

11.4 CLOCK & DATE

Press the CLOCK & DATE icon to access the settings



11.4.1 MANUAL

The screenshot displays the 'CLOCK & DATE' configuration interface. At the top, the current date and time are shown as '30/01/2019 | 11:20'. The title 'CLOCK & DATE' is centered, and the 'AME' logo is on the right. Below the title, there are two radio buttons: 'MANUAL' (selected) and 'AUTOMATIC'. The 'DATE SETTINGS' section includes three input fields for 'DAY' (30), 'MONTH' (1), and 'YEAR' (2019). The 'TIME SETTINGS' section includes three input fields for 'HOURS' (11), 'MINUTES' (20), and 'SECONDS' (16). To the right of these settings is a numerical keypad with digits 1-9, 0, a back arrow, and a trash can icon. A 'Save Settings' button is located below the keypad. At the bottom left is a 'BACK' button with a left arrow, and at the bottom right is a 'CLOSE' button with a power icon.

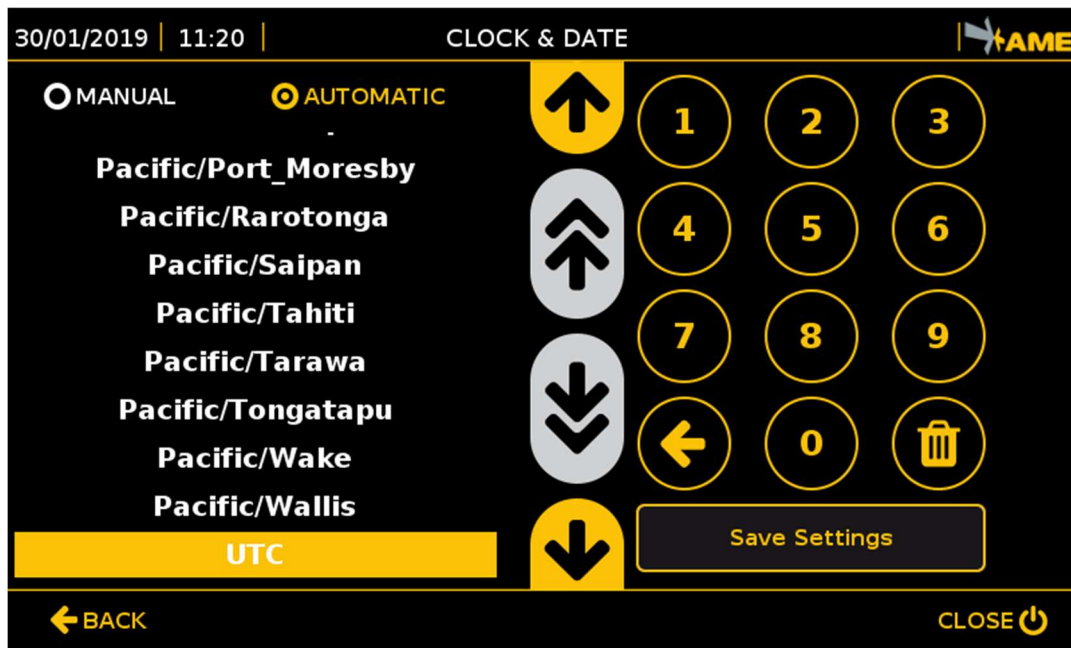
In manual mode, the internal clock of the system must be set by filling in all the fields manually.

On the display, touch the field to be changed and use the numerical keyboard located on the right to delete the old value and set the new one.

1. **'Save settings'**: Key to save the changed settings (to be used at the end of the operations).
2. **'Back'** Key to return to the previous menu without saving the changes.

If the time is changed, the reboot of the CPU will be requested.

11.4.2 AUTOMATIC



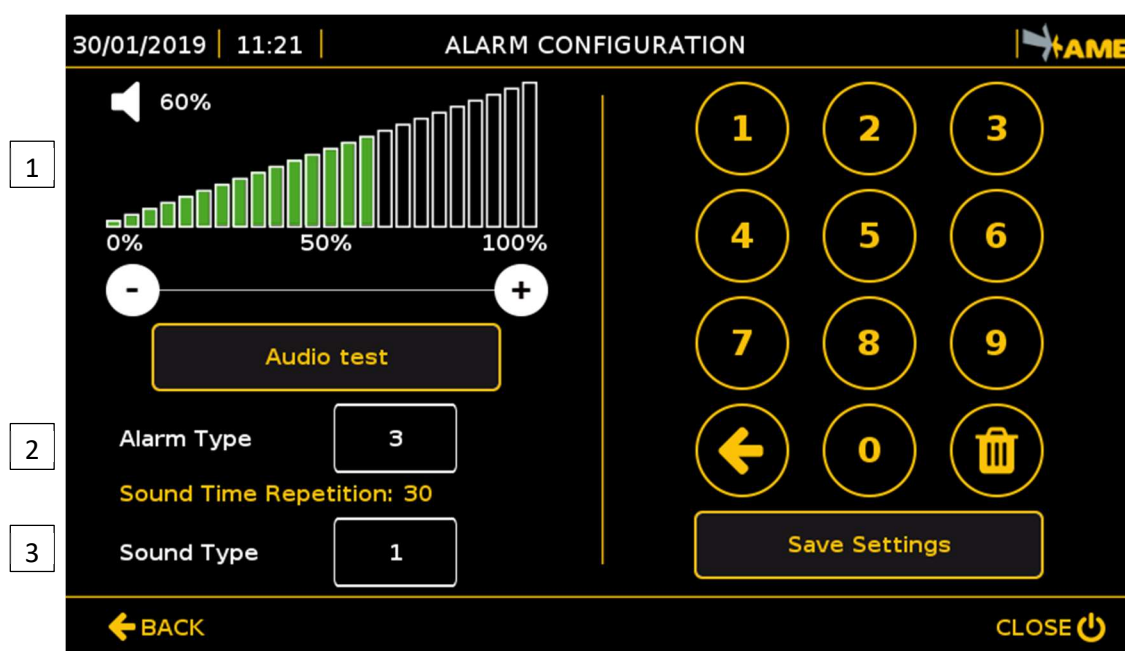
In automatic mode, the internal clock of the system becomes automatically synchronised by means of the network (if available) or the GPS module, if installed.

Use the side arrows to scroll the list and select the correct time zone, the system will update the time automatically.

1. **'Save settings'**: Key to save the changed settings (to be used at the end of the operations).
2. **'Back'** Key to return to the previous menu without saving the changes.

If the time is changed, the reboot of the CPU will be requested.

11.5 ALARM CONFIGURATION



Press the ALARM CONFIGURATION icon to access the settings



The alarm modes are set by means of this interface.

1. VOLUME LEVEL

Press keys and to increase or decrease the volume of the loudspeaker.

- Press '**Audio Test**' to start a test (the 'Tag In' sound and the 'Tag Stay' sound will be reproduced consecutively).
- Press '**Stop**' to finish the test.

2. ALARM MODES

It defines the mode in which the driver is warned about the presence of personnel wearing an active PPE (TAG) within a dangerous area.

The value, between 1 and 5, defines 5 modes referring to the time elapsed between one alarm sound and the next when a dangerous condition remains. The time set is displayed with a message in yellow. (e.g., Sound alarm repetition time: 5)
To set the value, touch the editable field, which becomes yellow, and set a value between 1 and 5.

- Press '**Audio Test**' to start a test (the 'Tag In' sound and the 'Tag Stay' sound will be reproduced consecutively).
- Press '**Stop**' to finish the test.

The five alarm modes are summarised in the table below:

ALARM MODES	SOUND ALARM REPETITION TIME (S)	TAG LAST RECEPTION TIME (S)	TIME THAT THE ALARM REMAINS IN VIDEO (S)	TIME THAT THE ALARM REMAINS IN THE LISTS (S)
1	5	3	3	10
2	15	3	3	30
3	30	3	3	60
4	60	3	5	60
5	1000	3	5	120

3. SOUND TYPE

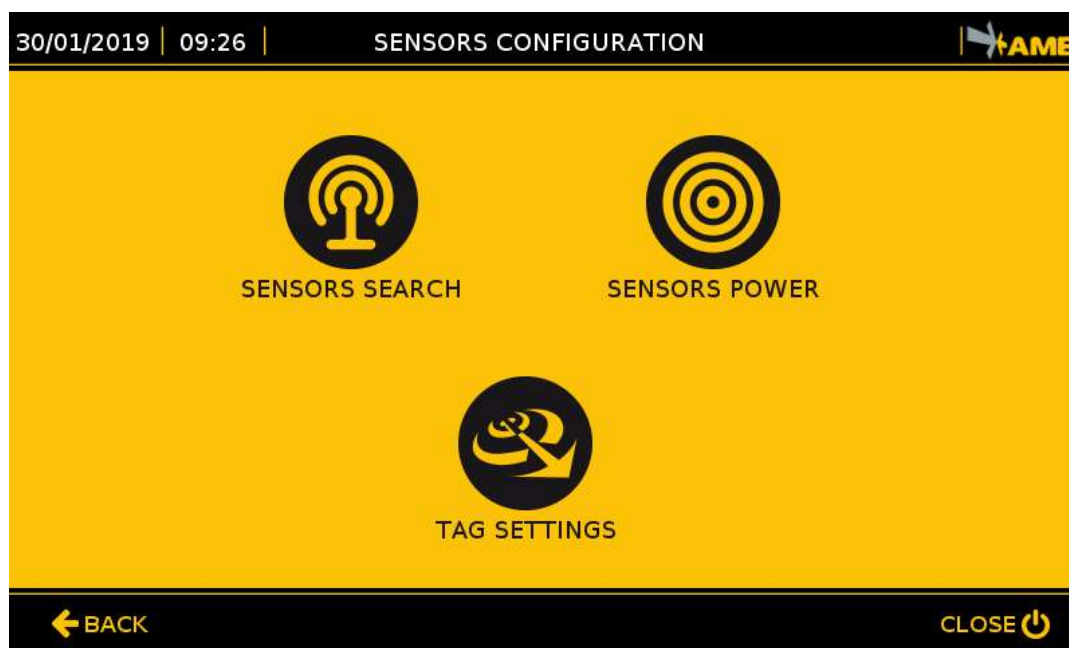
The system manages 2 sound types:

- **Tag In Sound** (Tag detected)
- **Tag Stay Sound** (Tag already present in the activation range)

To set one of the 4 sets of pairs of sounds available, press on the editable 'Sound Type' field and set a value between 1 and 4.

