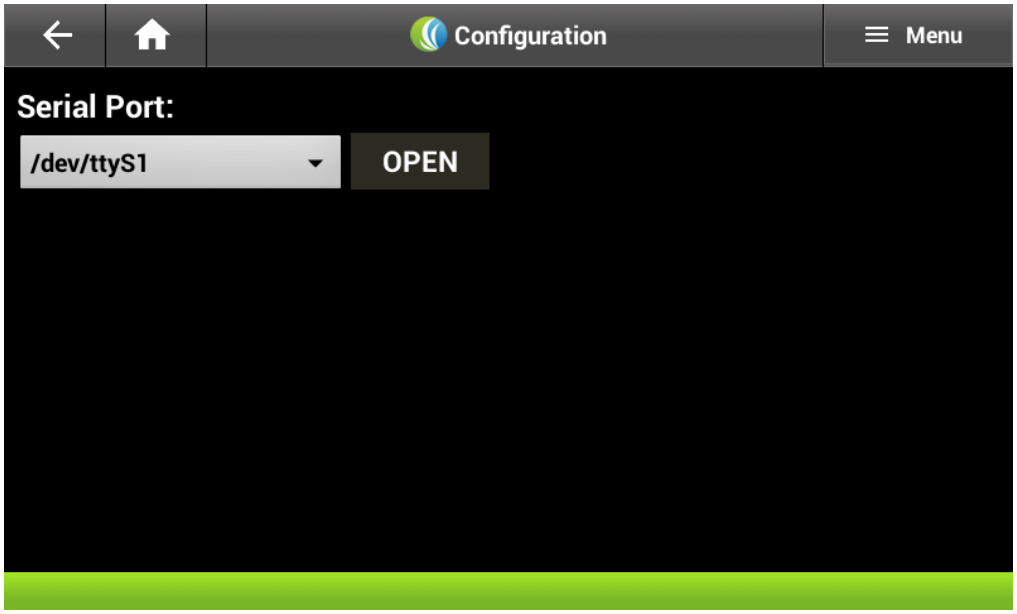


Each item on the screen will be explained one by one with all its functionalities. The configuration main screen by default has no machine configurated and has the serial port closed:

To enable the serial port, it is necessary to click on the “**MENU**”.
After, that a tab will appear on the lower part of the screen with the option of “**Configuration”**.

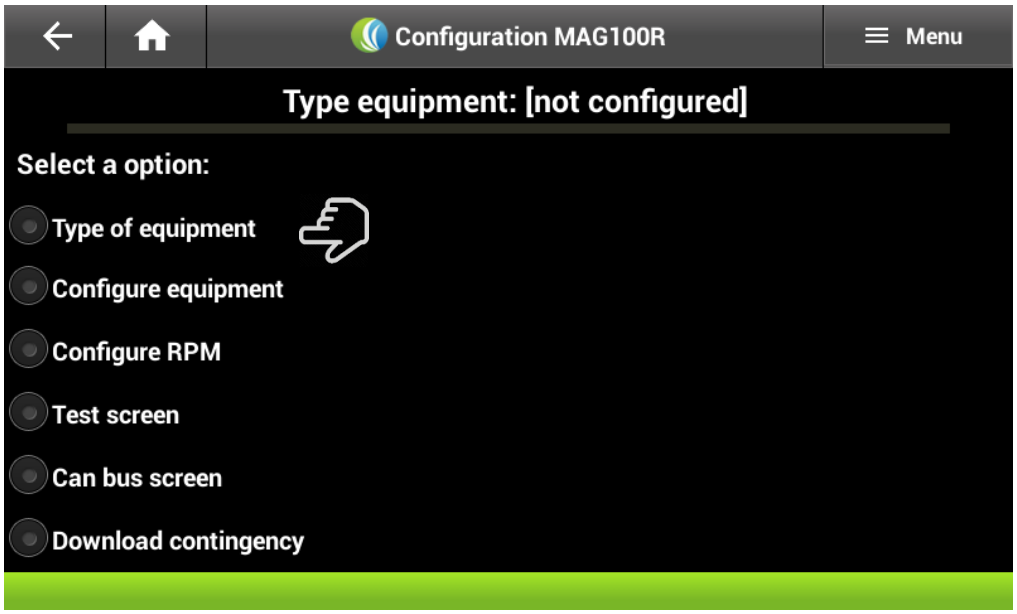


Once the Configuration option is selected, a portal serial tab will appear on the screen. Then, it is important to enter the valid address which is (**/dev/ttyS1**) and select the option **“OPEN”.** To return to the main screen click the “**BACK”** or “**HOME** bottom

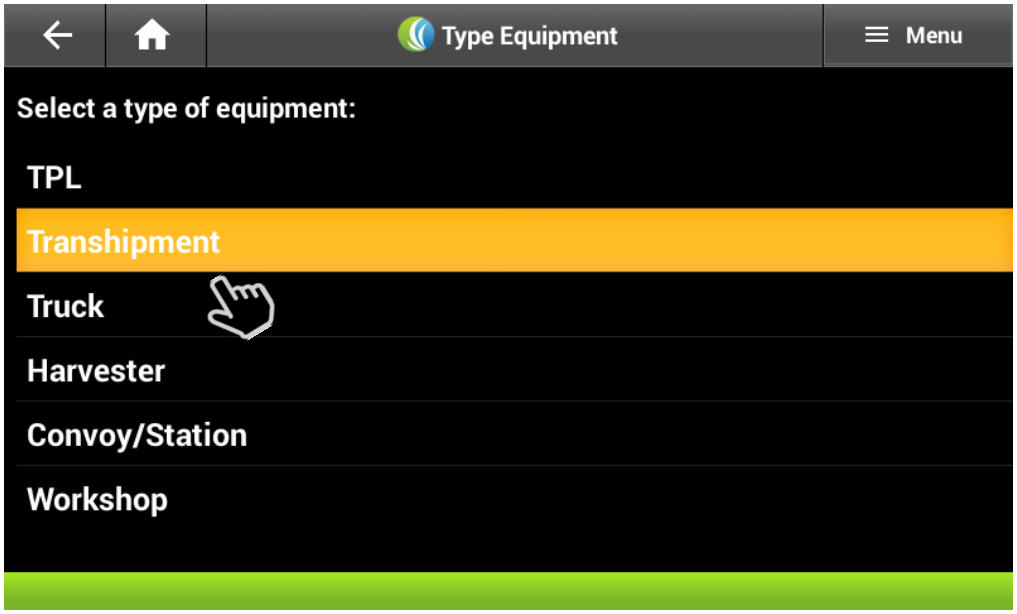


1.1.2. **Configuring type of equipment**

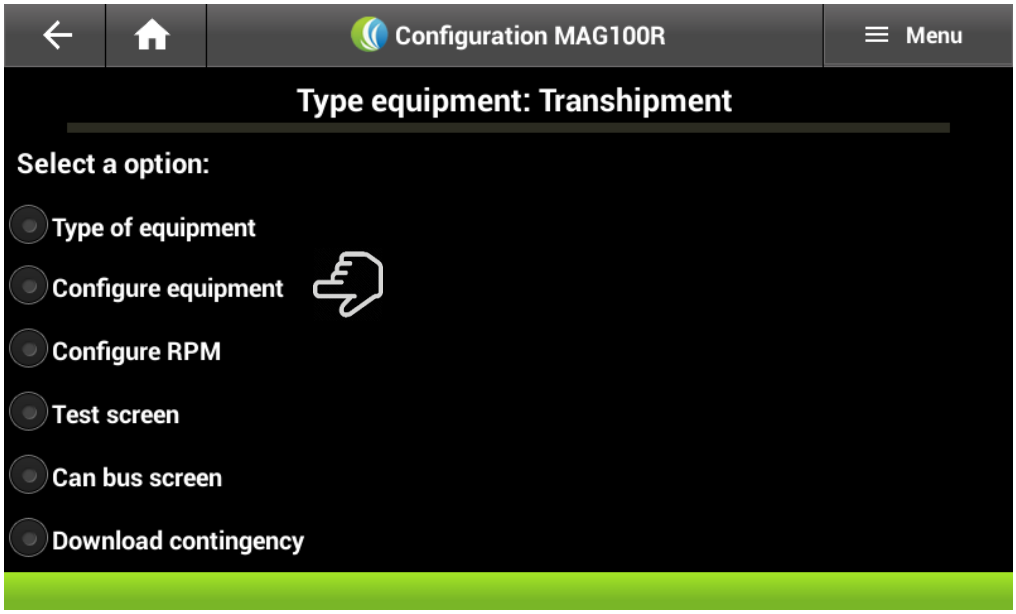
The first step on the configuration of the computer on board, it is to specify the type of equipment used on the option **“Type of Equipment”.**



In this case, the equipment will be "**Transshipment"**

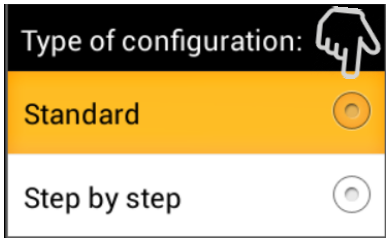


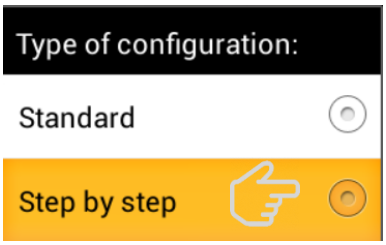
1.1.3. **Transshipment Parameters Configuration**



After that, the app will return immediately to the main screen. Then, the equipment can be configured

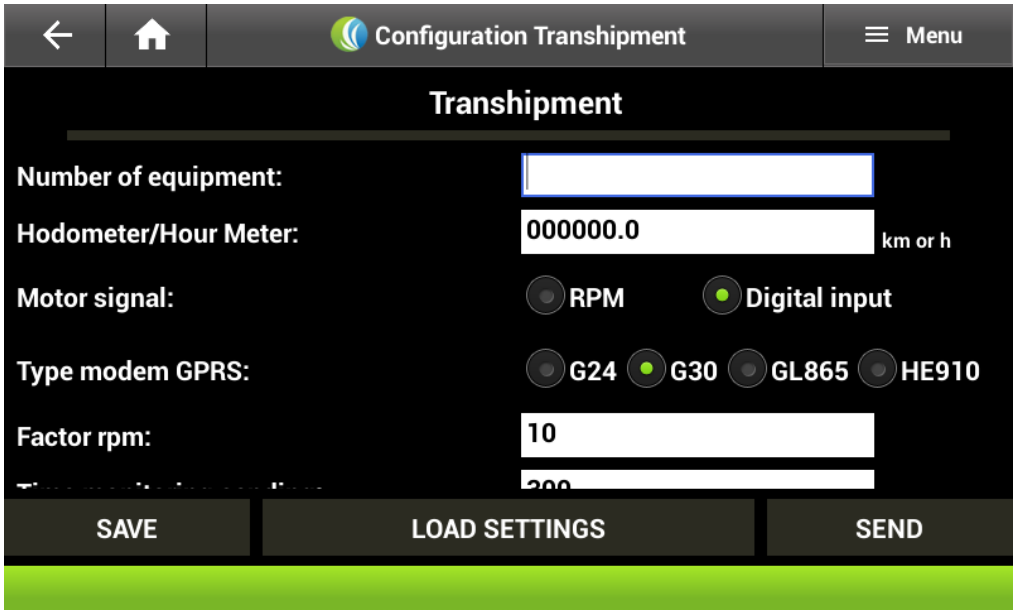
The desired setting can be selected:
Standard: There is complete freedom to change the parameters.
Step-by-Step: It will be changed a field at a time, on the following order.





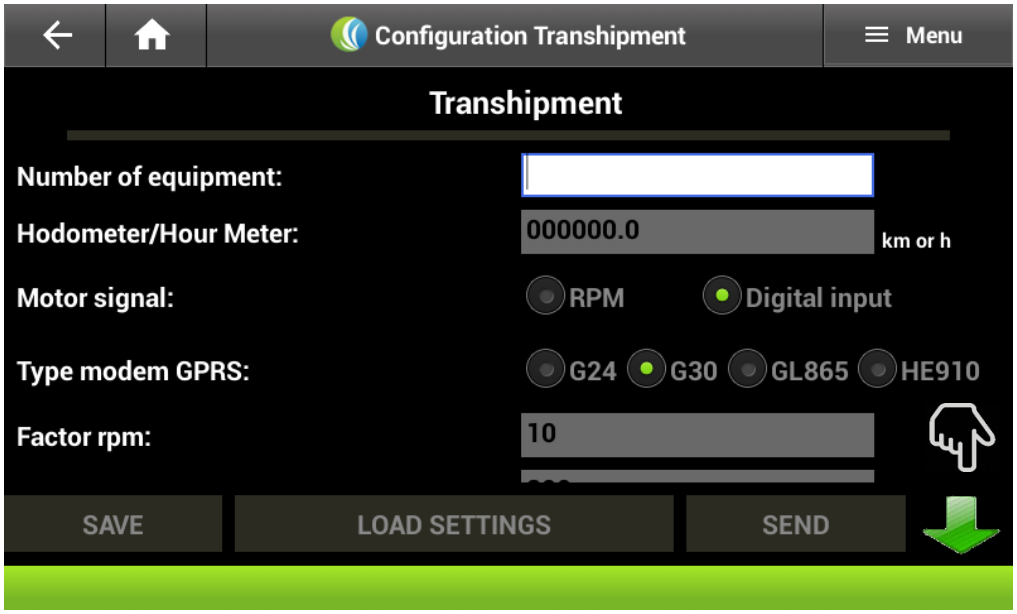
1.1.4. **Standard Setting:**

This option gives more liberty on the field selection. The desired option can be selected at any time and the virtual keyboard will appear to enter the data. To move around on the screen, it is just a matter of sliding the finger.