- Press '**Audio Test**' to start a test (the 'Tag In' sound and the 'Tag Stay' sound will be reproduced consecutively).
- Press '**Stop**' to finish the test.

11.6 SENSORS CONFIGURATION



Press the SENSORS CONFIGURATION icon to access the settings



The sensors configuration menu includes 4 STEPS:

- 1. Sensors Search**
Tool to detect and save the sensors fitted.
- 2. Sensors Power**
Tool to set the system operating range.
- 3. Tag Settings**
It configures some parameters on the pedestrian worker's Tag.

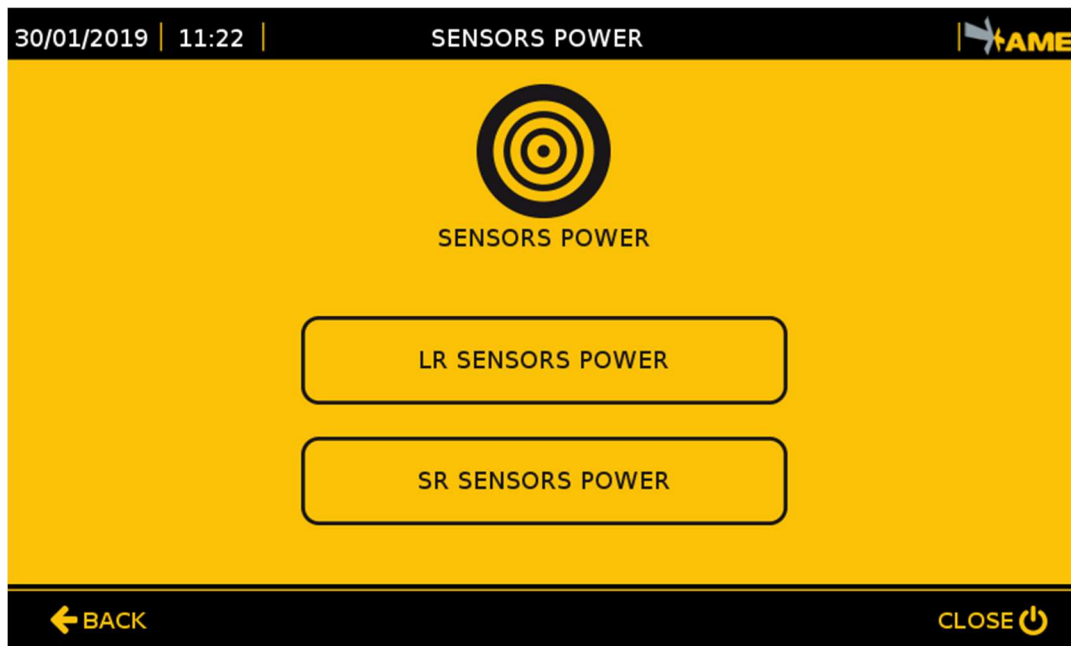
11.6.1 SENSORS SEARCH

Press the SENSORS SEARCH icon to access the settings



See sections 9.2.4, 9.2.5, 9.2.6, 9.2.7.

11.6.2 SENSORS POWER



Press the SENSORS POWER icon to access the settings

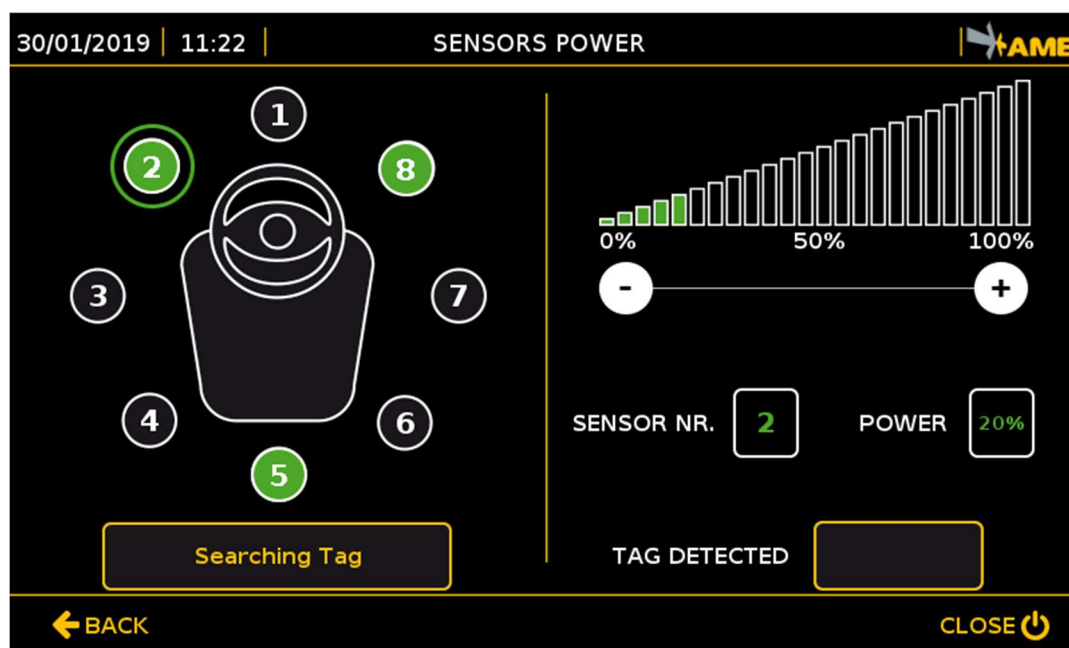


- Select LR SENSORS POWER to configure the Pre-warning alarm range
- Select SR SENSORS POWER to configure the Warning alarm range



Before adjusting the system power, carefully read chapter 8.6: STOPPING DISTANCES.

11.6.3 LR SENSORS POWER



Adjust the LR sensor power to change detection distance of the Tag as well as that of the pedestrian worker in the Pre-Warning area.

In order to change the power of sensors:

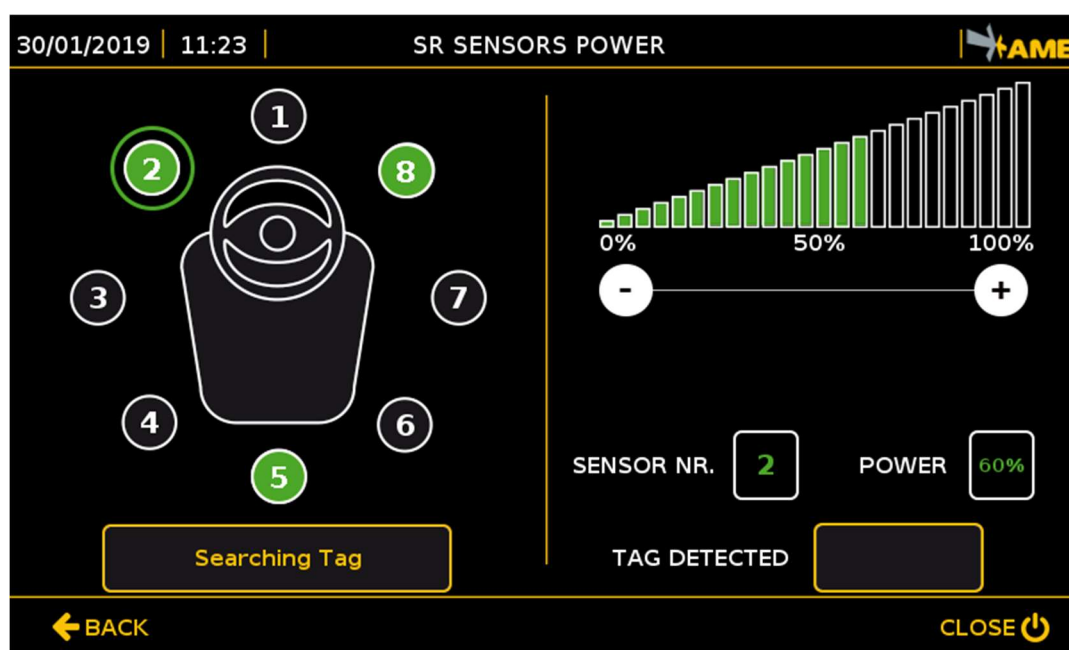
- Select the sensor by pressing the corresponding icon: the selection will be highlighted by a green ring around the icon. In the figure, sensor No. 2 has been selected.
- Once the sensor is selected, the number of the sensor will be shown in the 'SENSOR NR.' field on the right side of the display.
- Change the power of the pre-selected sensor by pressing the and keys to increase and decrease it:
 - Beside the word POWER, the percentage of power set will be indicated. Once set, changes are saved automatically.
- In order to check power in operation, carry out the following operations:
 - Position a Tag at the minimum distance at which the Tag is to be detected (see chapter 8.6). Define the range by means of the and keys, as described above.
 - The Tag code detected will be shown by the phrase TAG DETECTED with a red circle next to it if it is a pedestrian worker's Tag.



- The same operations must be carried out for all the sensors in operation.
- When the sensor is at a 0% power, it is not off, but at minimum power.

NOTE: Use the 'Searching Tag' key every time the power is changed.

11.6.4 SR SENSORS POWER



Adjust the SR sensor power to change the detection distance of the Tag as well as that of the pedestrian worker in the Pre-Warning area.

In order to change the power of sensors:

- Select the sensor by pressing the corresponding icon: the selection will be highlighted by a green ring around the icon. In the figure, sensor No. 2 has been selected.
- Once the sensor is selected, the number of the sensor will be shown in the 'SENSOR NR.' field on the right side of the display.
- Change the power of the pre-selected sensor by pressing the and keys to increase and decrease it:
 - Beside the word POWER, the percentage of power set will be indicated. Once set, changes are saved automatically.
- In order to check power in operation, carry out the following operations:
 - Position a Tag at the minimum distance at which the Tag is to be detected. Define the range by means of the and keys, as described above.
 - The Tag code detected will be shown by the phrase TAG DETECTED with a red circle next to it.



- The same operations must be carried out for all the sensors in operation.
- When the sensor is at a 0% power, it is not off, but at minimum power.

NOTE: Use the 'Searching Tag' key every time the power is changed.

11.6.5 TAG SETTINGS

30/01/2019 | 11:25 | TAG SETTINGS

TAG ALARM (SEC)

2

Save Settings

1 2 3

4 5 6

7 8 9

← 0 🗑️

← BACK CLOSE 🔌

When a pedestrian worker wearing an active PPE enters into a dangerous area around a vehicle, the TAG will be activated and a warning sound with an adjustable intermittent tone will be triggered.

Tag Settings: time, expressed in seconds, that elapses between one sound alarm and the next in the user's Tag, when he is within the detection range of a sensor.

The settable value is a number between 1 and 30 seconds.

To set this parameter, press the editable 'Tag alarm' field and use the numerical keyboard to enter the value preferred.

At the end of the operation, press the '**Save settings**' key to save settings.



- This function is available only in TAG SAFETY 02 version (PLXTAGSAFETY02).

11.7 LANGUAGE

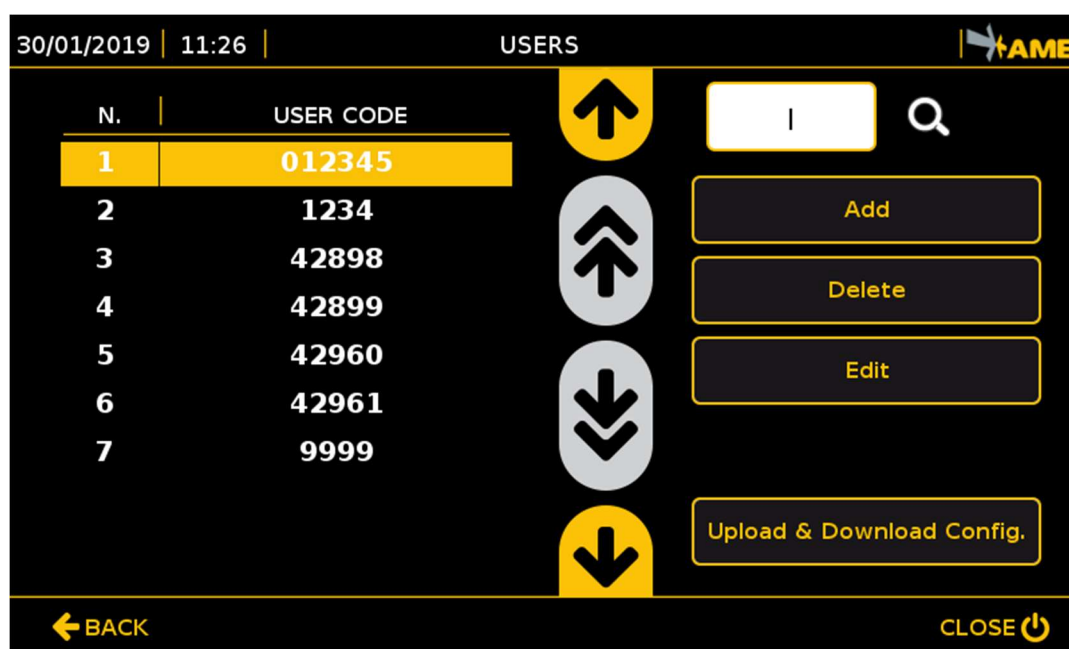


Press the dedicated key to select the language chosen.

These are the settable languages:

1. Italian
2. English
3. French
4. Spanish

11.8 USERS



The Users section shows the codes of the Tags that were entered into the system master data for login and logout (section 10.5).

To change the master data and see the users' codes, log in as an administrator. The default code for administrators is 9999.

In this section, you can use:

- The **'Add'** key to enter a new Tag into the master data.
- The **'Upload & Download Config.'** key to export or import the configuration of all users

To change or delete the code, select a Tag from the list on the left and press, respectively:

- The **'Delete'** key to eliminate a Tag from the master data.
- The **'Edit'** key to change the data of the Tag selected in the master data.

By means of the search window on the top left corner, you can enter a user code (even partially) and search for it without scrolling the list of all users.

NOTE: the software is supplied with 2 User Codes enabled:

User Code	Password	User	Level
9999	1234	Administrator	4
1234	5678	Operator	1

11.8.1 ADDING/EDITING USERS

Fill in the following boxes for master data to add or edit a user:

'User code' Enter the code to be associated to the Tag to be used to log in. The user code will be the code saved and displayed in the file of events.

'Level' The level types that can be entered are 1 and 4.

- 1 Operator Level
- 4 Administrator Level

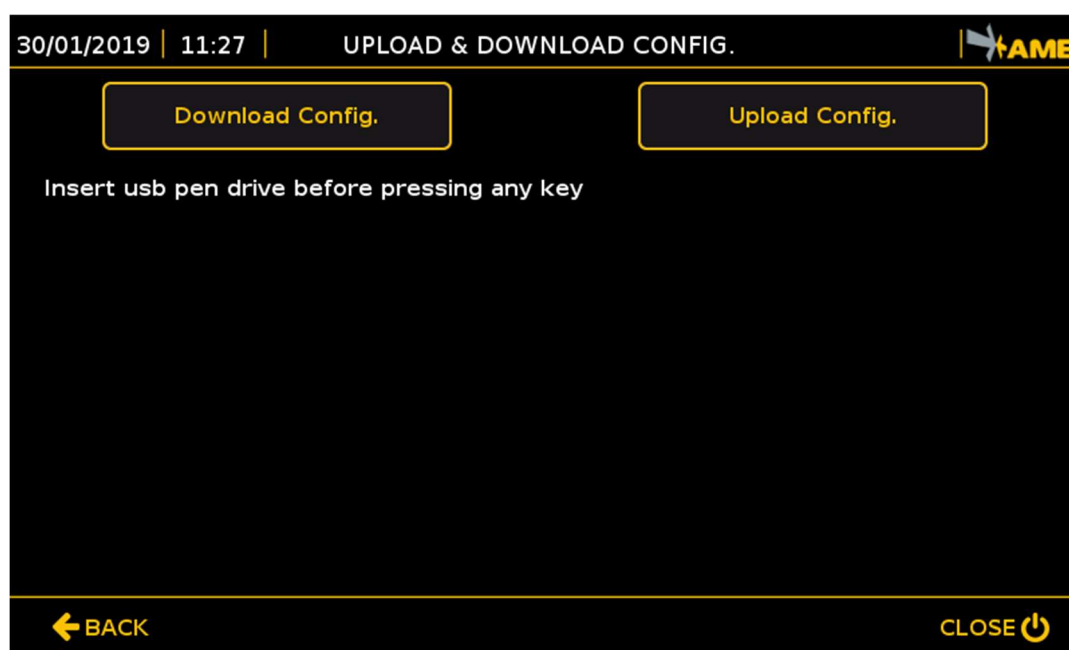
'Tag Code' Enter the Tag code shown in the label on the transponder.

NOTE: Associate the Tag code to the same user's code so that they match in the data/events analysis.



Immediately after the driver logs in, every operation detected by the system will be automatically associated to the driver's User Code.

11.8.2 IMPORTING/EXPORTING USERS



All users can be configured in a system, and then, by means of these functions, the list of users can be copied to the remaining systems without having to enter the users in all vehicles manually.

'Download Config.' This is used to export the list of the users present on the vehicle to a USB key.

'Upload Config.' This is used to import the list of users from a USB key.



Before importing all the data of users, they will be deleted from the database of the EGOpro Safe Move system.

The list of users is saved in the 'MoveDB.csv' file. 'csv' files are delimited text files that use a semicolon to separate values.

File example:

```
USERNAME;PASSWORD;LEVEL;DATE_CREATION;DATE_MODIFY;LAST_LOGIN;CODE_TAG;CODE_BADGE
111111;;1;09/04/2018;09/04/2018;09/04/2018;111;16451
1234;5678;1;07/05/2013;17/04/2018;04/05/2018;;0417C48C58
12345;;1;30/03/2017;30/03/2017;30/03/2017;12345;4C00DD0A84
9999;1234;4;07/05/2013;01/04/2014;14/01/2019;;
```

- USERNAME: min. 4 digit, max. 6 digit, numerical [**MANDATORY**]
- PASSWORD: max. 8 digit, numerical [**NOT MANDATORY**]
- LEVEL: possible values 1,2,3,4 (1 digit) [**MANDATORY**]
- DATE CREATION: date in the dd/MM/yyyy format [**NOT MANDATORY**]

- DATE MODIFY: date in the dd/MM/yyyy format [NOT MANDATORY]
- LAST LOGIN: date in the dd/MM/yyyy format [NOT MANDATORY]
- CODE TAG: max. 6 digit, numerical [NOT MANDATORY]
- CODE BADGE: alphanumeric [NOT MANDATORY]

NOTES:

- The username field must be unequivocal, and it is used to log in.
- In case of automatic login, use the TAG code as username
- If login without password is used, the password does not have to be entered.

NOTES ON FILE STRUCTURE:

The data to be imported by means of the automatic procedure must be formatted with the following structure:

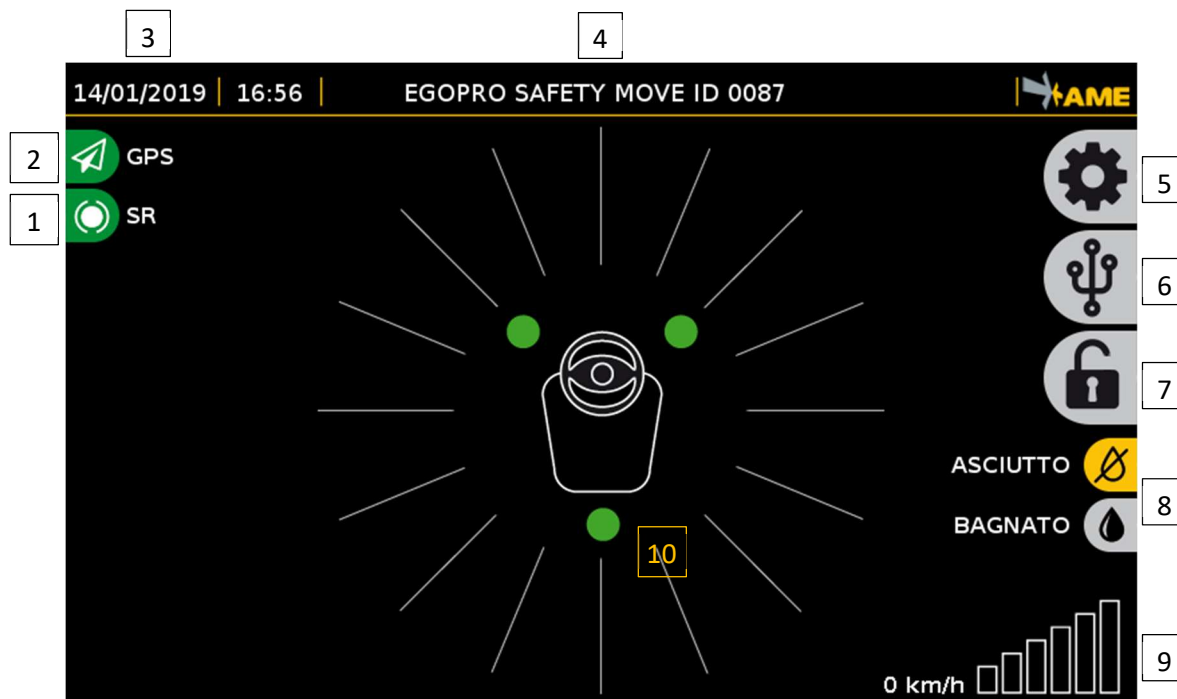
- first line of heading:
USERNAME; PASSWORD; LEVEL; DATE_CREATION; DATE_MODIFY; LAST_LOGIN; CODE_TAG; CODE_BADGE
- it must contain 8 fields in each line (any additional fields will be ignored);
- the fields not to be included must be empty (no spaces);
- the elements must be separated by a **semicolon (;)**.