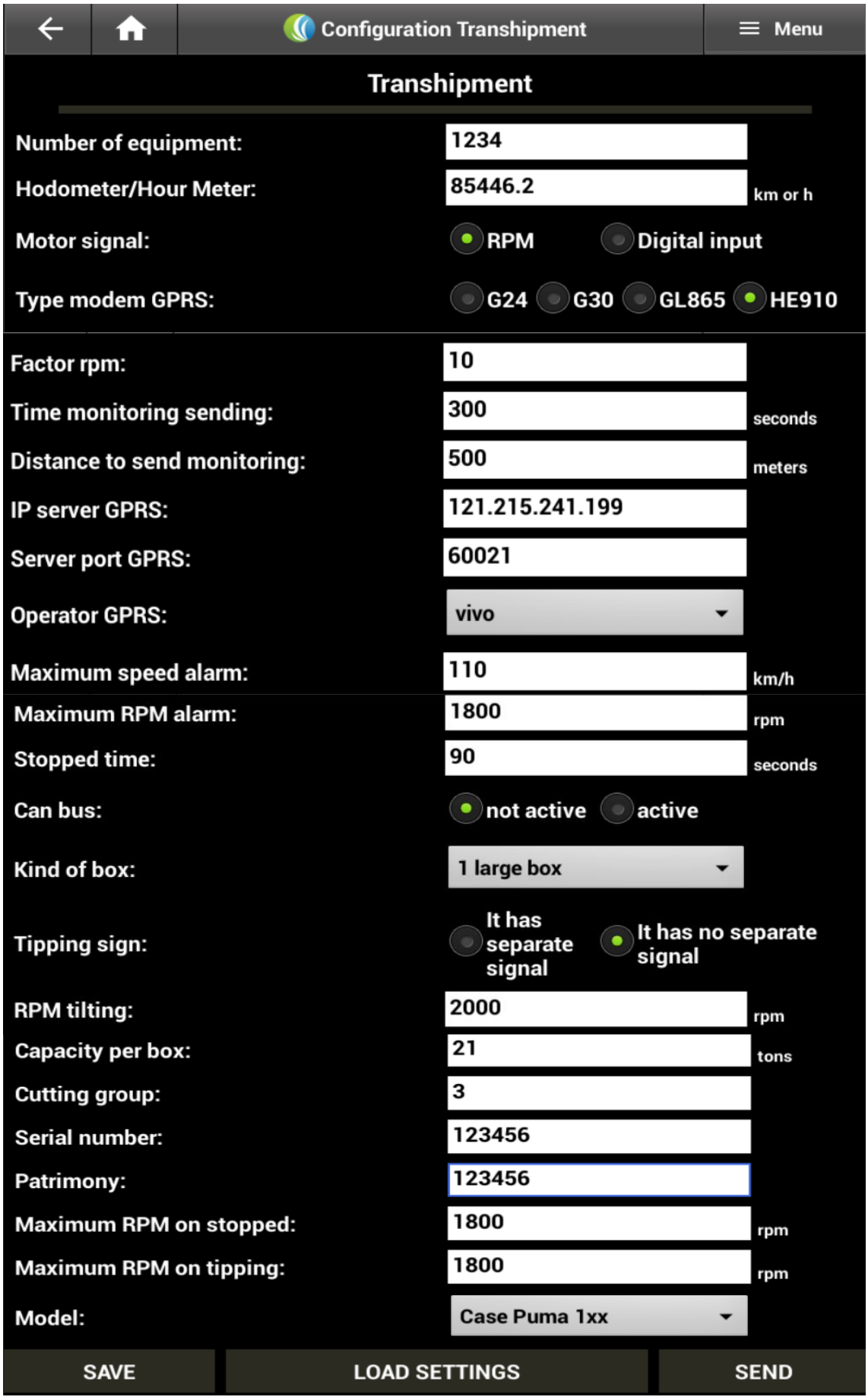


1.1.5. **Configuration Step-by-Step:**

In this case, it must be configured field by field following the order on the screen and changing them using the arrow highlighted on the image:



After that, it is necessary to make some changes which are explained in detail:


Configuration Transhipment
Menu
Transhipment
Number of equipment:
1234
Hodometer/Hour Meter:
85446.2
km or h
Motor signal:
RPM
Digital input
Type modem GPRS:
G24
G30
GL865
HE910
Factor rpm:
10
Time monitoring sending:
300
seconds
Distance to send monitoring:
500
meters
IP server GPRS:
121.215.241.199
Server port GPRS:
60021
Operator GPRS:
vivo
Maximum speed alarm:
110
km/h
Maximum RPM alarm:
1800
rpm
Stopped time:
90
seconds
Can bus:
not active
active
Kind of box:
1 large box
Tipping sign:
It has separate signal
It has no separate signal
RPM tilting:
2000
rpm
Capacity per box:
21
tons
Cutting group:
3
Serial number:
123456
Patrimony:
123456
Maximum RPM on stopped:
1800
rpm
Maximum RPM on tipping:
1800
rpm
Model:
Case Puma 1xx
SAVE
LOAD SETTINGS
SEND

Description of Fields

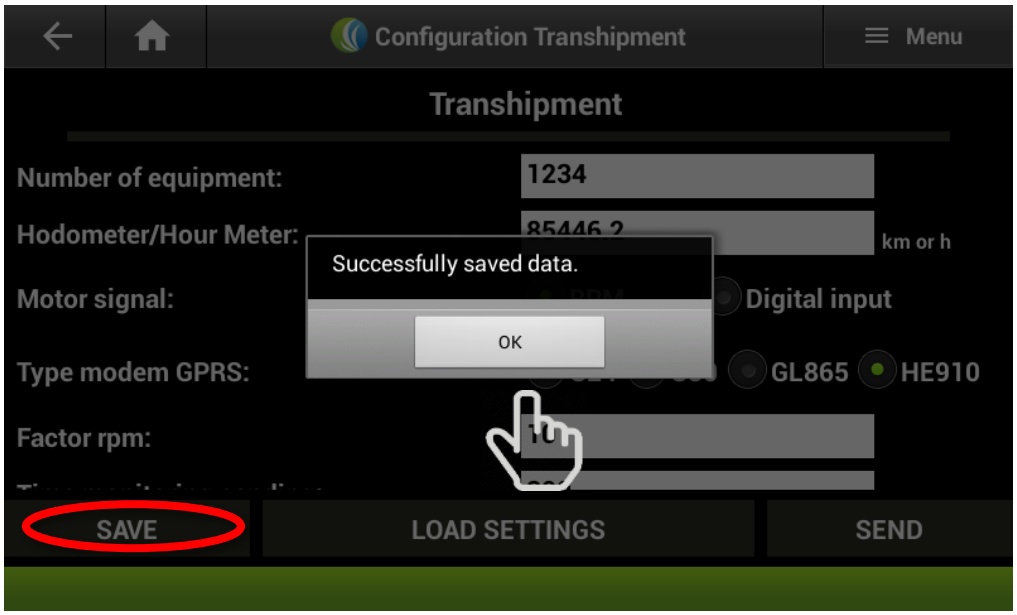
Machine Number	**Machine number registered by the farm.**
Odometer/Hour Meter	Odometer and Hour Meter (depends on the machine) usually on the transshipment panel analyzed by the CAN BUS network.
Engine Signal	RPM: Engine signal is measured by the alternator or the CAN BUS network. Digital Input: The engine signal is measured by the ignition point or (fixed RPM).
Type of Modem	Specify the type of hardware used (modem GPRS).
RPM Factor	It will be configured afterwards
Monitoring Sending Time	Time measured in seconds for the register of the monitoring.
Monitoring Sending Distance	Distance in meters for the register of the monitoring
IP server GPRS	IP of the server that will receive the CB info.
Server Port GPRS	The server port will receive the CB info.
GPRS Operator	Operator of the SIM card used on the transmission of the CB info.
Maximum Speed Alarm	If the Maximum speed is exceeded an alarm is generated and registered.
RPM maximum alarm	If the maximum RPM speed is exceeded an alarm is generated and registered.
Stop Time	If the Maximum time is exceeded, it will ask for a code with the reason of the stop.
Can bus	It enables or disables de Can Bus network.
Type of truck *	No configurated 1 small truck box 2 small truck boxes 3 small truck boxes 1 big truck box 2 big truck boxes 3 big truck boxes Small together Big together 2 middle truck boxes 2 extra big truck box
Overturning Signal	There is or not case selection (overturning signal)
Truck bed Capacity	Case capacity in ton.
Harvesting Code	Harvesting team machine code.
Serial number	Serial number fixed on the computer on board by Solinftec
Assets	Identity number of the computer on board fixed by the client
Maximum RPM Stop	Maximum RPM allowed to the machine when there is no speed
Maximum overturning RPM	Maximum RPM allowed to machine during overturning

Fields configuration detail

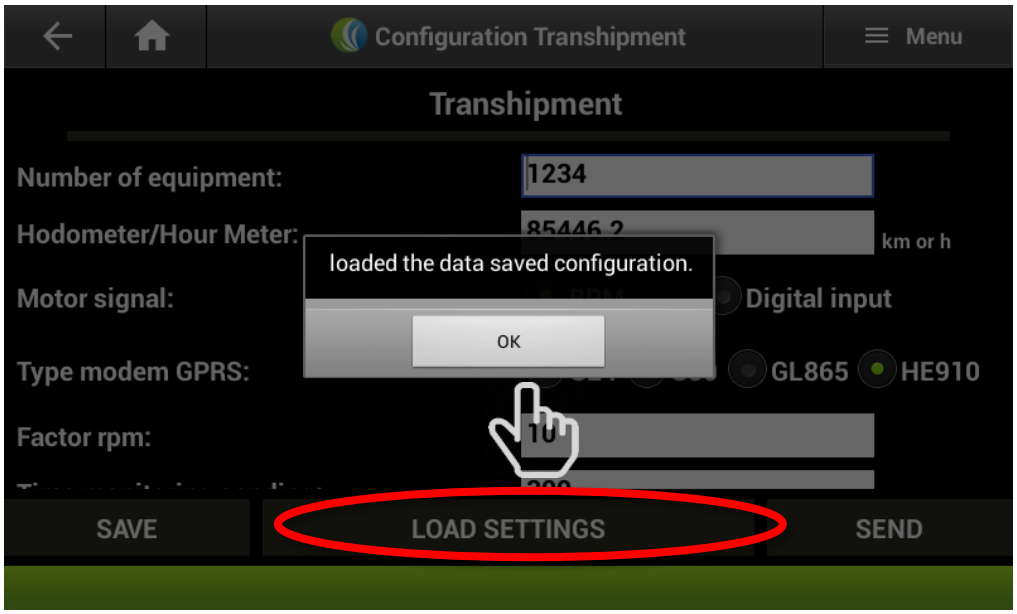
Case Type*	**Distance between the GPS antenna and the center of the 1st truck crate**	**Distance between the GPS antenna and the center of the 2nd truck crate**	**Distance between the GPS antenna and the center of the 3rd truck crate**

1 small crate	3.7 meter		
2 small crates	3.7 meter	7 meters	
3 small crates	3.7 meter	7meters	12.5 meter
1 large crate	7 meters		
2 large crates	5.5 meter	12 meters	
3 large crates	5.5 meter	12 meters	22.5 meter
Small Attached	3.7 meter	7 meters	
Large Attached	5.5 meter	12 meters	
2 medium truck	4.2 meter	10.8 meter	
2 extra-large truck crates	6.3 meter	13.3 meter	

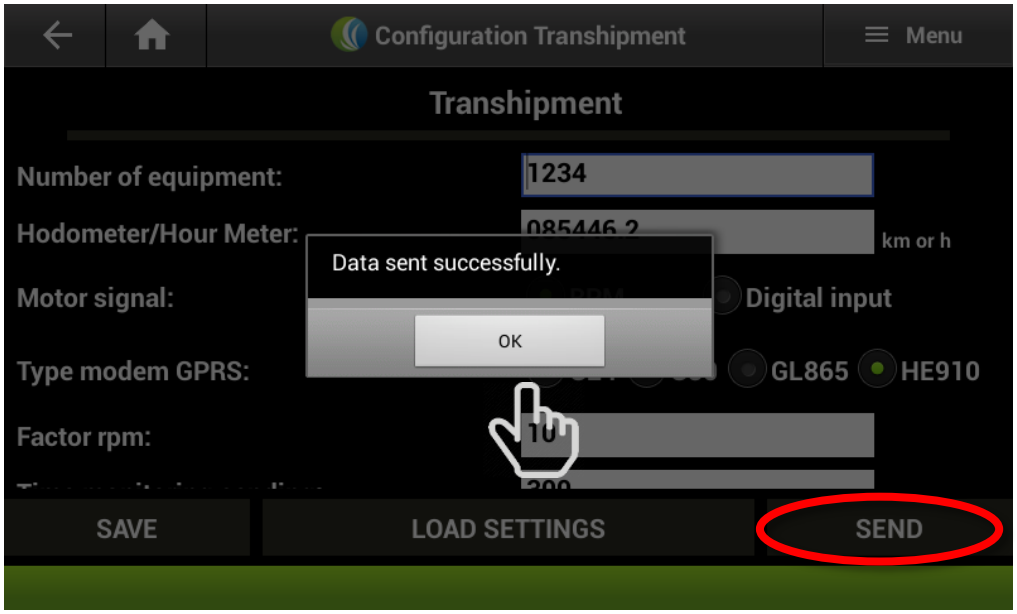
After clicking on the option Save, the following confirmation message will appear: Indicating that it is necessary to fill all the fields before saving the settings



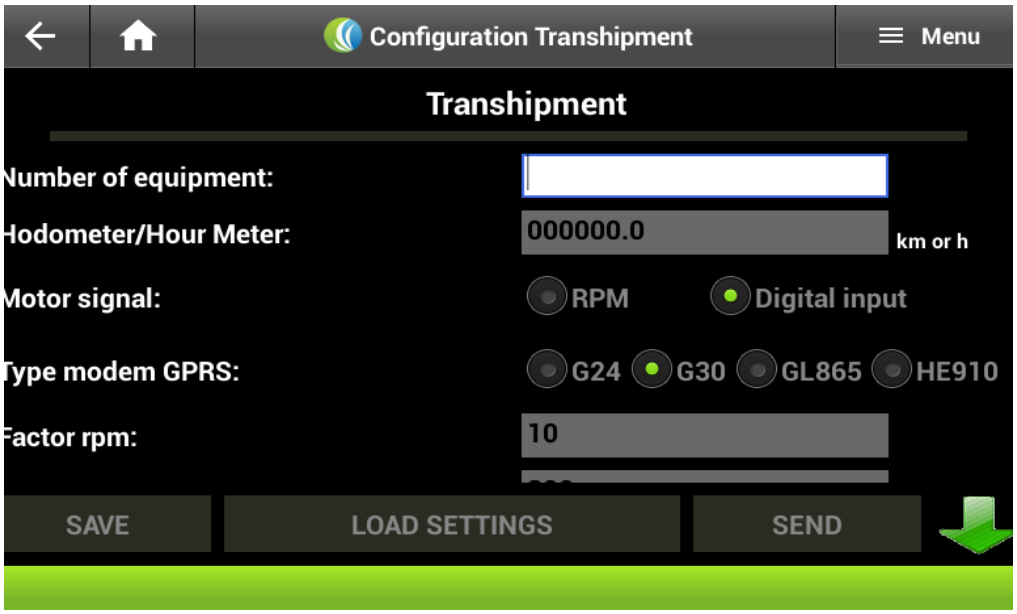
If settings were previously saved on the S7 tablet, those can be loaded on the option "**Loading Settings"**



Then, it is necessary to send such data to the MAG100 computer on board using the option **Send**.