12 OPTIONAL MODULES

All additional modules must be installed on the vehicle and activated, with a special software license. Additional modules are already activated in the system at the time of purchase. An authorised technician is required to activate any additional licenses.

12.1 DISPLAY OVERVIEW WITH ACTIVE MODULES

Main screen of an EGOp Pro Safe MOVE 4.0 with optional modules activated.



1. Status of the Warning detection
2. Icons indicating the status of modules acquired by the customer:
Red: the system must be checked (not active)
Green: The system operates correctly (active)
3. Date and time
4. System Identification Code
5. Key for login
6. Key to access configurations/settings
7. Key to access the section for data/log downloading
8. Selection of ground condition: wet or dry
9. Vehicle speed indication
10. Position and status of the sensors installed. In this case, the three sensors, represented with a green circle, are arranged as follows: two at the front and one at the rear. The green colour indicates the correct operation of each sensor.

12.2 NON-ACTIVE MODULE ALARM



On the left side of the display, only the status icons for the different modules acquired by the user are shown.

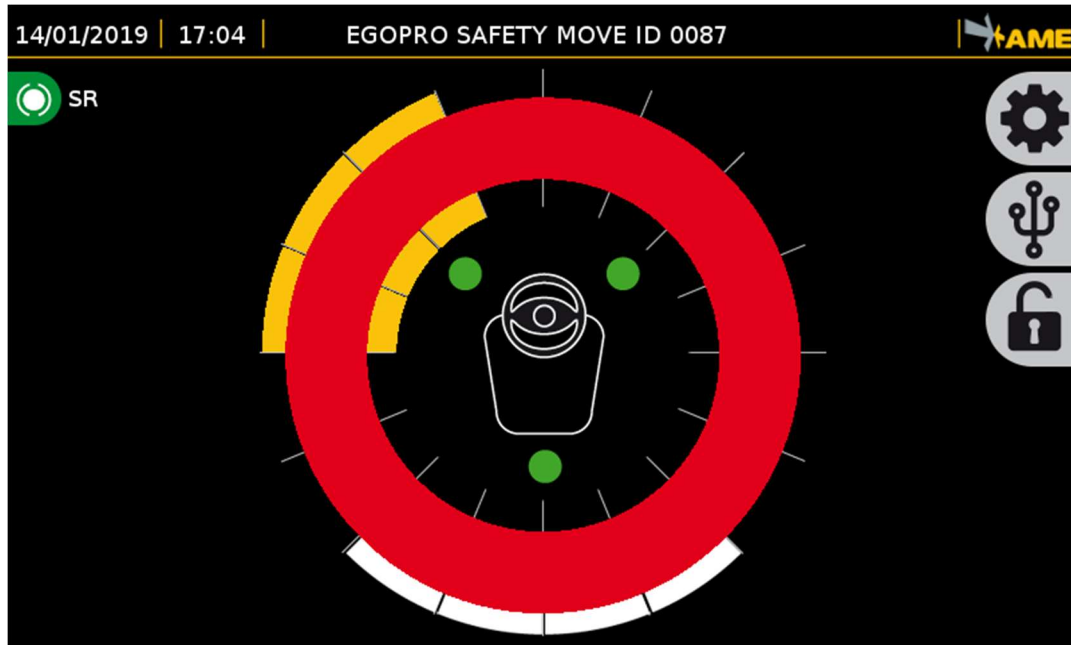
The icon of the modules can be red or green, depending on the status of the module. The icon status for each module will be explained further on in the manual.

13 VEHICLE-VEHICLE ANTI-COLLISION MODULE

13.1 INSTALLATION

The vehicle-vehicle anti-collision module is integrated in the PLX SAFEMOVE SENS 4 sensor, and it does not require any additional installations.

13.2 ALARM VISUALISATION

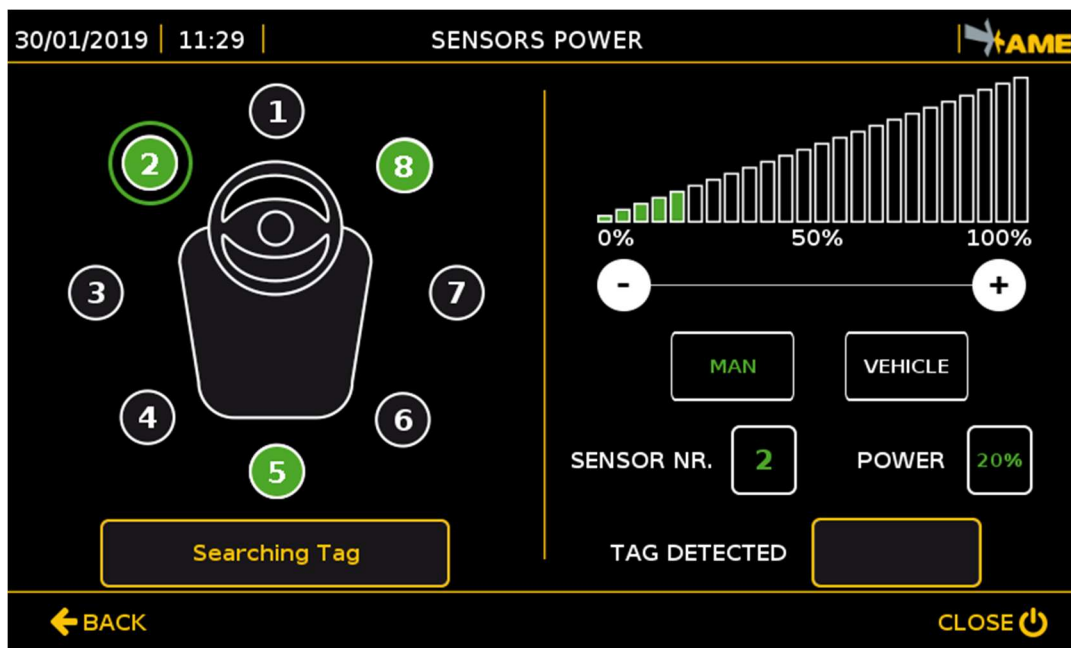


The vehicle-vehicle anti-collision module detects not only the pedestrian worker moving around the vehicle, but also other vehicles equipped with the specific EGOpro Safe MOVE 4.0 sensors.

In this case, there are three visual alarms:

- **WHITE:** it warns about the presence of other vehicles equipped with the EGOpro Safe MOVE system in a dangerous area around the vehicle. The direction from which the other vehicle is coming is indicated by the sectors. For example, in the figure, the second vehicle is behind the driving position.
- **YELLOW:** it warns about the presence of personnel wearing a Tag in the Pre-warning area around the vehicle.
- **RED:** it warns about the presence of personnel wearing a Tag in the Warning area near the vehicle.

13.3 SENSORS POWER



In this section, the sensor power, and thus the detection distance of both the pedestrian worker's Tag and the vehicle's Tag, can be changed.

To configure the sensor power with respect to the vehicle's Tag, press the 'VEHICLE' key, and carry out all the same operations performed for the pedestrian worker's Tag (section 11.6.3).

In order to check power in operation, carry out the following operations:

- Position a Vehicle at the minimum distance at which it is intended to be detected, when both vehicles are stopped (See chapter 8.6 for calculating the minimum distance).
- Select the sensor to be configured.
- Define the range by increasing or decreasing the power by means of the and keys in this menu until the other Vehicle is detected.
- Once set, changes are saved automatically. The Vehicle code detected will be shown by the phrase 'TAG DETECTED' with a white circle. The code of each Vehicle is shown at the top on the main screen.
- Taking into account the space that is necessary for braking, make sure that the presence of other vehicles is detected even when they are not moving.



- The same operations must be carried out for all the sensors in operation.
- When the sensor is at a 0% power, it is not off, but at minimum power.
- Both powers, man and vehicle, are independent

NOTE: Use the 'Searching Tag' key every time the power is changed.

14 FILTER MODULE

The filter sens (P LX FILTER SENS), or inhibitor, is a device used to delimit a zone within which, in accordance with the client's safety needs, the tags are temporarily disabled.

This device is found in the cabin of the vehicle; in this way, the driver can wear a Tag while driving without being detected by the system. The Tag is reactivated 3 seconds after the driver is out of the range of the device so that the driver is automatically safe (for example, when he gets out of the vehicle).

14.1 INSTALLATION

The inhibitor must be installed in the cabin.

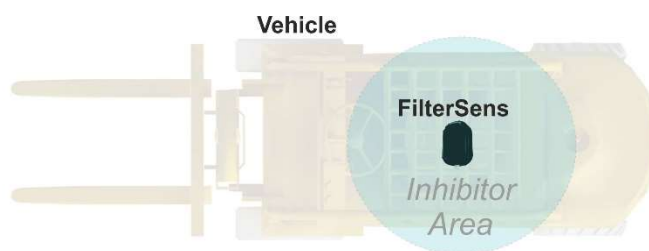
The technology used by the device allows creating an inhibition zone of up to 4-m radius within which the TAGs will be inactive.

For this reason the device must be placed centrally in the vehicle and very close to the TAGs worn by the driver. The radius of action range of the device (power) can be set to the minimum necessary in order to minimize the inhibition zones outside of the vehicle.



Check if there are devices such as 125kHz badge readers.

They may interfere with the operation of the filter module. If necessary, adjust the position of one of the two devices in order to reduce interference.