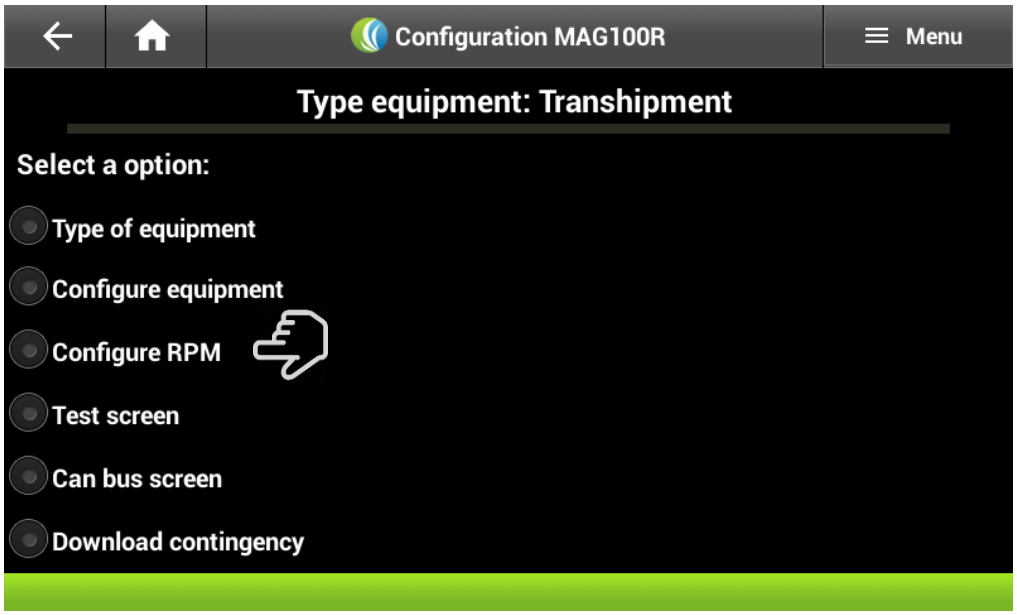


After that, the user must return to the main screen using the bottoms return or home

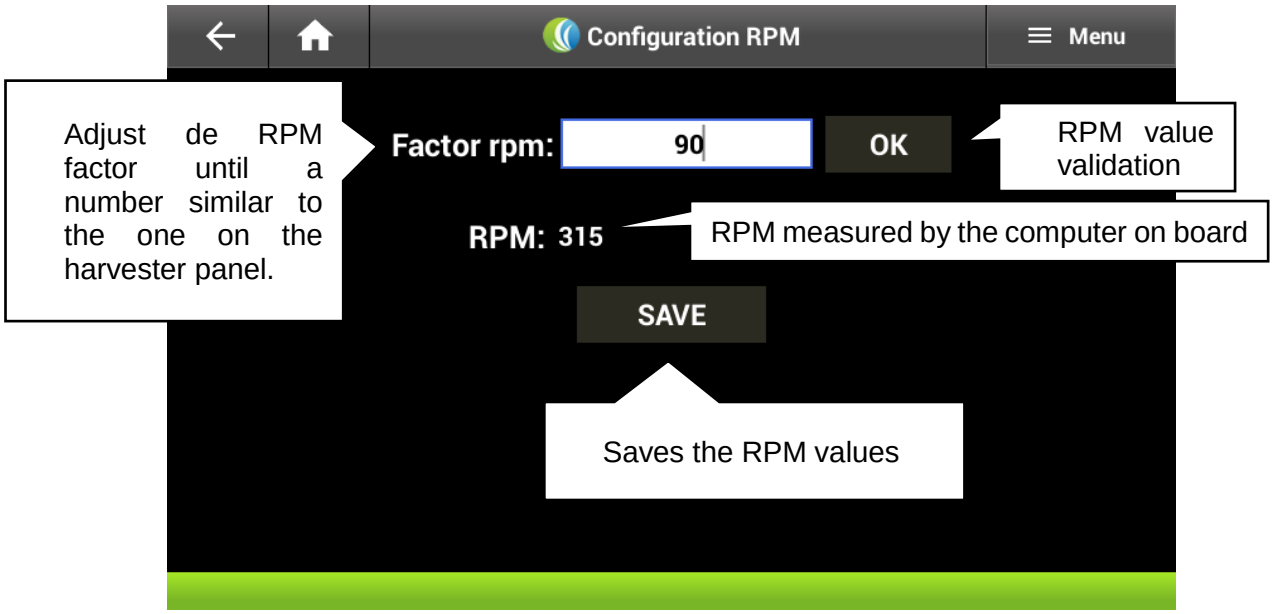


1.1.6. **RPM Factor Settings**

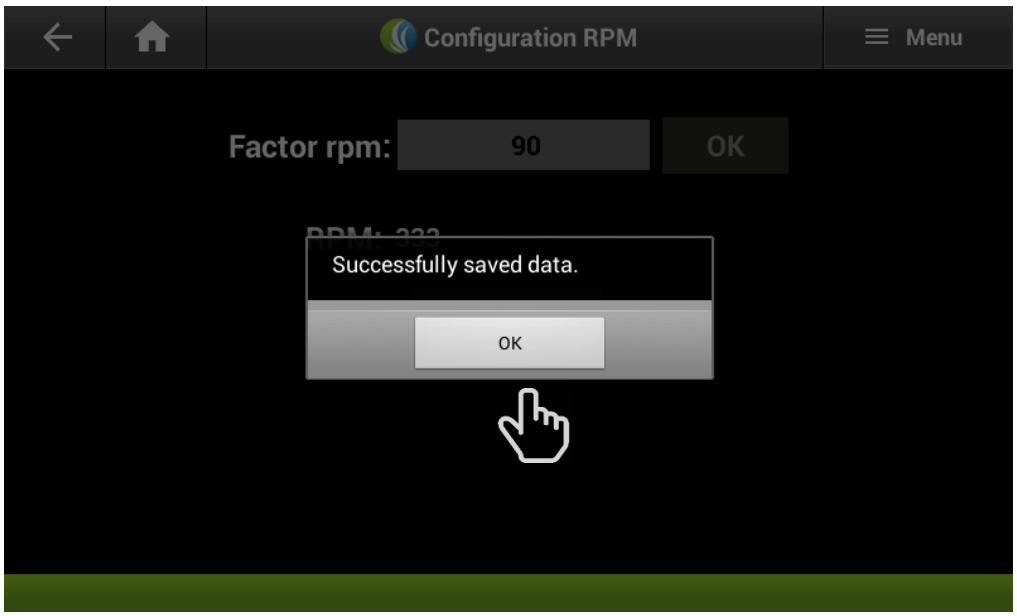
The option **RPM Configuration** allows to calibrate the RPM measurements by means of the RPM Factor:



Only equipment without Can Bus net reading need de RPM calibration. Once selected the field rpm factor, a virtual keyboard will appear to make the necessary value changes:

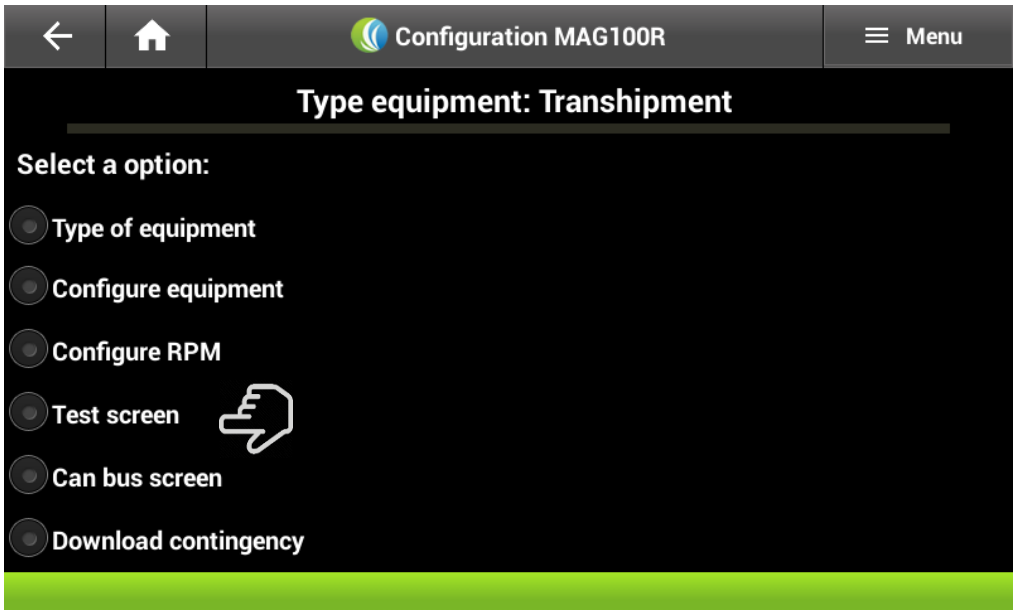


Once the info is saved, the next screen will appear confirming the previous action.



1.1.7. **Signal test screen**

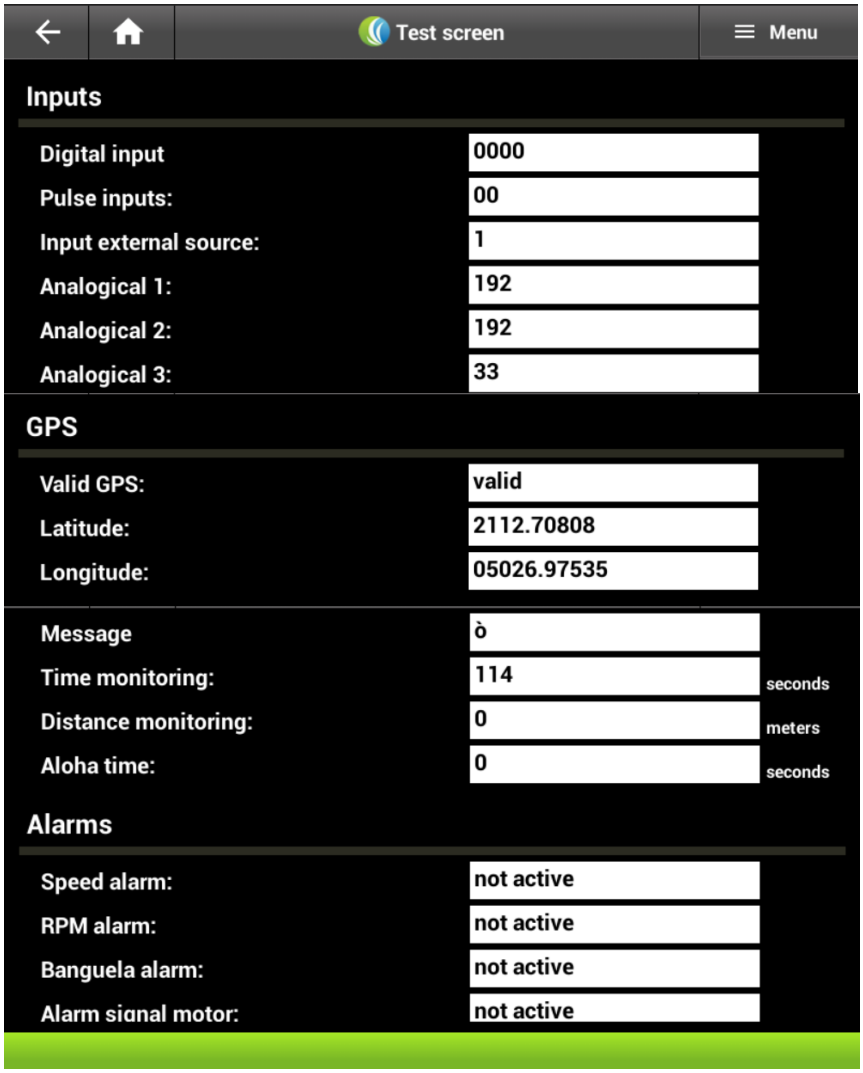
The option **test screen** allows to see the state of the equipment, as well as the value of all the measurements made by the computer on board and the status of it peripherals



Test Screen Description

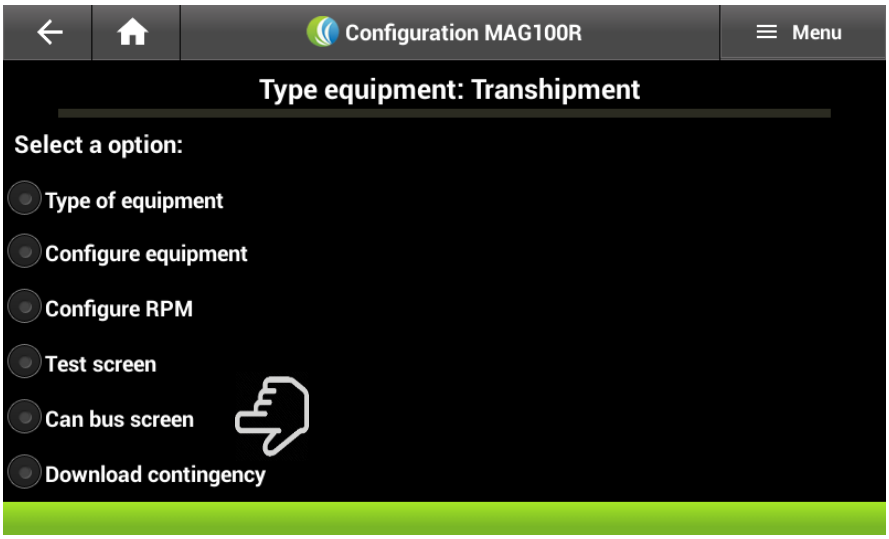
Computer on Board	
Machine Number:	Number of the machine configured.
Odometer/Hours meter:	The odometer and hours meter configured on the CAN BUS.
Speed:	Equipment speed.
RPM:	Actual RPM of the equipment measured by the computer on board, by the CAN BUS net.
Status:	Actual status of the machine: F: Stopped C: Harvest M: Maneuver D: Moving
CF card:	Actual state of memory card Compact Flash: Error or OK.
ENTRYS	
Digital Input:	Digital Input activated by the computer on board (0000 → ED1, ED2, ED3, ED4).
Pulse Input:	Pulse input values (00 → EP1, EP2).
External Input:	Feed.
Analogue 1:	Value measured by the computer on board on the EA1.
Analogue 2:	Value measured by the computer on board on the EA2.
Analogue 3:	Value measured by the computer on board on the EA3.
GPS	
GSP valid:	Actual GPS – Valid or not valid
Latitude:	Equipment Actual Latitude.
Longitude:	Actual Longitude of the equipment.
MODEM GPRS	
Status:	It shows the status of the connectivity process of the modem GPRS (0 – 11).

Message:	7 (MAG200, RECOK, ALOHA): Modem connected on the monitoring system. 6 (ERROR) IP and/or wrong Input or communication problem with the server. 5 (ERROR) Problem with the signal connection with the operator. 1 (ERROR) Problem with the SIM card.
Monitoring time:	Time spent since the last monitoring register.
Monitoring Distance:	Distance travelled since the last monitoring register.
Aloha Time:	Time spent since the last communication with the server.
Alarms:	Alarms actives on the computer on board.