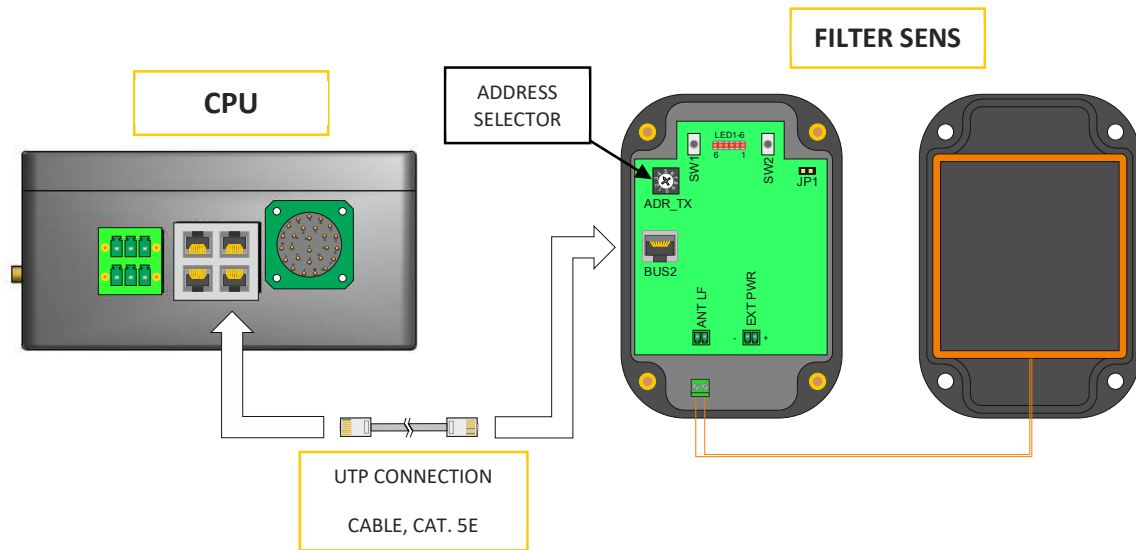


Use the mechanical joint supplied to fix the device or remove the fixing bracket from the device, and fasten it to the surface using double-sided tape (e.g., **3M Dual Lock™** reclosable fastener).

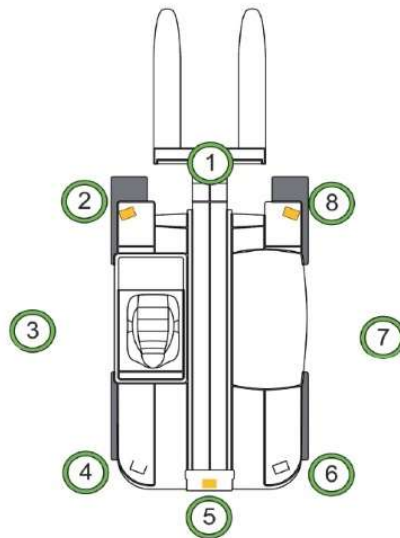


14.2 CONNECTIONS AND HW CONFIGURATIONS

The connection requires only one UTP cable, Cat. 5E or higher (LAN) between the device and one of the free 'Sensor' ports in the CPU of the system.



The device address selector must be set to the same position (address) as one of the anti-collision sensors in the system according to the diagram below.



14.3 VISUALISATION



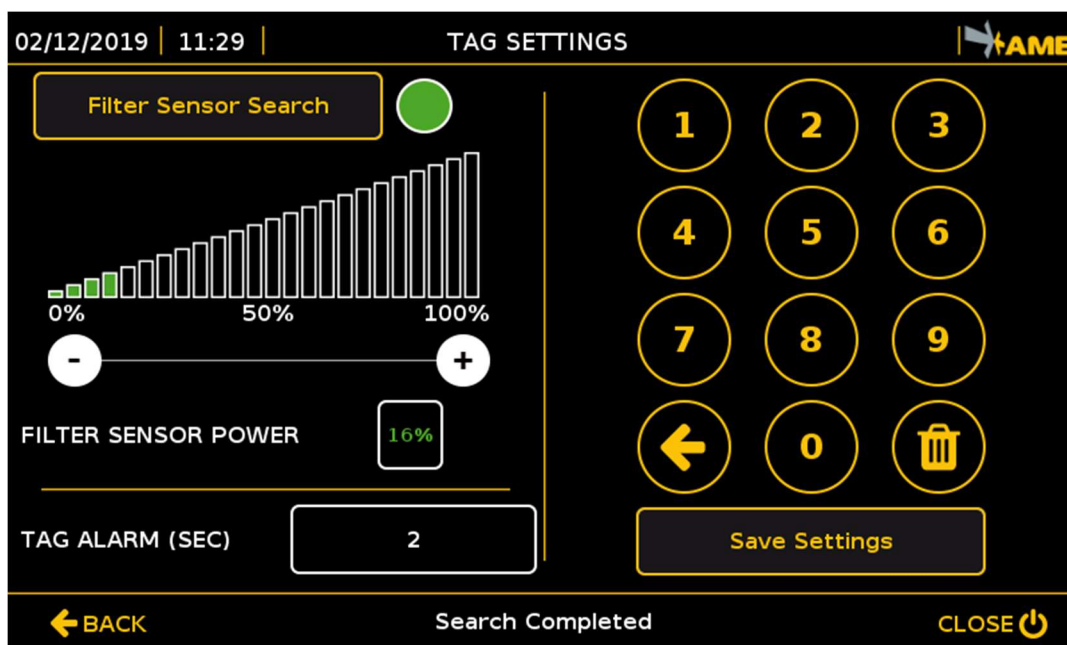
The icon of the Filter module is green: the module is working. The number next to the icon indicates the number of Tags that have been temporarily disabled. To reactivate them, exit the sensor activation zone and wait for 3 seconds.



The icon of the Filter module is red: the module is not functioning or the communication between the system and the module is interrupted. Check the connection to the CPU.

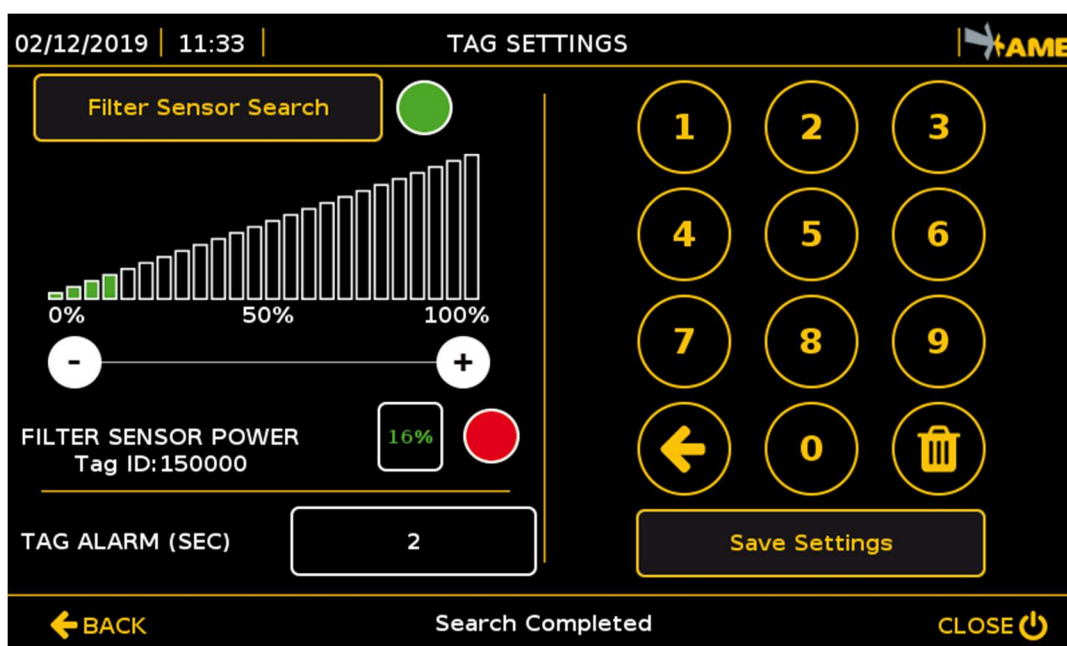
14.4 CONFIGURATION

To modify the range the module covers of the module, access the configuration menu 'SENSORS→TAG SETTINGS' (see section 11.6).



To configure the Filters Sens module, do as follows:

- Press the '**Filter Sensor Search**' key to associate the sensor to the System. If the module is correctly recognised, the icon will become yellow. Then press 'Save Settings' and the icon will become green.
- Use the and keys in the menu to increase or decrease the activation range of the device.
- If a TAG is detected, and therefore temporarily disabled, the code associated is displayed at intervals of about 2 seconds under the legend 'FILTER SENSOR POWER'.



14.5 AUTO LOGIN

The AUTO LOGIN allows any worker wearing a Tag to login automatically. To enable the AUTO LOGIN function, the Filter Sens module must be installed and operational.



Press the yellow login icon to run the AUTO-LOGIN function. If the system detects only one TAG, the code is displayed and then, after 3 seconds, the screen goes back to the main monitor.

User registered in the system.

To LOGOUT, press the grey icon and turn off the system.



- The AUTO LOGIN is active only if the Tag has been previously associated to a user (see section 11.8).
- If there are several Tags within the activation area of the Filter Sens, the AUTO LOGIN will not be enabled.
- If no TAGs are detected, the timeout is 1 minute.

15 BADGE MODULE

You can also log in to the system by means of the badge reader external to the system.

The driver is automatically identified and LOGS IN immediately after passing the badge over the reader connected to the system.

15.1 INSTALLATION

Two (2) different types of readers can be installed: a serial reader and a USB reader for 125kHz/13.56MHz cards.



Check if there are any devices such as other 125kHz/13.56MHz badge readers or the Filter Sens module. They may interfere with the operation of the badge module. If necessary, adjust the position of the devices in order to reduce interference.

15.1.1 SERIAL READER

The code of the serial reader is 904.300.17 for 125 kHz RFID or 904.302.14 for ISO14443 A/B & ISO15693 RFID. Connect this reader to the RS232 connector shown in section 8.3.2.

15.1.2 USB READER

The code of the USB reader is RDR-80581AK0; it can be connected to one of the USB ports available in the CPU.

15.2 VISUALISATION



When the system is turned on, the main interface presents a lateral red message inviting the user to LOGIN, which is signalled by a yellow icon.

Press the yellow login icon- a closed padlock- to login, and enter your driver's code/Tag code. Once the login is complete, the icon will become grey, the symbol will turn into an open padlock, and the login word in red will disappear.



For the LOGOUT operation, press again the grey icon and it will be yellow again.