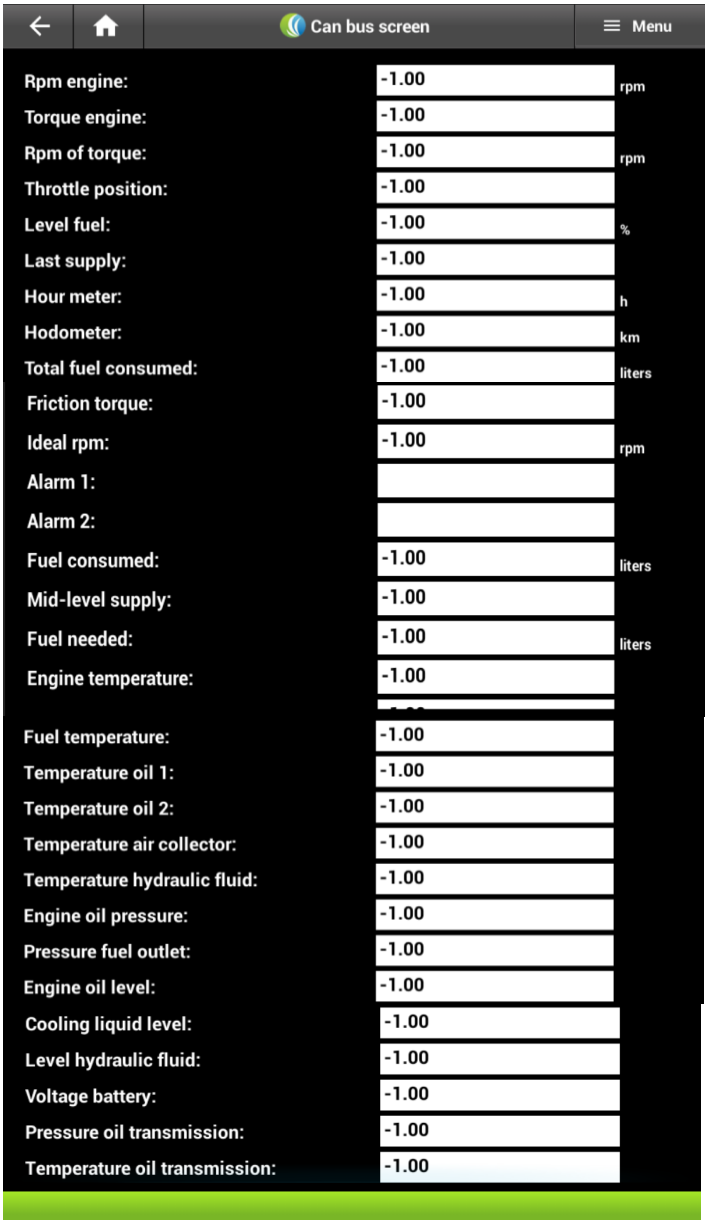


1.1.8. **CAN BUS screen**

Option "**can bus screen**" allows to access the screens with all the info of the Can Bus net, as long as that option is active on the equipment settings.



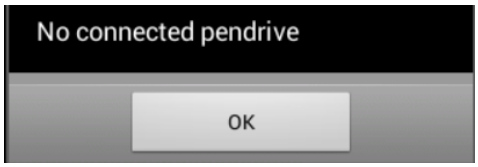
To return to the main screen, you can select the home bottom and the back option.



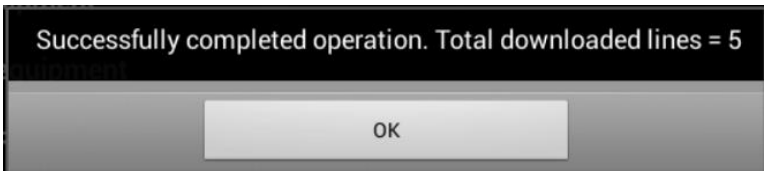
1.1.9. **Download Contingency Option**

On this option the appointment and monitoring info is downloaded from the CF memory card into a flash drive on the tablet.

If there is no flash drive the system will display the following warning:

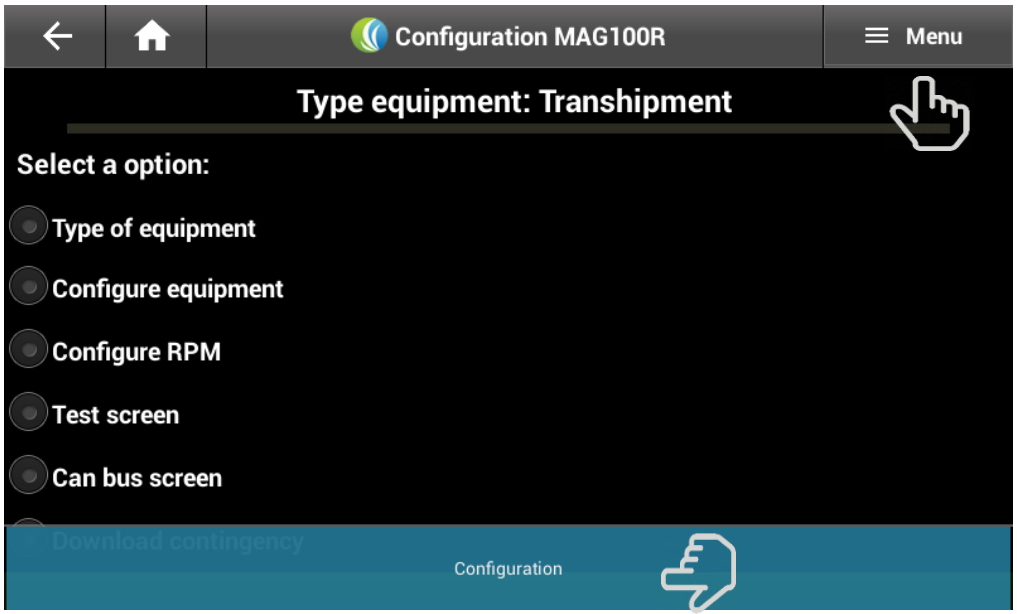


If the flash drive is on the tablet after the info is downloaded the following text will appear:

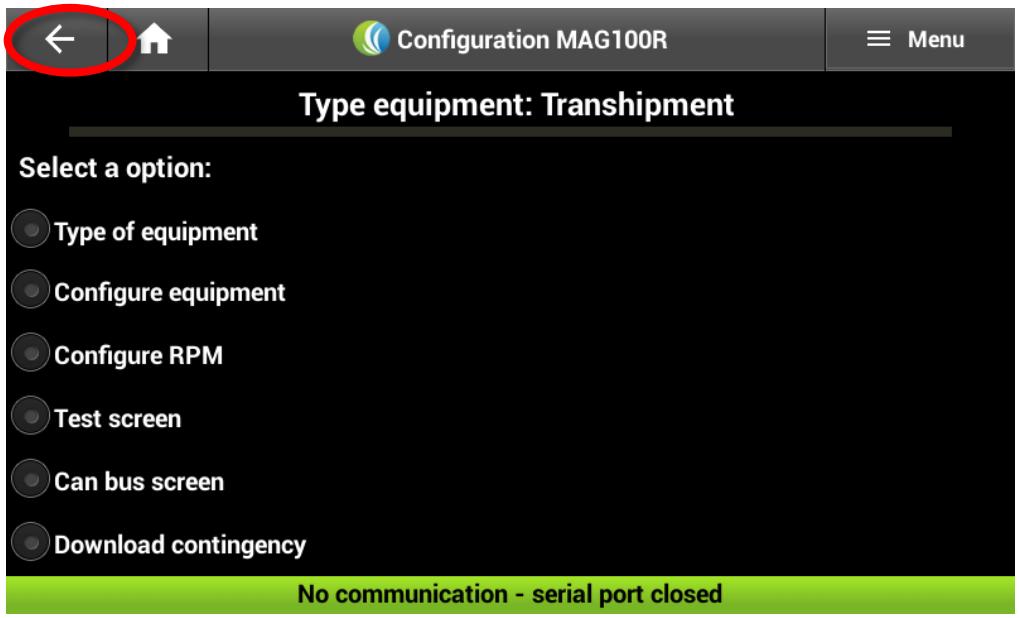


Closing of the Setting Serial Port

After the configuration process is finished, it is necessary to close the APK sCBConfig communication port. This process can be done on the main screen **Menu/Configuration**.



To exit the app used the back bottom.

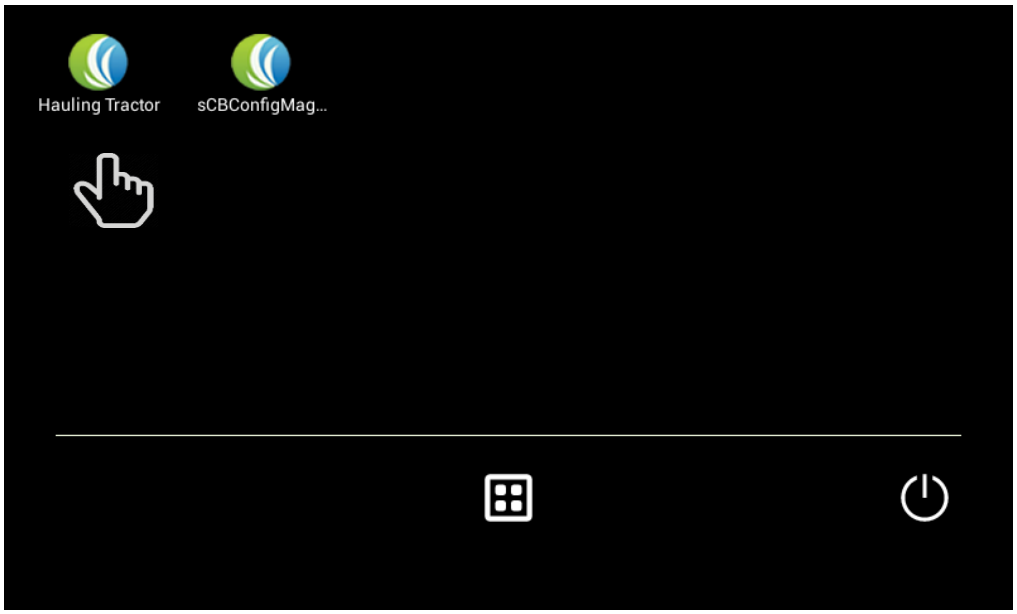


3. APK sCB Transshipment

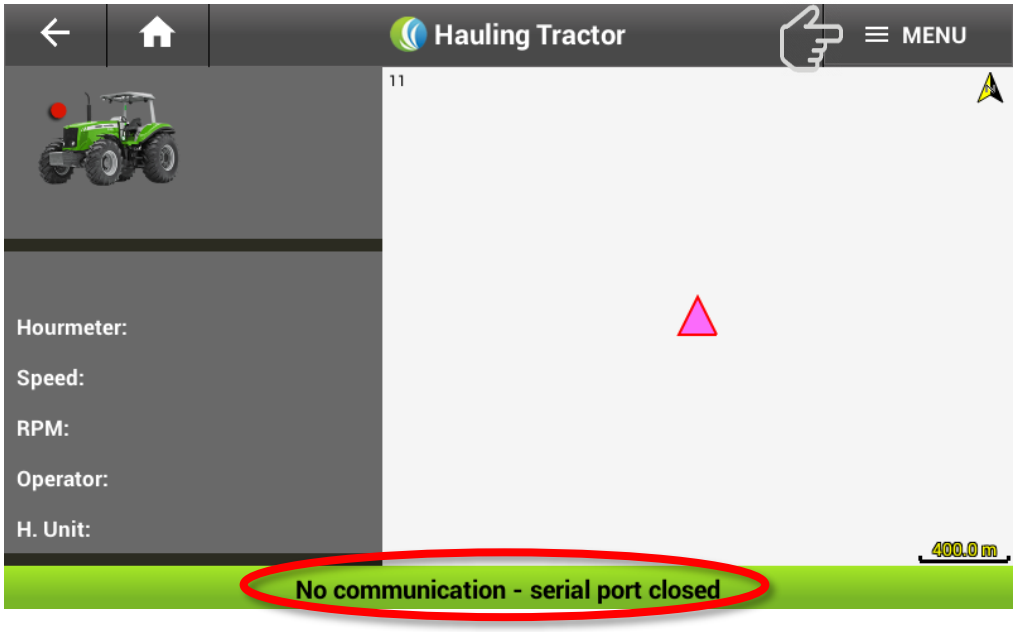
1.11. sCBTransshipment App

The sCBTransshipment app is used on to register and monitor using the MAG 100. In this part of the document, it will be explained in detail the transshipment configuration process.

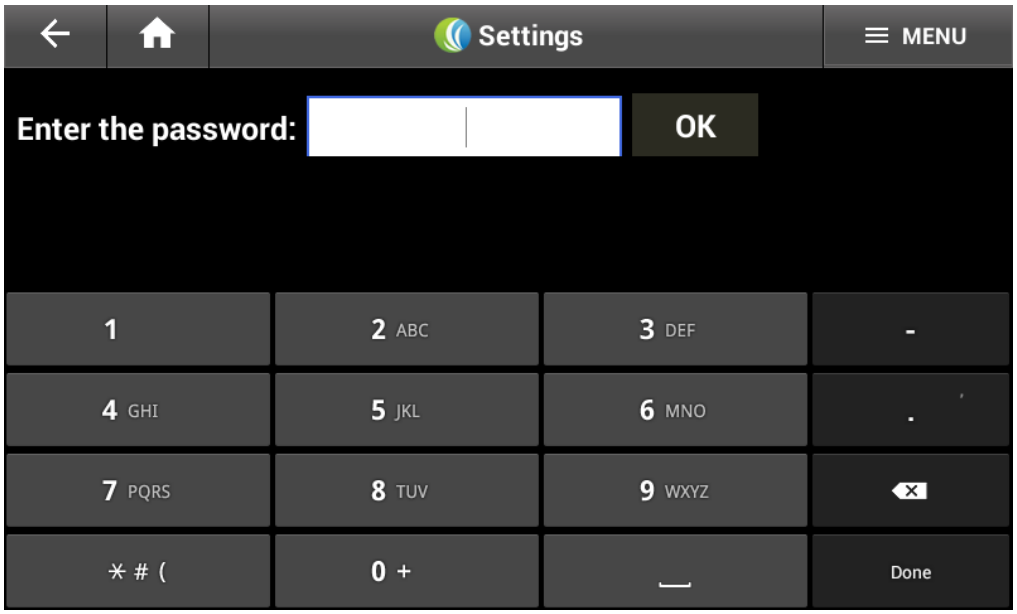
The first step is to open the app:



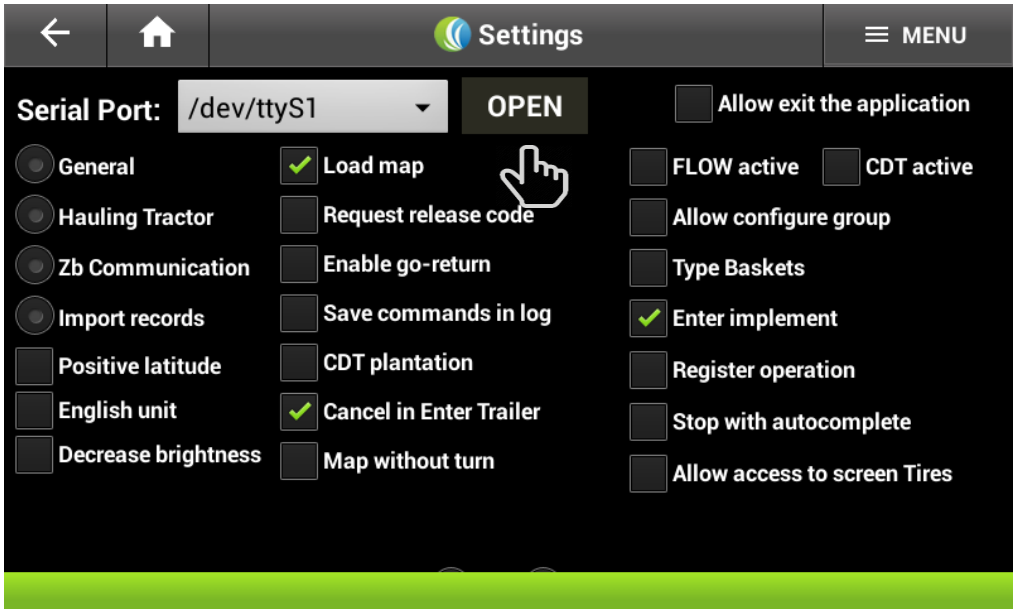
Opening the MAG100 comunication serial port
The first time the app is opened there will appear a warning, of the serial port being closed, on the main screen. In order to open it, you must click on the "**MENU**" , "**Configuration"** option.