The LOGOUT operation is essential to be able to make the driver's Tag visible again for the anti-collision system.

When the system is turned off, the LOGOUT operation is automatically performed.

15.3 BADGE ASSOCIATION

N.	USER CODE
1	012345
2	1234
3	42898
4	42899
5	42960
6	42961
7	9999

Navigation arrows: Up, Up+Down, Down+Down, Down

Buttons: Add, Delete, Edit, Upload & Download Config.

Bottom: BACK, CLOSE

In order to log in with the badge, the Tag must be associated to the badge.

Go to the user section in the configuration menu in order to view the master data of the Tags.

- **Add** to enter a new Tag
- **Delete** to delete a Tag
- **Edit** to change a Tag already entered into the master data or to associate a badge to a Tag already entered.
- **"Upload & Download Config."** to export or import the configuration of all users

02/12/2019 | 11:39 | NEW USERS |

USER CODE

LEVEL

TAG CODE

BADGE

Save Settings

BACK Username must be at least 4 digits CLOSE

In the Edit or Add section, follow these operations to associate a Tag to the badge and to log in with the badge reader:

1. Pass the badge over the reader and the ID will appear at the bottom on the left side of the display under the word BADGE.
2. Select the TAG CODE and enter the number of the Tag indicated on the Tag label.
3. Select the LEVEL following the instructions in section 11.8.
4. Select the USER CODE; enter the code to be associated to the Tag to be used to LOGIN if you do not have the badge. The user code will be the code saved and displayed in the file of events.
Assign the same codes for the Tag code and the User code.
5. Click on '**Save Settings**' to complete the association step.

The same operations must be carried out for all the badges used.

16 TRACKING ADAPTIVE RANGE MODULE

The 'Tracking Adaptive Range' function, or the adaptive function, automatically adapts the detection distance (range) according to the speed of the vehicle.

It is a software module to be combined with a hardware module to acquire the speed of the vehicle.

The hardware modules that acquire the speed of the vehicle are:

- GPS MODULE (see chapter 17)
- INDOOR SPEED MODULE (see chapter 21)

NOTE: Both the indoor speed sensor and the GPS can be fitted.

16.1 VISUALISATION



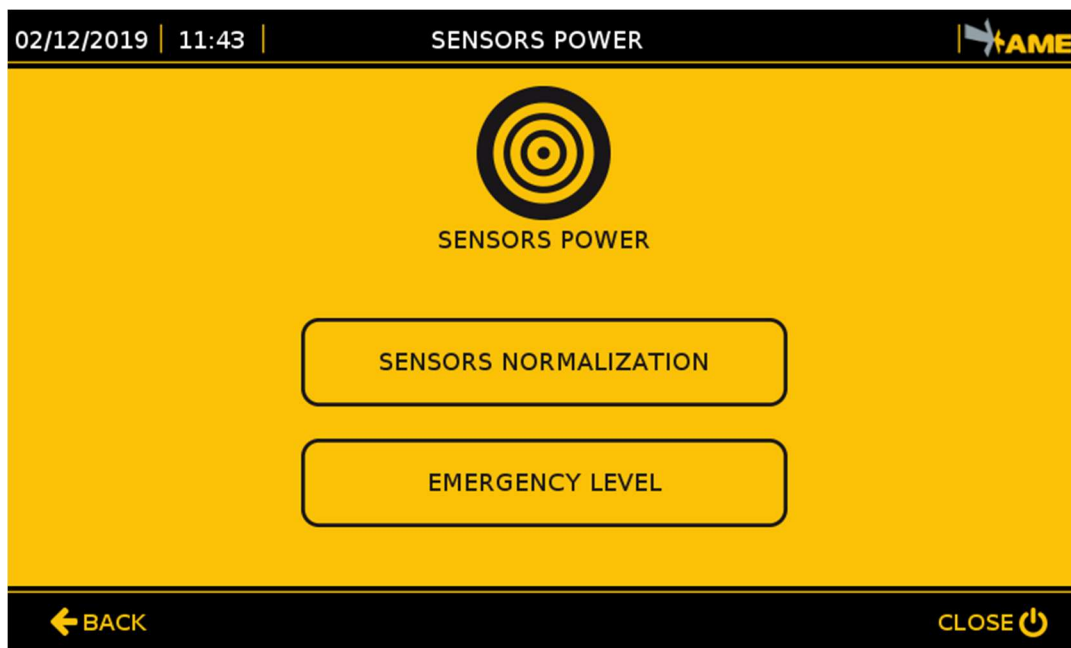
In order to make the adaptive function more reliable, the driver must access the system, control the conditions of the ground, and select one of the two options:

-  Wet: it must be selected when the ground is wet.
-  Dry: it must be selected when the ground is dry.

NOTE: The option that is active is highlighted in yellow.

The system shows the vehicle speed in km/h at the bottom right. The indicator to the left of the speed shows the current speed compared to the maximum speed allowed under the selected ground conditions.

16.2 ADAPTIVE SENSOR POWER



The power of the sensor is adjusted depending on the speed, and is determined as the sum of two components:

- **Fixed part - 'Sensors normalization':** it is the minimum power value, used when the vehicle is at standstill (speed = 0 km/h).
- **Increase:** it depends on the speed of the vehicle. It is added to the normalization.

To configure the adaptive function, configure the settings in the 'SENSORS POWER' sub-menu in the 'SENSORS' menu (section 11.6).

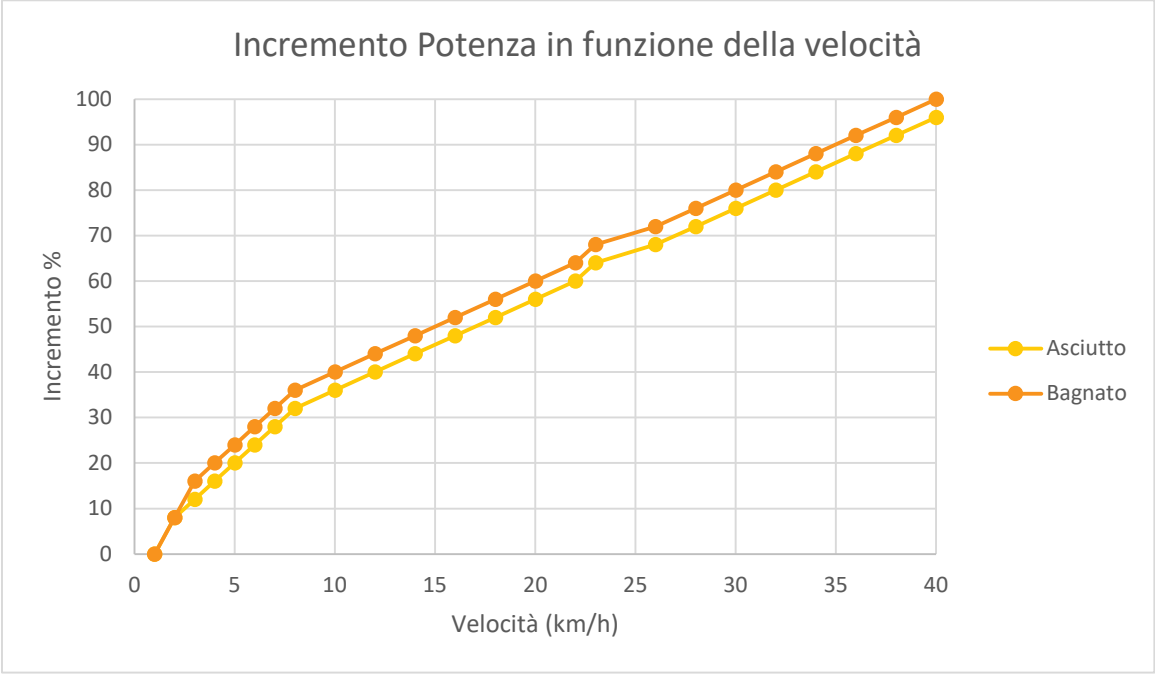
These are the options available in the 'SENSORS POWER' sub-menu:

- **Sensors normalization**
It defines the detection distance when the vehicle is at a standstill (speed=0 km/h).
- **Emergency level**
It defines the detection distance if the system CANNOT establish the speed of the vehicle.

The power of the Long range sensors is defined as explained in the other sections of this manual, with a level from 0 to 100%. The dynamic power adds a value to the power level compared to vehicle speed. A 24-step increase in power leads to almost twice the distance.

The increase values, for both ground conditions, are shown in the table below.

<i>Speed Range (km/h)</i>	Power level increase (step %)	Power level increase (step %)
	DRY mode	WET mode
1	0	0
2	8	8
3	12	16
4	16	20
5	20	24
6	24	28
7	28	32
8	32	36
10	36	40
12	40	44
14	44	48
16	48	52
18	52	56
20	56	60
22	60	64
23	64	68
26	68	72
28	72	76
30	76	80
32	80	84
34	84	88
36	88	92
38	92	96
40	96	100

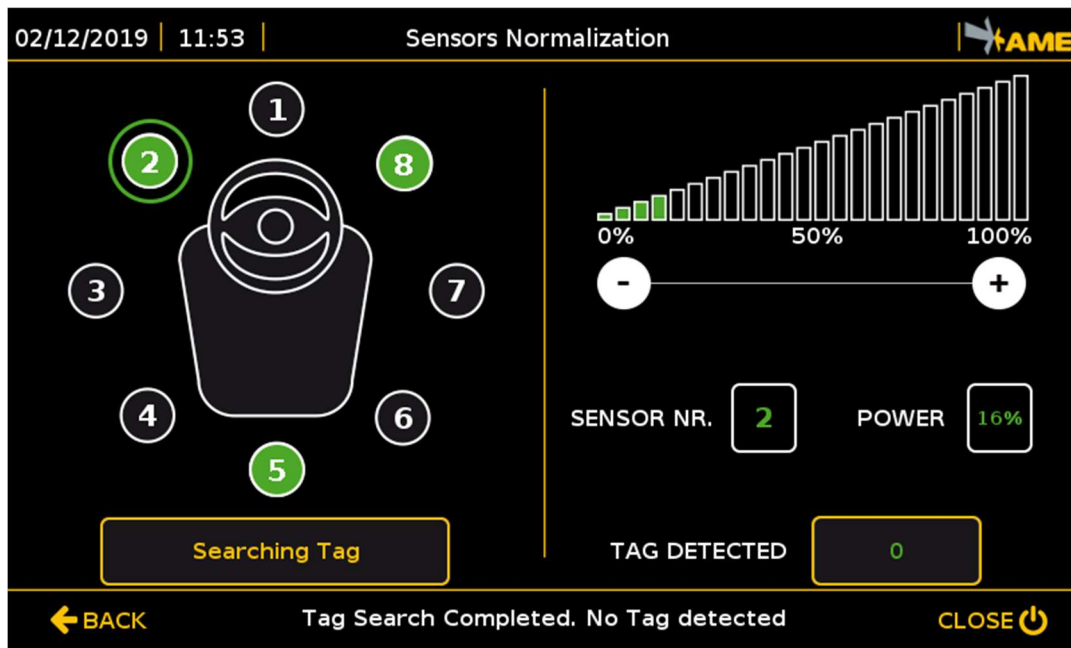


For example:

Normalization	Speed	Dry power	Wet power
12%	4 km/h	12+16=28%	12+20=32%

See chapter 8.6 for the ratio between sensor power and detection distance.

16.2.1 SENSORS NORMALIZATION



The '**Sensors normalization**' function defines the detection distance when the vehicle is at standstill (speed=0 km/h).

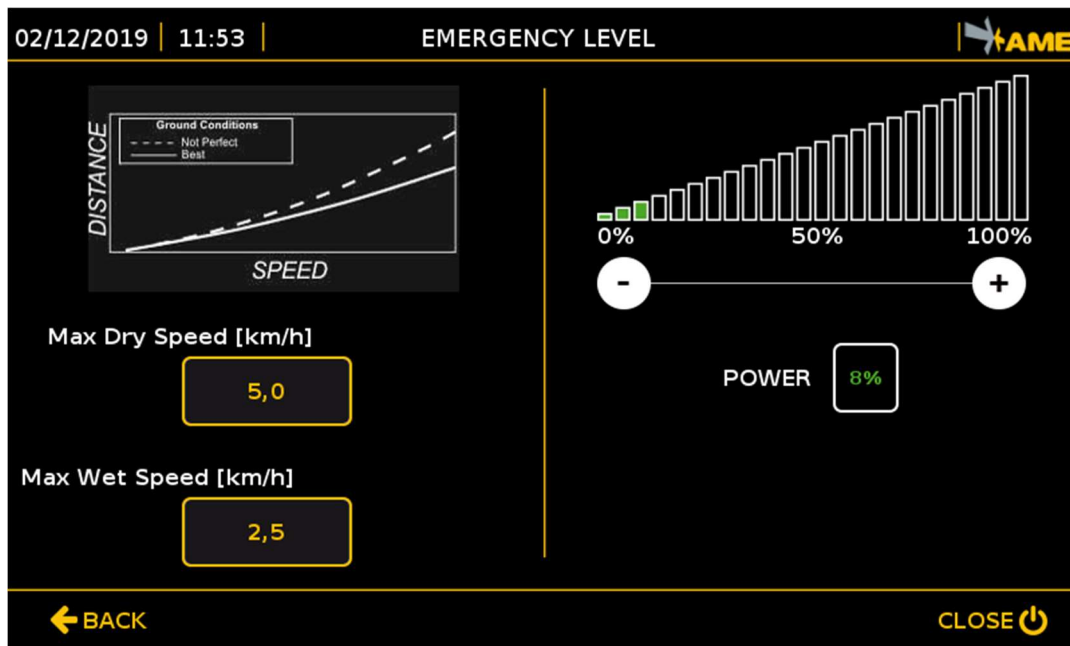
In order to set the power level (range) or the detection distance, carry out the following operations:

- Position a Tag at the minimum distance at which it is intended to be detected when the vehicle is at standstill.
- Select the sensor to be configured
- Define the range by increasing or decreasing the power by means of the  and  keys in this menu until the Tag is detected. Once set, changes are saved automatically.

Carry out the same operations for all active sensors.

NOTE: Use the 'Searching Tag' key every time the power is changed.

16.2.2 EMERGENCY LEVEL



The '**Emergency level**' function defines the maximum speed and the detection distance automatically if the system CANNOT establish the speed of the vehicle. (e.g., when the satellite coverage is not enough or there is a GPS module failure).

To set the emergency level or the maximum speed of the vehicle, use the and keys on the right of the display.

When the (adjustable) power of the sensor is changed, on the left side, the maximum speeds allowed will vary in the two ground conditions expected at the 'Emergency Level' regime.

At this point, the maximum speed of the vehicle can be set by setting the sensor power.



If the speed is acquired via the GPS module, the emergency level condition is always shown when the system is turned on and as long as the GPS module needs to stabilise.

17 GPS MODULE

In order to have this module available, the CPU must be in GPS mode.

By means of this device, the system can detect the speed and the position of the vehicle. The speed is necessary to enable the ADAPTIVITY function. The position and speed of the vehicle, if available, are saved in the TAG detected events.

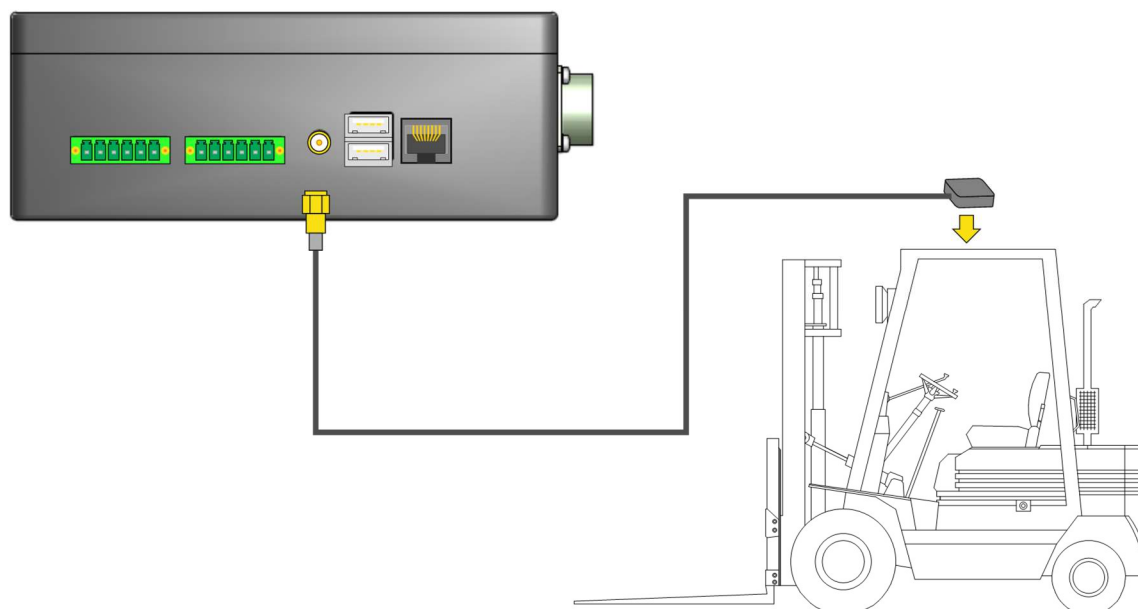


GPS Antenna
Code TOP-GPS01

17.1 INSTALLATION

The GPS module includes the antenna that must be fitted correctly on the vehicle. The antenna is equipped with a fixing magnet and can be anchored to any ferrous surface. The recommended position is on the roof of the vehicle in order to maximise satellite reception.

The antenna must then be connected to the 'GPS' connector of the CPU.



17.2 GPS VISUALISATION



The icon of GPS module is green: the system is receiving data from the GPS antenna.



If the icon of the GPS module is red: the system is not receiving the signal from the GPS antenna or the GPS signal is interrupted.



- When the system is turned on, it will take the GPS at least 120 seconds to receive the signal correctly, so the icon will remain red for the first minutes.
- If the antenna is not fitted, the icon will be always red.
- The GPS signal does not always have the same coverage, especially in indoor areas.
- If the signal is not reliable (insufficient number of satellites), the icon becomes red.

18 AISLE MODULE

Find below the codes associated to this module.

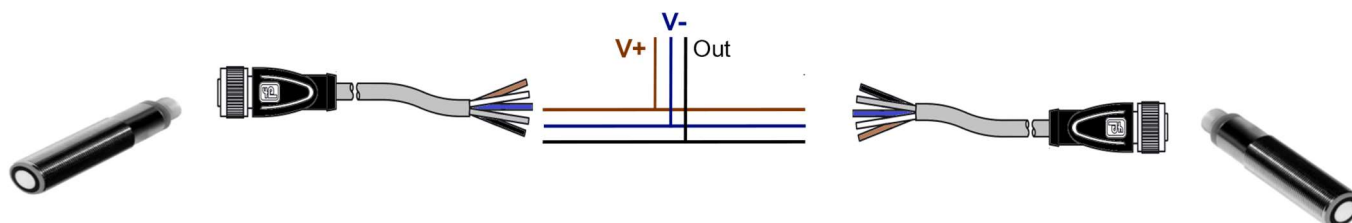
Code	Quantity	Description
GECMPPF204530	3	UB1000 Ultrasonic sensor
GECMPPF116454	2	5-pole M12 cable for ultrasonic sensor; 10 m
SWAISLE	1	Software module

The AISLE module includes the proximity sensor that must be fitted correctly at the sides of the vehicle. With this device, the system can capture information if the vehicle is, for example, inside the aisle of the warehouse, and therefore, visibility is poor.

18.1 INSTALLATION

Connect the cables supplied to the two sensors on both sides of the forklift truck.

Connect the cables according to the description explained, and connect the two sensors in parallel.



Sensor PIN	Function	Cable colour	Connect to
1	V+	brown	Voltage +Vq (under CPU panel) 24Vdc max
3	V-	blue	CPU power negative pole (GND)
4	Out	black	CPU C1 or C2 input (I/O connector)

For further functions and for programming the sensor, refer to the manual included in the package.

18.2 VISUALISATION



When the vehicle is in AISLE mode, the system automatically increases or decreases the range of activation of the sensors (depending on how the module was configured when the license was activated).



The icon of the AISLE module is green: the system is receiving data from the sensor, and the vehicle is in the aisle, so the AISLE function is activated.