For security reasons, the configuration process has a password only known by those authorized to configure the computer on board:

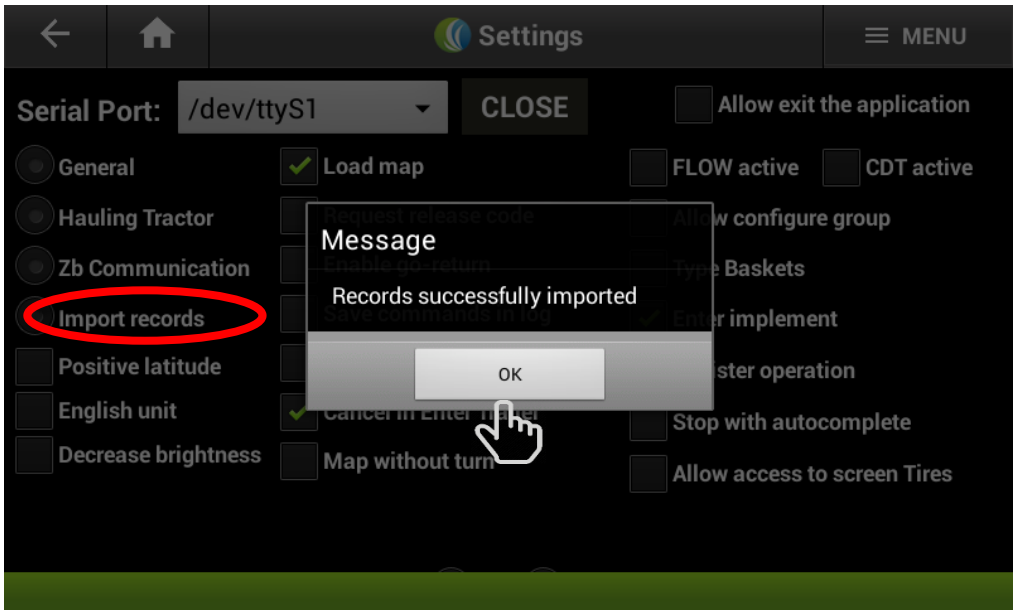


After introducing the password select the open bottom and the correct serial port will appear as a pre-stablished (**/dev/ttyS1**):



1.12. Importing Registers

Once the serial port is opened, the files registered and saved on the tablet on the file "**data/Trabalho/Cadastros"** will be imported automatically

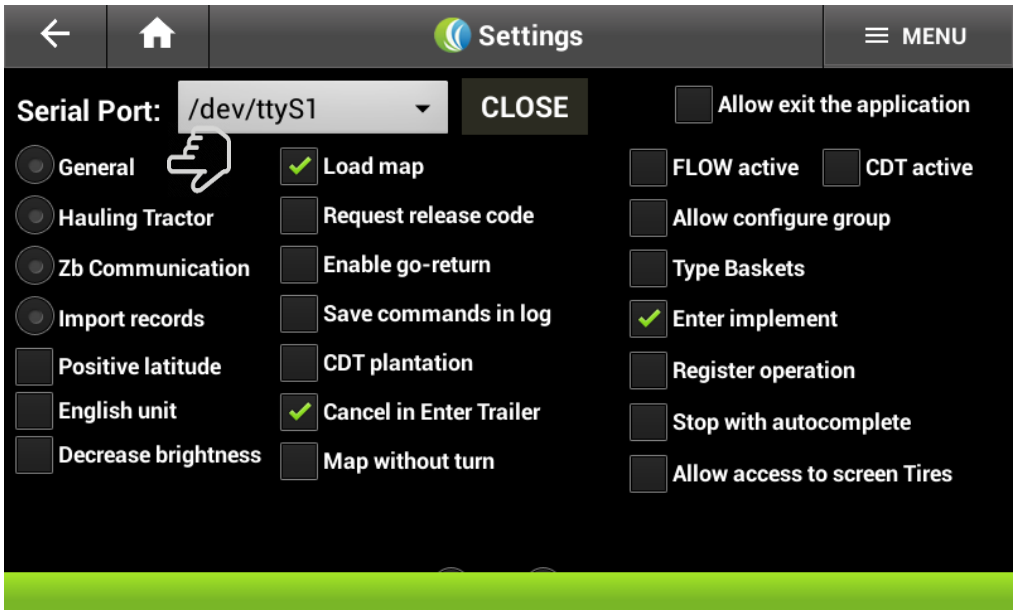


If there is any change on the register files saved on the tablet, it will be necessary to select the option import records without any need of opening the serial port again. If there is any file missing during this process the following message will appear.

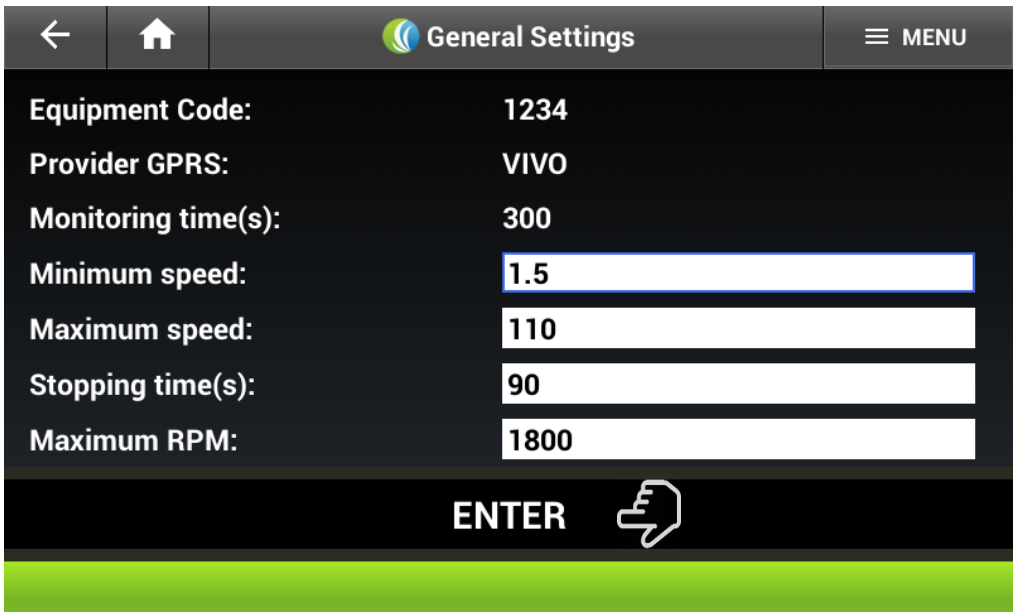
In this case, follow the steps on the option **"Updating the register files on the tablet"**

1.13. Configuring the Operational Parameters of the Transshipment.

Some of the configurations done on the app **sCBConfig** can be seen and modified on this app on the option "**General**"

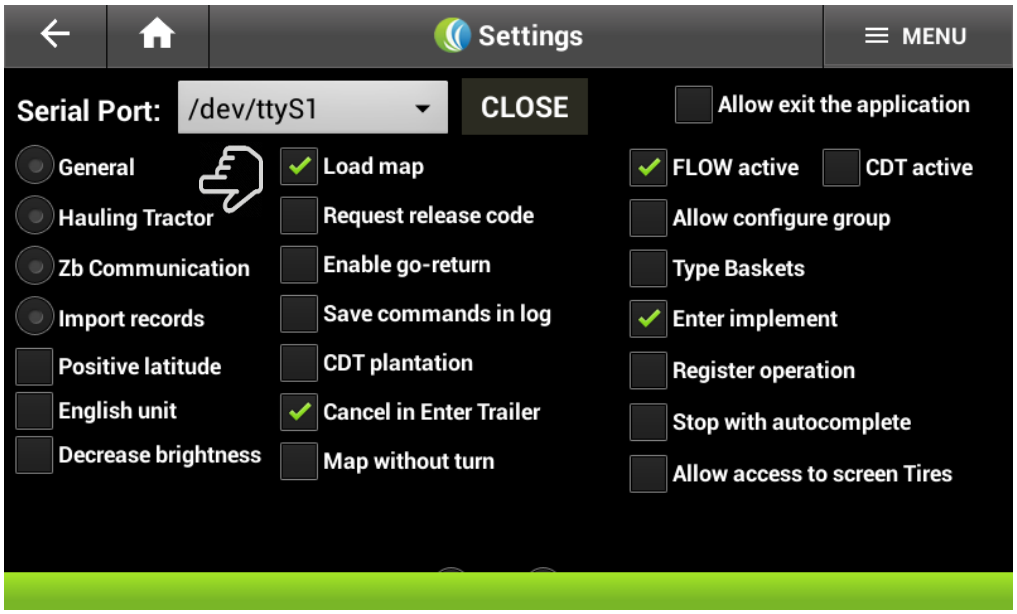


The **General** option will show the machine code, the GPRS operator, the monitoring time among other info that cannot be changed. Other modifiable parameters such as, minimum and maximum speed and RPM stop time will appear on this option. Whenever a modifiable field is activated the virtual keyboard will appear. All modification must be saved using the corresponding option: **"Save"**



1.14. Configuration of the Work shifts

The transshipment option will allow to alter the configuration of item such as TAG's type of crate, lifting signal, crates and cutting capacity as well as configurating the crates with or without password.

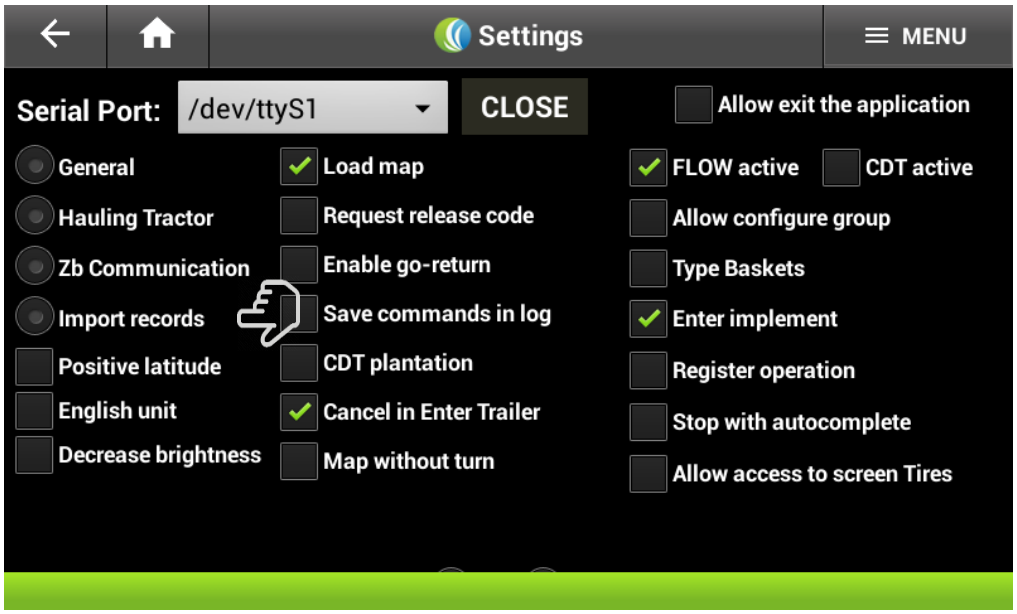


1.15. Zigbee Communication Test

The option “Zigbee Communication” allows to test the Zigbee on the computer on board. Once it is selected, a communication internal test is done. If the test is successful, the message “**Zigbee Communication Ok”** will appear. If the message to appear were **“Zigbee Communication Fail**” the CB must be sent to maintenance.

1.16. Import Records

This option imports the registers saved on the tablet on the file “**data/Trabalho/Cadastros”**. If there is any change on these files saved on the tablet, it is necessary to select this option to enable the changes. After that, the message “**Records imported successfully”** will appear.

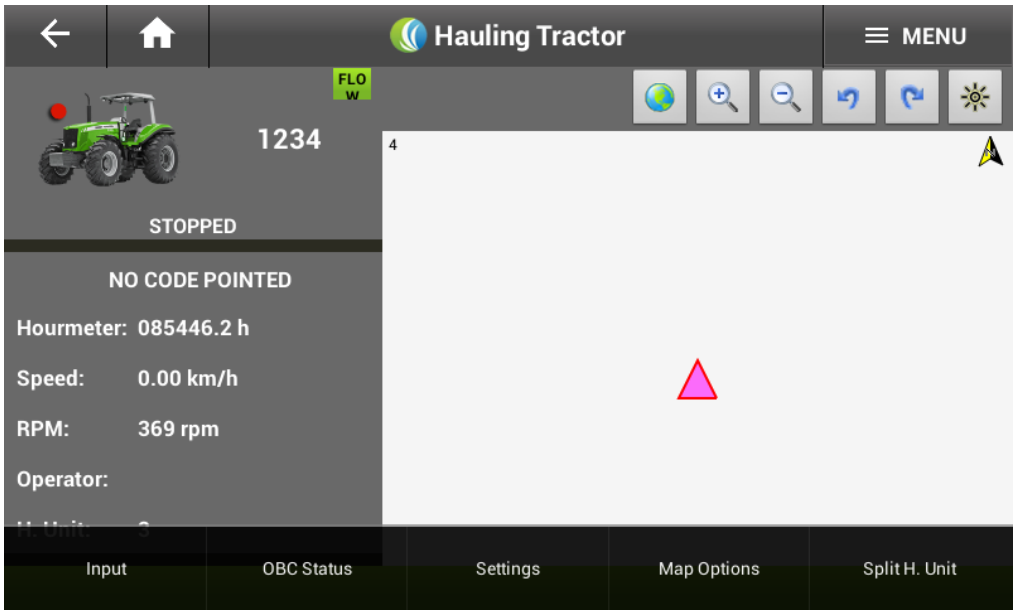


If there is any record missing on the import process the following message will appear **"Records not found on file /data/Trabalho/Cadastros**": If this were the case, the steps on section **"Update the records registered on the tablet"** must be followed.

1.17. Load Map

This option loads on the APK transshipment main screen the harvesting area maps supplied by the farm and saved on the file "**data/Trabalho/Mapas"**.

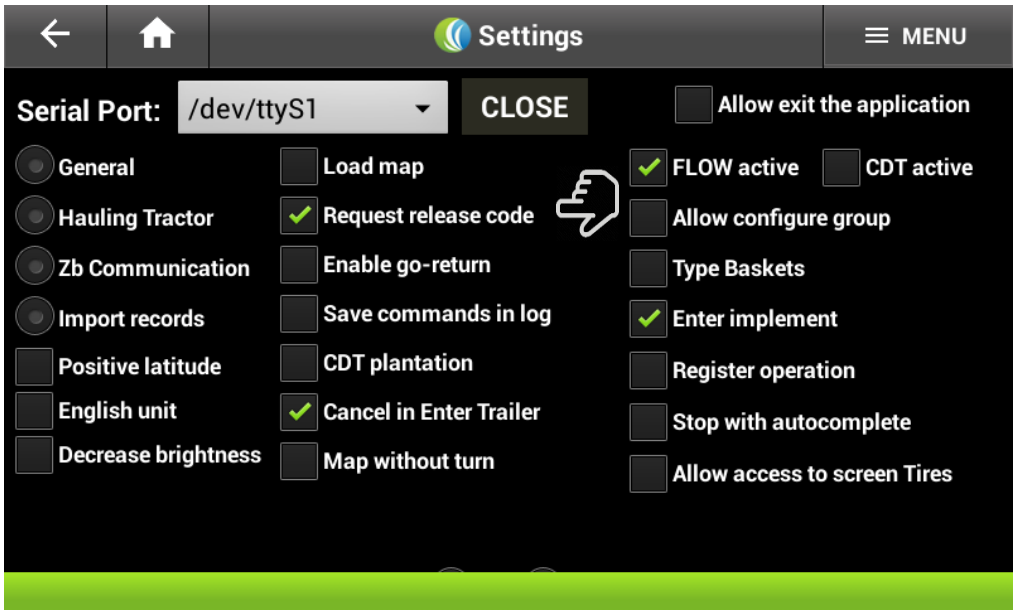
Once this option is selected, on the **Menu /Option Map** on the main screen of the Transshipment will appear the harvesting area map of the farm



When this option is not selected, then it will return to the main screen of the Transshipment APK and will show the Solinftec logo:

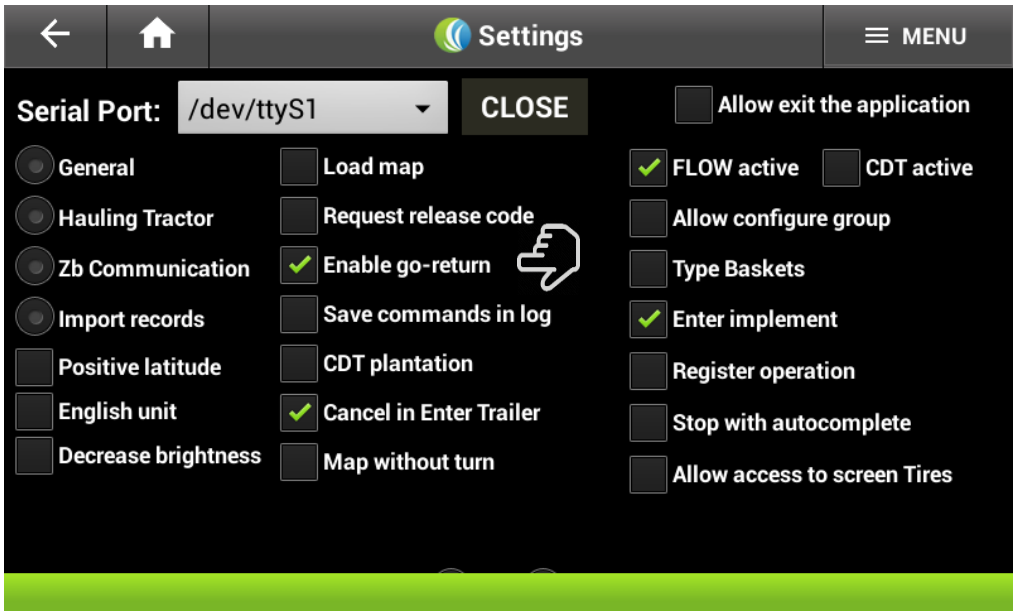
1.18. Request release code

This option is active on any contingency measure. For example, if a transshipment doesn't detect the harvester the computer on board will request the cut order of the harvest.



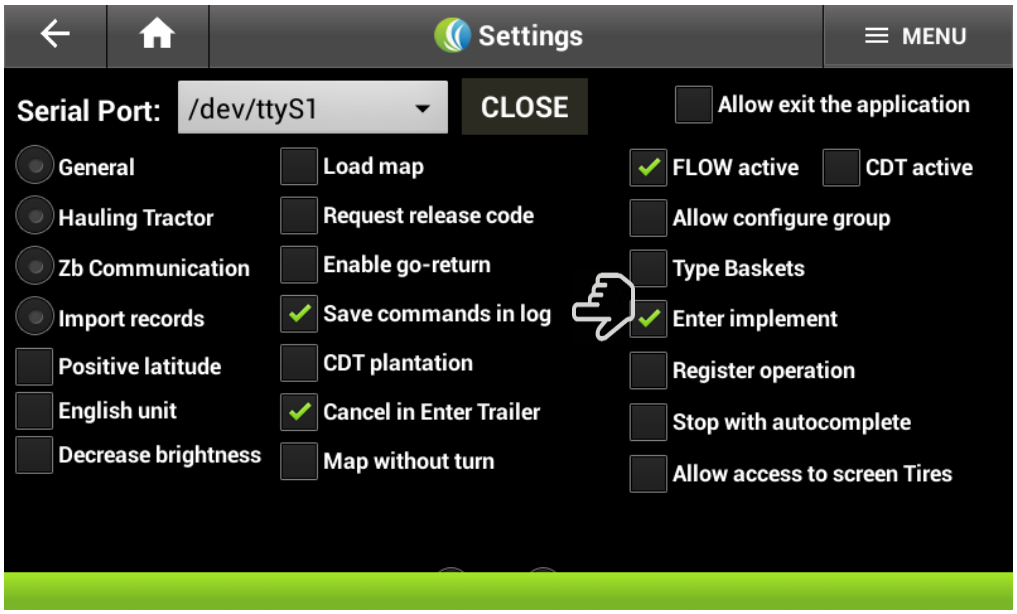
1.19. Enable go-return

This option is used to the transshipment to send information to the coordinator. If the firmware or the “Transshipment coordinator” item0 is active, then this option will also activate the transshipment to act as a coordinator, in case of the CDC:



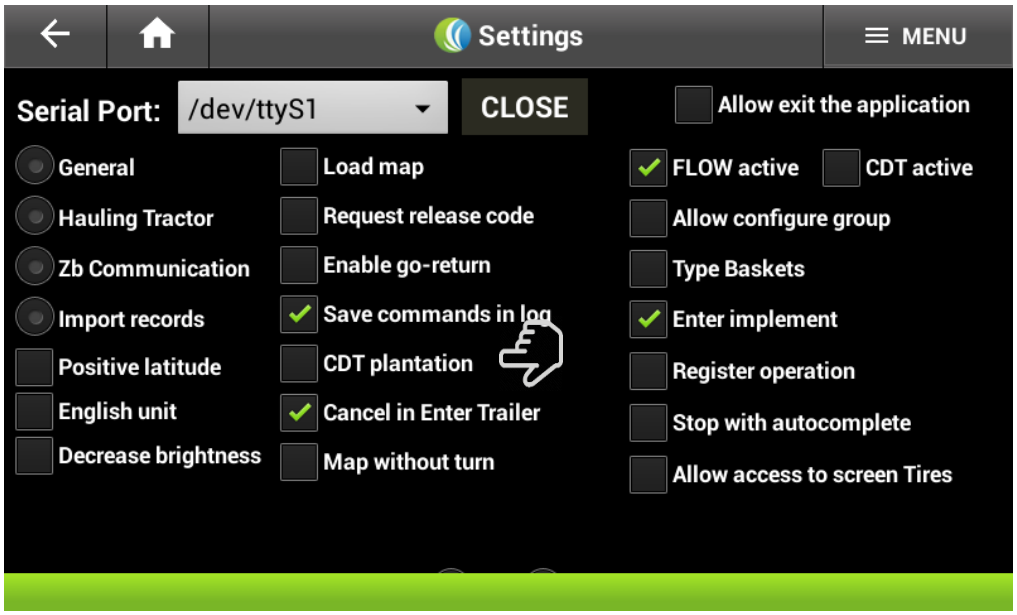
1.20. Save commands in log

In this case, all the commands given will be saved for further analysis using USB cable.



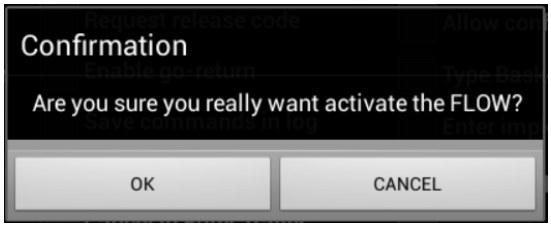
1.21. CDT Planting

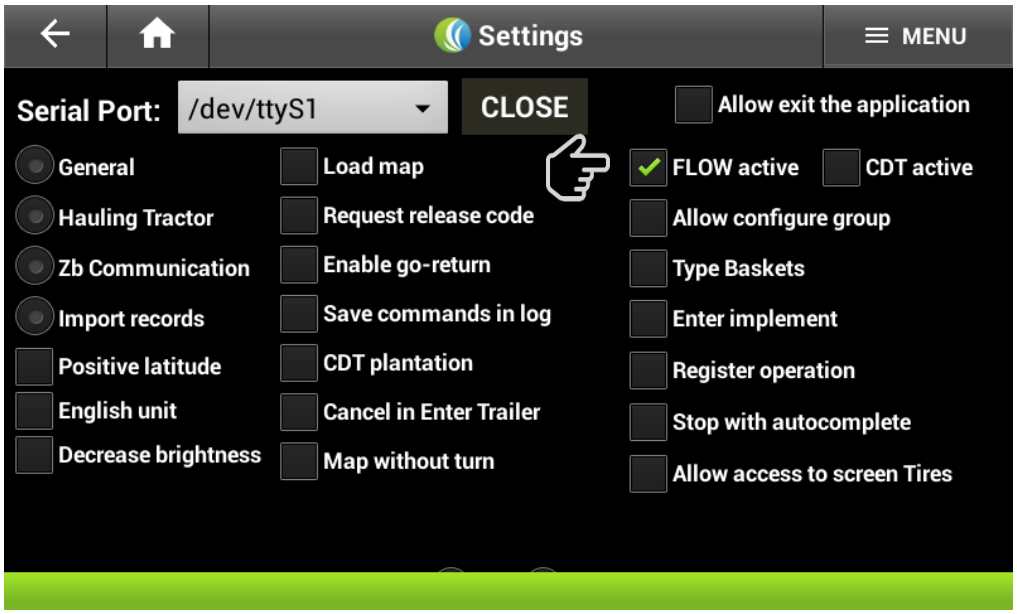
Using this option, the planting features will be activated, if the firmware allows it to



1.22. Active FLOW

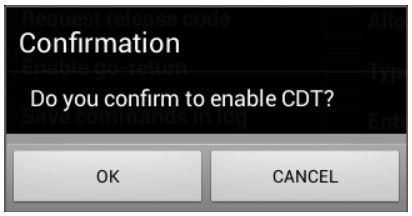
A confirmation check box will appear whenever this option is activated.

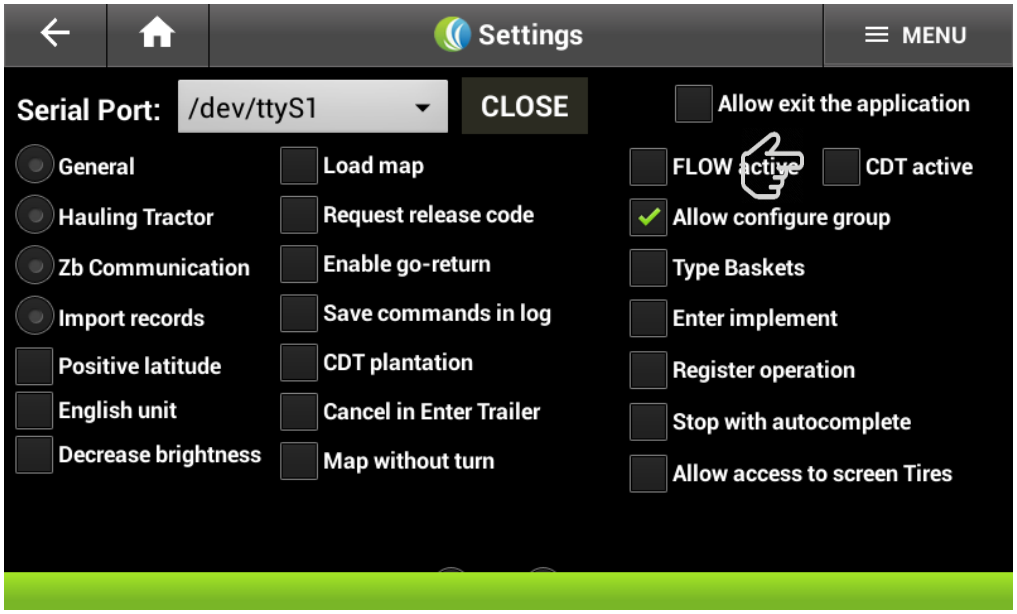




1.23. CDT active

A confirmation check box will appear whenever this option is activated.





1.24. Basket type

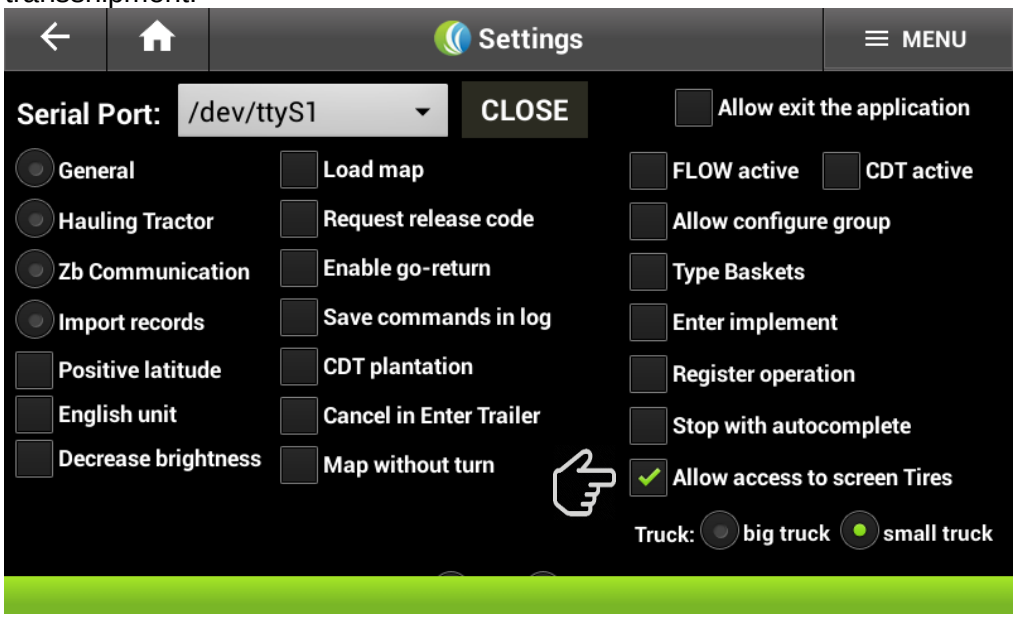
This option allows to enter the **Crate Code** if necessary:

1.25. Enter Implements

This option enables to select any implement.

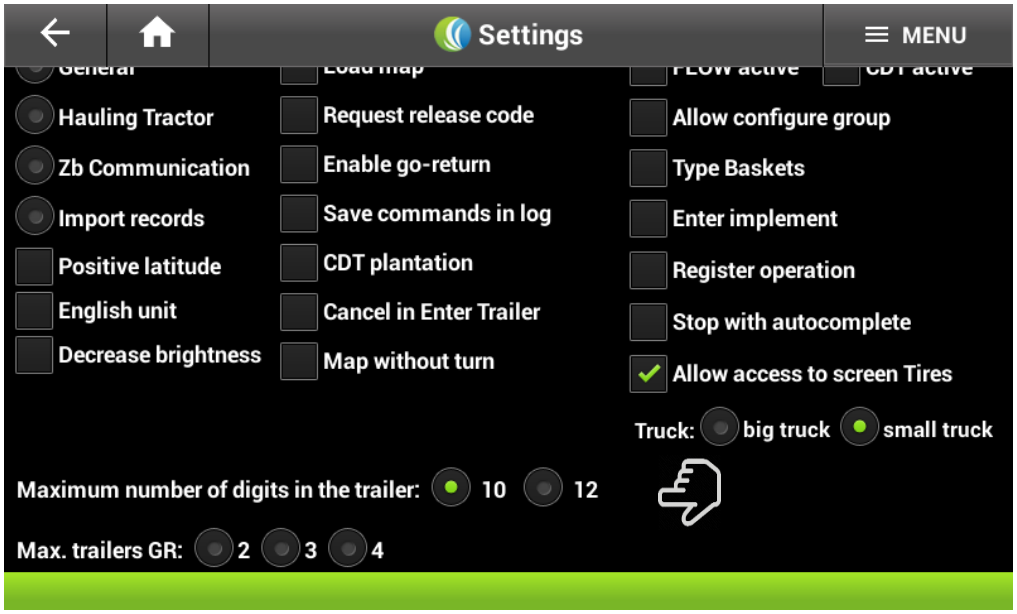
1.26. Allow access to Tire Screen

This option is currently on development, therefore, has not been activated on the transshipment:



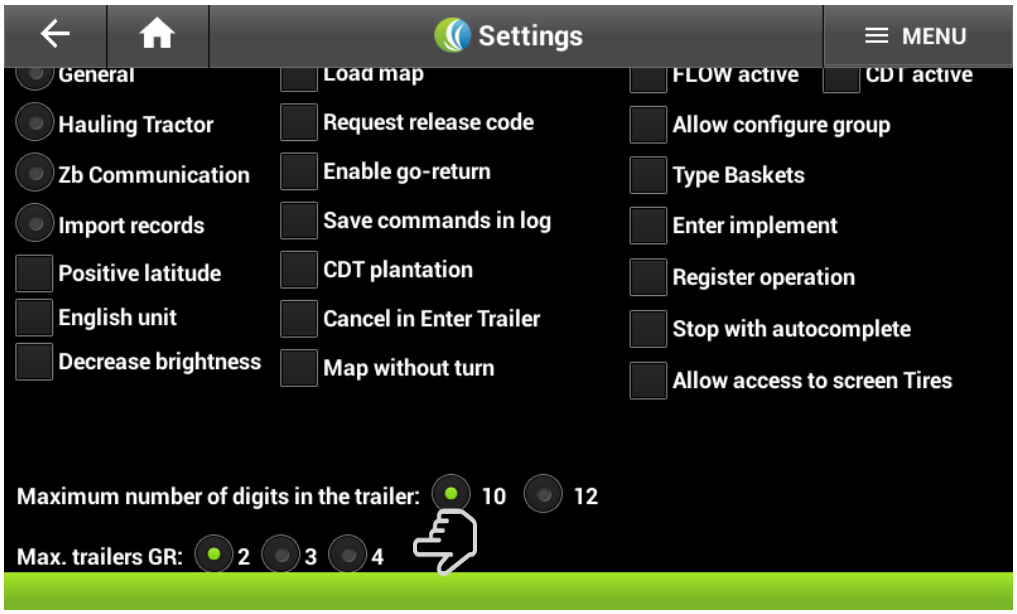
1.27. Maximum number of digits on a trailer.

This option shows a range between 10 to 12 digits, depending on the farms configuration and the maximum number of trailers allowed.



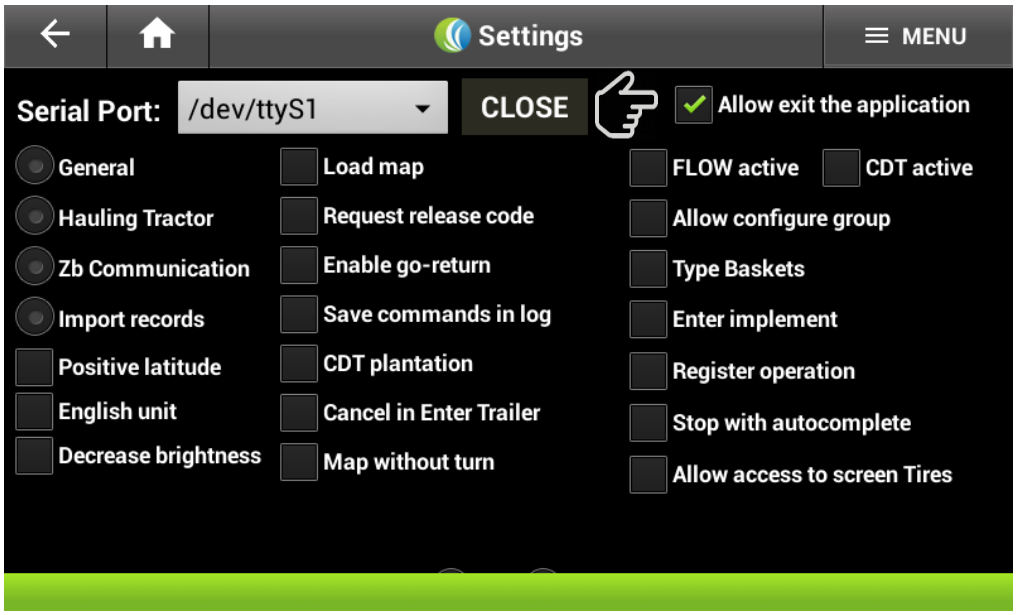
1.28. Max. Trailers GR

This option shows the maximum number of trailers to be storage on the go- return option.



1.29. Exit the application

Through this option the Transshipment APK can be exit and access other apps installed on android.



Once this option is selected, you can return to the main screen of the transshipment App and exit the app using the bottom Return.

4. Transshipment Firmware Configuration

4.1 Parameters of the Transshipment Firmware Configuration

Every MAG 100 Transshipment firmware will be accompanied by the "**Config.txt**" file which has all the current settings of the firmware. In this section will be explained every parameter and its use on the computer on board.

TRANSSHIPMENT	
APP DESCRIPTION	
MODOTESTE	Defines the Firmware test mode. 0: Test Mode disable. 1: Test Mode activated (with the ED4 active, a fixed speed of (5Km/h) and RPM of 640 (Engine on).
FUT	Defines the activation of the FLOW app on Firmware. 0: FLOW app disables. 1: FLOW app active.
ATIVACCT	Defines the activation of the CDT app on the Firmware. 0: Applicative CDT disable (identifies the harvester and changes the status. It doesn't send lifting register ZIG22). 1: App CDT active
ATIVACCTPLANTIO	Defines the activation of the CCT PLANTING app on the Firmware. 0: CCT PLANTING APP disable. 1: CCT PLANTING APP active.
SEMCOORD	Defines the activation of the Transshipment Coordinator Function. 0: Disables the Transshipment Coordinator Function.

	1: Activates Transshipment Coordinator Function.
CERCAELETRONICA	Defines the activation of the Transshipment Electronic Fence. 0: Disables Transshipment Electronic Fence. 1: Activates Transshipment Electronic Fence. (file COORD_CERCAS).
ATIVARRFID	Defines the RFID usage activation. 0: Disables the RFID scanner. 1: Activates the RFID scanner.
PRIORIZASOLINFNET	Defines priority of the data traffic into the system. 0: Prioritizes the GPRS/3G mode for the data traffic. 1: Prioritizes the SOLINFNET for the data traffic.
HARDWARE DESCRIPTION	
ENTRADAX7	Defines the interface on the MAG100. 0: Interface by Bluetooth. 1: Interface on the S7 screen.
VALIDAEMX7	Defines the validation of the digital data. 0: Uses the CF register on the validation of the digital data. 1: Uses the S7 register on the validation of the digital data.
LIMITAPULOS	Configuration of the jumps on the registers send by the Zigbee. 0: Doesn't limit the number of jumps on the Zigbee net. 1: Limits on 2 the number of jumps of the Zigbee.
TAGBASCULAMENTO	Defines the activation of the Lifting Tag use. 0: Activates the lifting status of the crates on the digital input. 1: Activates the lifting status of the crates on the Lifting Tag.
RPMPELACAN	Defines the activation of the RPM Reading on the CAN net 0: Activates the RPM reading signal. 1: Activates the RPM reading signal on the CAN net
HODOMHORIMCAN	Defines the activation of the Odometer/Hour meter on the CAN net. 0: The Odometer/Hour meter info will be calculated by the CB. 1: Activates the Odometer/Hour meter Info Reading by the CAN net.
RTKPORCX3	Defines the activation of the RTK signal Reading of the crate 3 (pin 7/ED4). 0: Activates the lifting Reading signal of crate 3on the digital input 4 (pin 7).

	1: Activates the RTK Reading signal on the digital entry 4 (pin 7).
BAUDRATEZB	Defines the communication speed with the ZIGBEE. 9600: Speed Pattern. 15200: Speed Test.
OPERATION DESCRIPTION	
VALIDAIMPL	Defines the validation of the digital implement codes on the register. 0: Doesn't validate the implement code on the file registered C_IMPLEMENTO. 1: Validates the implement code in the file registered C_IMPLEMENTO.
VALIDAEQUP	Defines the validation of the digital equipment codes on the register. 0: Doesn't validate the equipment code on the register C_EQUIP. 1: Validates the equipment code on the register C_EQUIP.
PRIORIZAPARADA	Activates the function that prioritizes the call of Harvesters on the FLOW app. 0: Transshipment doesn't prioritize the stopped harvesters on the FLOW calls. 1: Transshipments prioritize the stopped harvesters on the FLOW calls (identifier 17 on the zig call).
GRUPOSFUT	Activates the Group work function on the FLOW app. 0: Doesn't send coordinates to the ZIG 29. 1: Sends coordinates to the ZIG 29 to work on group only to harvesters with MAG100.
DESLOCAC1T	Activates the function maintain Harvester assigned with ZOG1T register on the FLOW app 0: Transshipment maintain Harvester assigned when receives the ZOG1T register of that harvester with a different transshipment. 1: Transshipment release the harvester assigned when it receives the ZIG1T from that harvester with a transshipment waiting.
COLHEDORA300	Defines the ZIG29 answer time on the FLOW app. 0: Harvester MAG100. 1: Changes the (zig29) answer time to the calling of the harvester, it sends ok to the zig 17.
CARRETA12DIG	Defines the number of digits of the codes on the crates. 0: Works with 10 digits crates codes. 1: Works with the 12 digits code crate.
PREGQUANTOSQ	Activates the lifted crates request on the FLOW app. 0: When the FLOW code is entered, it

	doesn’t ask: “How many crates were lifted.?". 1: When the FLOW code is entered, it asks: “How many crates were lifted.?".
NOFUTDESLOCCARR	Defines the usage of the stop time “Transshipment Line”. 0: Enters on Transshipment Line on any condition the stop time code with identifiers is entered. ador "H". 1: It doesn’t enter on Transshipment Line when the stop time code identifies with and H if it was previously on moving for loading stage.
CORRIGEDATAHFUT	Data and time correction using FLOW. 0: Doesn’t correct date or time using FLOW. 1: Corrects the date and time using FLOW.
DATALIMITEFUT	Defines the validity activation data on the FLOW app. 0: The FLOW app will be active indefinitely. 170720 (aammdd): The FLOW app will be active until July 20, 2017.
TPARADABASC	Defines the stop time of the lifting stage to ask for the stop time code (in seconds). 180: When the transshipment passes the 180 second on lifting stop time, it asks for a stop time code.
NOBASCMANOBRA	Defines the possibility to enter on lifting state on the status of loading cane and maneuver. 0: It sends records of the lifting process when loading cane and maneuver. 1: It doesn’t send lifting records on the status of Loading and Maneuver.
BASCLEVANTACX	It Defines a time filter to start the lifting status. 0: Applies 5 seconds filter to start the lifting status when the crate is lifted. 1: it starts the lifting status immediately when the crate is lifted.
LIMITABASC	Defines the lifting limit event for crate. 0: It doesn’t limit the lifting for crate. 1: It limits the lifting for the selected crate.
NOCOLHEDCARREG	Defines the condition that recognizes the harvester. 0: Recognizes the harvester without condition 1: It doesn’t recognize the first 5 minutes loading.
HODOMETRO	Defines the info to be send on the orometer and hour meter records. 0: It sends the orometer kijos (standard). 1: It sends hour meters kijos.

KIJOSCAN	Defines the info system of the CAN net. 0: It doesn't send Can records even if it is active. 1: It sends records of the CAN.
DEFINIÇÕES DE ALAMES	
TOCIOSO	Defines the idle engine time (in seconds). 300: The engine must maintain the alarm condition for 300 consecutive second on stop state to generate the alarm.
REDE ZIGBEE FIRMWARE	
REDEZBH	High address of the e Zigbee (H).
REDEZBL	Low address of the Zigbee (L) net – All together with the high address form the Zigbee (HHLL).
VERSÃO FIRMWARE	
VERSIONE	Development year of the firmware version.
VERSIOND	Sequence of the firmware.
OUTROS CULTIVOS	
MAPASANALITICOS	
CAMBIOCONDICAO	
RELATORIOPOR33	

5. Transshipment records registration

4.1 Formatting the records on the transshipment memory card CF.

The CF memory card installed on the MAG100 needs to be formatted, using the app "CF Formatting" given by Solinftec, using some files to ensure the functioning of the computer on board. Below, there is a description of the necessary files for the transshipment:

On the transshipment CF there will be storage the following files:

- C_CHECKLIST;
- C_CHECKLIST_ITEM;
- C_FUNC;
- operacoes_manutencao;
- operacoes_paradas;
- operacoes_produtivas;
- C_EQUIP;
- C_COORDENADAS;
- C_COORD_CERCAS
- fazendas;
- C_FAZENDAS.

Below there is the description of each of the files.
C_CHECKLIST:
In this case, there is a code register of the groups in which every checklist is framed
Example: 01;S

Field	Description
01	Checklist item code
S	Checklist implement indicator

Whenever a checklist is not necessary, that file can be registered on one line.
C_CHECKLIST_ITEM:
Checklist Item ordered by group:
Example: 01;001;CHECK FUEL LEVEL

Field	Description
01	Team code
001	Item code
CHECK FUEL LEVEL	Item description

Whenever a checklist is not necessary, that file can be registered on one empty line:
01;001;VAZIO
C_FUNC:
The employee record order from the small to the biggest registration code
Example: 140292;RENATO RUY;O;140292;1

Field	Description
140292	Employee registration
RENATO RUY	Name of the employee
O	Employee Role (O = Operator; M = Mechanic)
140292	Employee registration
1	Reserved field

operacoes_manutencao:
The maintenance operations record order from the small to the biggest registration operation code
Example: 999, MANUT HID, 0

Field	Description
999	Operation code
MANUT HID	Operation description
0	Reserved

Whenever the maintenance operation is not necessary, that file can be registered on one empty line:
0001;VAZIO;0

operacoes_paradas:
The unproductive operations record ordered from the small to the biggest registration operation code
Example: 104;Treinamento/Orientação;N;N;S

Field	Description
104	Operation Code
Treinamento/Orientação	Operation Description
N	Maximum operation time (minutes), if the maximum time isn't stated, it must remain in N
N	Special code linked to the operation*
S	Reserved Field

Transshipment special codes* and their functionality:

Field	Description
1	Operation Refueling, immediately, the amount of fuel necessary will be asked.
2	Shift change, the register of the next operator will be asked.
4	Transshipment assigned to a harvester. From the FLOW
0	No special code
N	Stop without special code
S	Maintenance Operation– Enter the maintenance code
X	Maintenance Operation– Does not need to enter the maintenance code
L	Indicates the operation to start the lifting
H	Stop on transshipment line (empty) – FLOW
C	Waiting for lifting (full) – FLOW
5	Moving on board
6	Increasing the Alarm of Idle engine
A	Cleaning assistance on the courtyard– available only on ZIG19 calls
D	Enters on Moving for dumping status
B	Enters on lifting status– for contingencies if there is no CDC
7	Mandatory, stays on this operation until a new stop code is entered

operacoes_produtivas:

The productive operations record ordered from the small to the biggest registration operation code

Example: 1000;COLHENDO CANA;N;N;N

Field	Description
1000	Code operation
COLHendo	Description of the Operation
N;N;N	Reserved Field

C_EQUIP:

This field is used only on the CF card. The equipment records ordered from lowest to highest operation code.

Example: 1111;COLHEDORA

Field	Description
1111	Code/ equipment number
COLHEDORA	Equipment description

C_COORDENADAS:

This option deals with necessary record of the point that identify a controlled area.

Example: PATIO;25.356587;47.547896

Field	Description
PATIO	Coordinates description
25.356587	Latitude
47.547896	Longitude

If it is not needed, that field can be registered with a null line.

C_COORD_CERCAS:
This option deals with necessary record of the coordinates from ambiances that need to be controlled.
Example: 2152.28788,05026.17930, CERCA_1,1,300, 0

Field	Description
2152.28788	Latitude
05026.17930	Longitude
CERCA_1	Field description
1	Fence code
300	Fence diameter
0	Special code

If it is not needed, that field can be registered with a null line.
It deals with the register of farms, sector, and field. These are registered by the code of the farm, fallows the zone code and finally the field code.
Example: 0002;FAZENDA TANGARA,0011,0204

Field	Description
0002	Farm Code
FAZENDA TANGARA	Farm Description
0011	Sector Code
0204	Field Code

If it is not needed, that field can be registered with a null line.
C_FAZENDAS
It deals with the register of farms, ordered from the lowest to the highest operation code.
Example: 0002;FAZENDA TANGARA

Field	Description
0002	Farm Code
FAZENDA TANGARA	Farm Description

5.2 File Register to the Transshipment APK

The Transshipment APK installed on the S7 tablet need some files on the register of information to avoid typing errors.
The following files must be on the S7 memory.

- C_CHECKLIST_ITEM;
- C_FUNC;
- operacoes_manutencao;
- operacoes_paradas;

- operacoes_produtivas;
- C_IMPLEMENTO;

Below there is a more detailed explanation of the previous files.
C_CHECKLIST_ITEM:
It deals with the checklist items organized by the team.
Example: 01;001;VERIFICAR O NIVEL DE ÓLEO

Field	Description
01	Team description
001	Code of the item
VERIFICAR NIVEL DE ÓLEO	Description of the item

If it is not needed, that field can be registered with an empty line as follows:
01;001;VAZIO
C_FUNC:
It deals with the register of the employees organized from the lowest to the highest registration code.
Example: 140292;RENATO RUY;O;140292;1

Field	Description
140292	Employee register
RENATO RUY	Name of the employee
O	Role of the employee (O = Operator; M = Mechanic)
140292	Register of the employee
1	Reserved Field

operacoes_manutencao:
it deals with the maintenance operation organized from the lowest to the highest operation code.
Example: 999, MANUT HID, 0

Field	Description
999	Operation code
MANUT HID	Description of the operation
0	Reserved

If it is not needed, that field can be registered with an empty line as follows:
0001;VAZIO;0
operacoes_paradas:
It deals with the unproductive operation organized from the lowest to the highest operation code.
Example: 104;Treinamento/Orientação;N;N;S

Field	Description
104	Operation Code
Treinamento/Orientação	Description of the operation
N	Maximum operation time (minutes), if the maximum time isn't stated, it must remain in N
N	Special codes linked to the operation
S	Reserved fields

Transshipment special codes* and their functionality:

Code	Description
1	Operation Refueling, immediately, the amount of fuel necessary will be asked.
2	Shift change, the register of the next operator will be asked.
4	Transshipment assigned to a harvester. From the FLOW
0	No special code
N	Stop without special code
S	Maintenance Operation– Enter the maintenance code
X	Maintenance Operation– Does not need to enter the maintenance code
L	Indicates the operation to start the lifting
H	Stop on transshipment line (empty) – FLOW
C	Waiting for lifting (full) – FLOW
5	Moving on board
6	Increasing the Alarm of Idle engine
A	Cleaning assistance on the courtyard– available only on ZIG19 calls
D	Enters on Moving for dumping status
B	Enters on lifting status– for contingencies if there is no CDC
7	Mandatory, stays on this operation until a new stop code is entered

operacoes_produtivas:

It deals with the register of productive operations organized from lowest to highest operation code.

Example: 1000;COLHENDO CANA;N;N;N

Field	Description
1000	Operation Code
COLHENDO CANA	Description of the operation
N;N;N	Reserved fields

C_IMPLEMENTO:

It deals with the implement register organized from lowest to highest implement code.

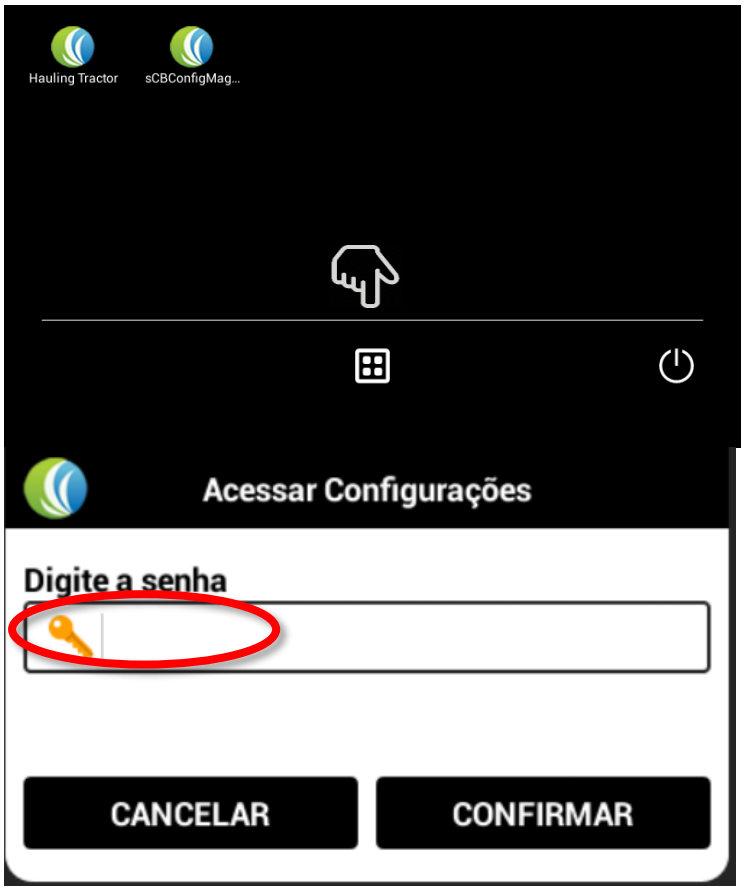
Example: 234;IMPLEMENTO;6

Field	Description
234	Implement code
IMPLEMENTO	Description of the implement
6	Length of the implement

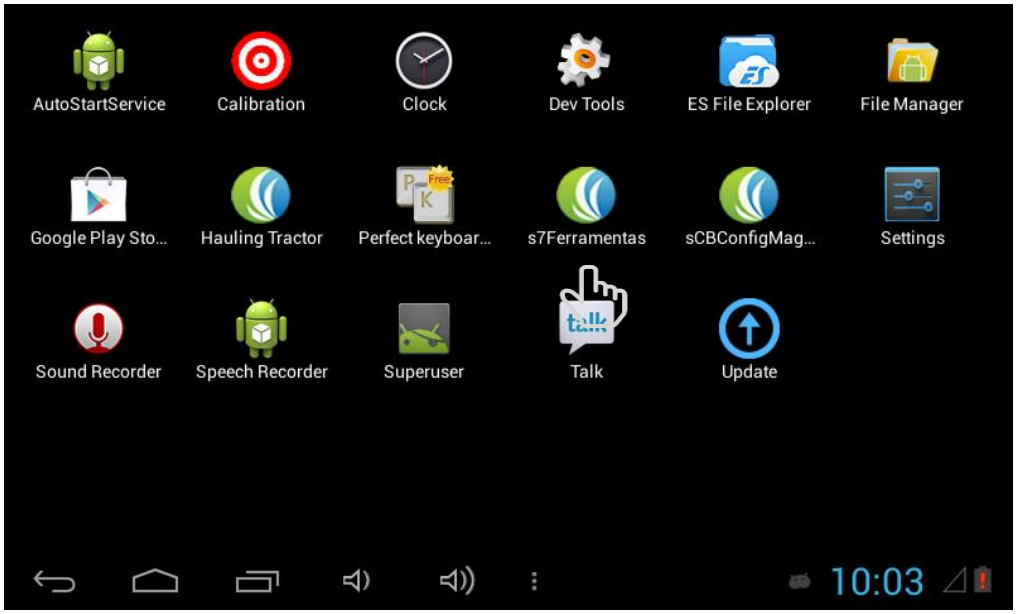
5.3 Update of the files registered on the tablet using a flash drive.

This procedure is used to upload the files registered on the S7 using a flash drive

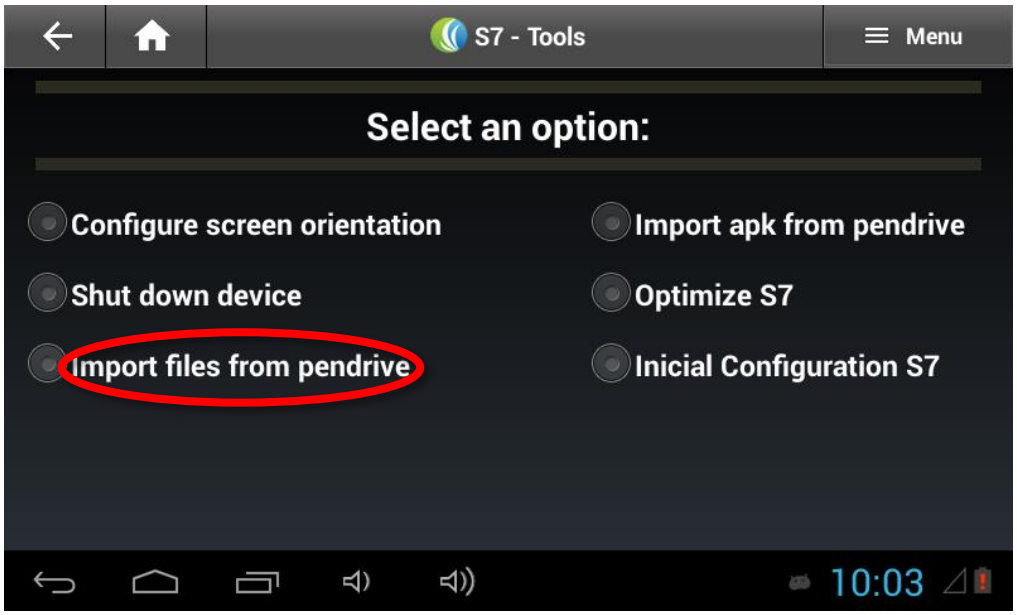
- Firstly, a file with the name “**Cadastros**” must be created on the flash drive. All the registers will be updated there.
- Connect the flash drive using the USB-mini on the serial port on the right side of the S7 tablet.
- Exit the transshipment APK following the steps described on the item ”**2.20 Allow to exit the App**”.
- Access the S7 menu entering the password to enter the configuration area on Android.



- Opening app “**S7Tools**”.



Select the option “Import flash drive file”.



Select the option “**Register**” and click on the option “**IMPORT**”.

- Open the “**sCBTransshipment**” app again and enter on the “**Menu/Configuration”** path option “**Import Records**” .

6. Commands used on the Transshipment remote update

6.1 Parameters that can be updated remotely on the transshipment

The MAG100 Transshipment firmware are ready to receive remote commands to update the parameters already registered by the SGPA:

Command	Description
Update Crate	Update crate records
Update Employee	Register a new employee code on the computer on board.
Update Farm, Field	Register FZT on the computer on board
Update Productive Operation	Register new productive operation code on the computer on board.
Update Unproductive Operation	Register new unproductive operation code on the computer on board.
Update Productive Operation (MAG100)	Register new ´productive operation code on the computer on board MAG100.
Port Lock	Update the lock used for security matters on the (MAG50R)
Start lock	Update the start lock (MAG50R)
Update Unproductive Record	Update the instant stop code of the machine
Text message (64 Characters)	Send text messages to the computer on board up to 64 characters.
Text message Characters (32)	Send text messages to the computer on boar up to 32 characters.
Machine Code	Change the cut code in which the machine is working.

Update Computer on board parameters password	Change the access password to access the computer on board parameters.
Moving Speed	Change the maximum speed allow.
GPRS transmission time	Change the monitoring sending time.
Idle engine time	Change the minimum time for the computer on board to show the idle engine alarm.
Maximum RPM alarm	Change the maximum RPM for the computer on board to generate an alarm.
Maximum Speed Alarm	Change maximum speed for the computer on board to generate an alarm.

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.**

FCC RF Radiation Exposure Statement Caution: To maintain compliance with the FCC's RF exposure guidelines, place the product at least 20cm from nearby persons.