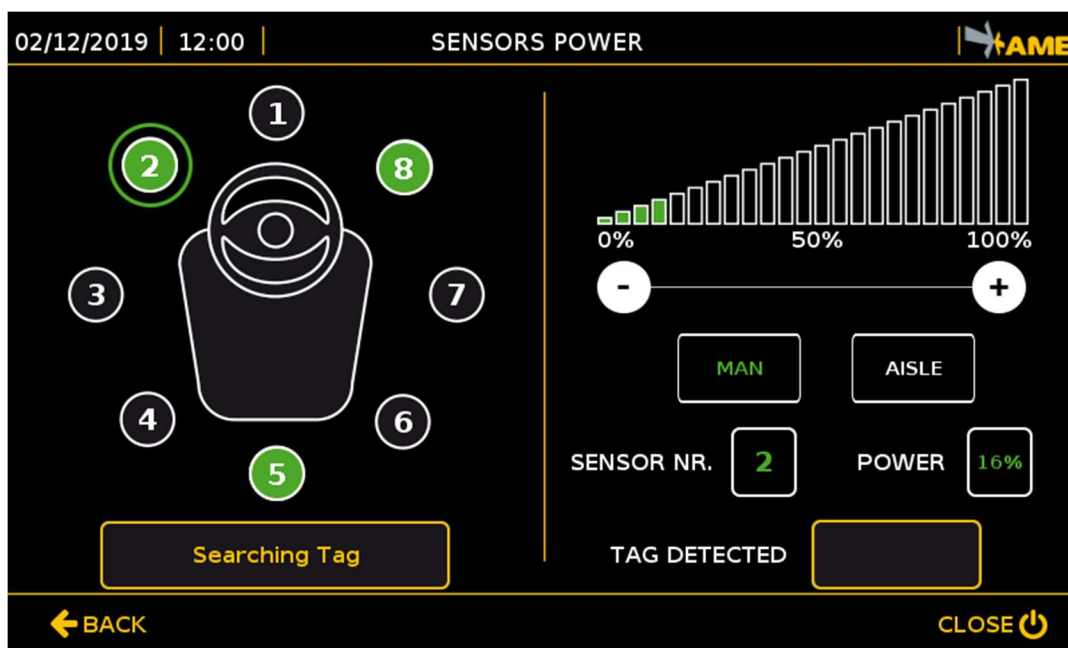


The icon of the AISLE module is red: the system does not detect that the vehicle is in the aisle, and therefore, the automatic function to increase or decrease the detection range is not active.



When the AISLE function is active, it modifies the Pre-warning range and the vehicle-vehicle range (if installed). The Warning module range is fixed.

18.3 AISLE POWER SETTING

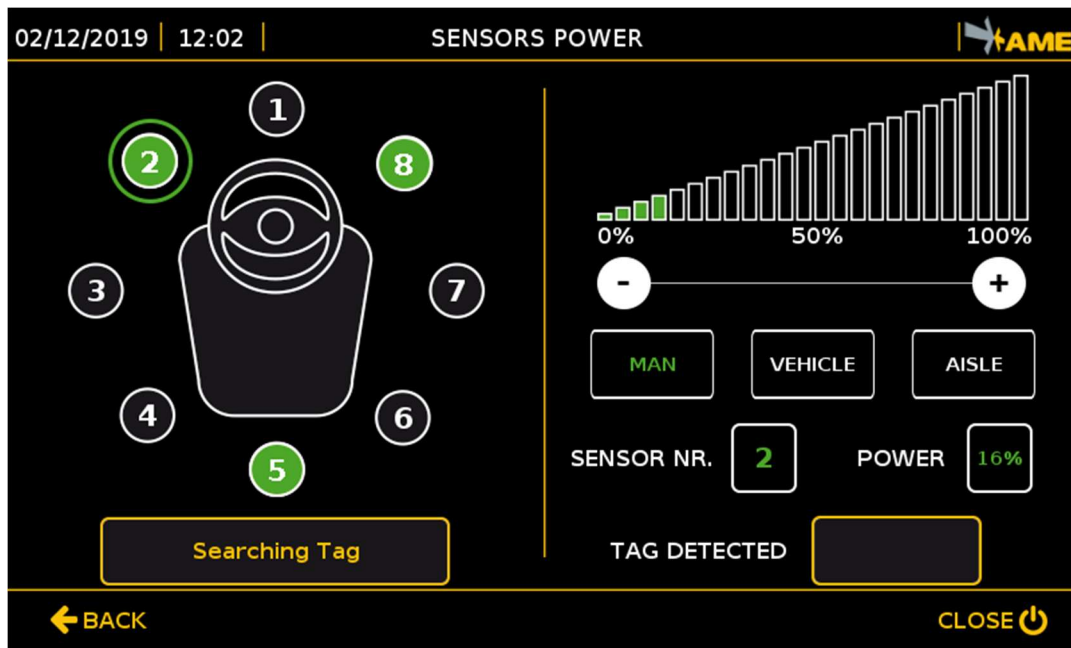


In this section, the sensor power can be changed as well as the detection distance of the worker's Tag and the AISLE mode. Firstly, press the 'MAN' key and carry out the operations in section 11.6.3 to set the sensor power compared to the operator's Tag.

Then, configure the sensor power when the vehicle is in a situation in which the AISLE mode is activated, that is, when the vehicle is in the aisle.

The value set must be between 0%÷100%, which will be added to or subtracted from the value of the set MAN power.

18.4 AISLE POWER SETTING | VEHICLE- VEHICLE



In this section, the sensor power can be changed as well as the detection distance of the worker's Tag if the vehicle is in the aisle and the AISLE module is activated. The detection distance of the rest of the vehicles can be set too.

Firstly, press the 'MAN' key and carry out the operations in section 11.6.3 to set the sensor power compared to the operator's Tag.

Then, press the 'VEHICLE' key and carry out the operations in section 13.3 to set the sensor power compared to the vehicles.

Finally, set the AISLE power, that is, when the vehicle is in the aisle.

The value set must be between 0%÷100%, which will be added to or subtracted from the values of the MAN power and the VEHICLE power that have been set.

19 WI-FI MODULE

With the WI-FI module, after a hardware module is installed, data can be automatically downloaded, directly to the server, and the system can be remotely controlled.

19.1 INSTALLATION

19.1.1 WI-FI ANTENNA

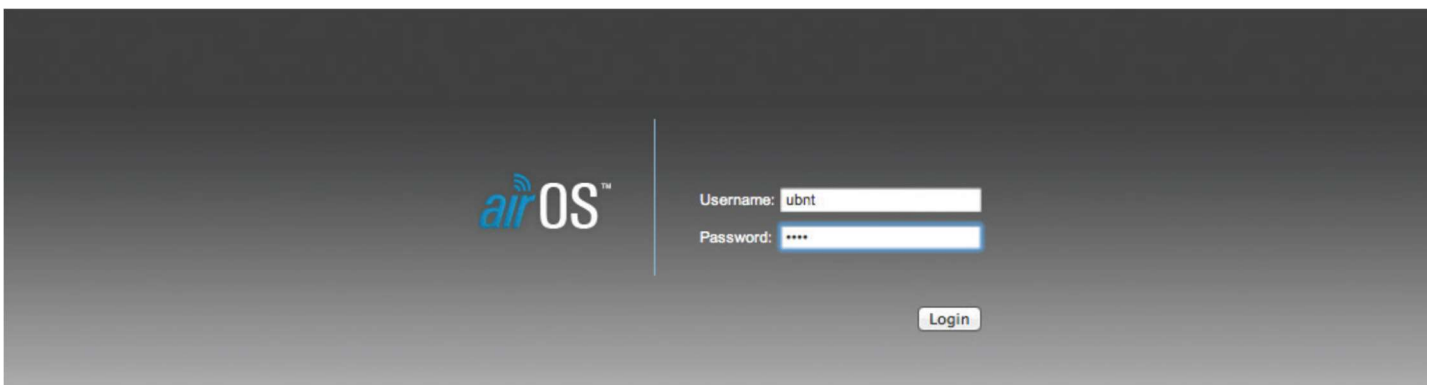
Ubiquiti BULLET M2-HP



The Wi-Fi module must be connected directly to the LAN port of the CPU. The default LAN features a POE, so no external power is required.

This module is used to connect the system to the Wi-Fi network. Depending on what is needed, the module can be configured as access point, client or bridge.

To configure the module, refer to the dedicated manual of the module. The configuration can be made directly by connecting a module to a PC (use a Ubiquiti POE-15-12W power adapter; not supplied), and access the configuration page via any browser by typing: <https://192.168.1.1>



Enter **ubnt** in the username and password fields.

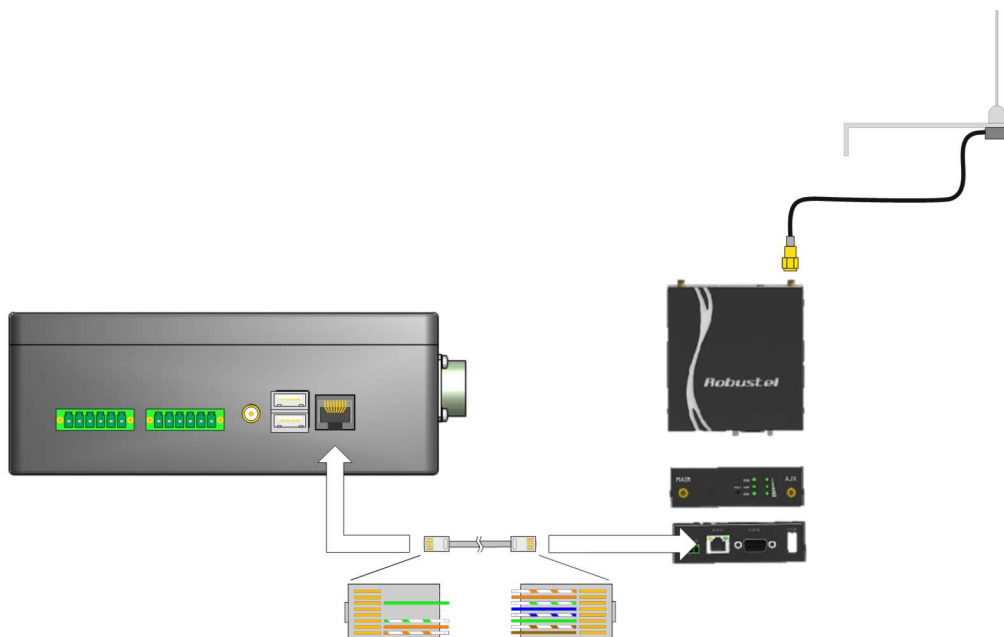
19.1.2 CELLULAR ROUTER

Robustel R3000-L4L

This module is a cellular router for internet connection via 3G or 4G network (depending on the SIM used).



The router is connected to the LAN port of the CPU with the dedicated cable supplied with the device that cuts off power to the POE. Afterwards, connect the device to the power supply of the system, and connect the external antenna to the MAIN connector.



Configure the router before it is installed in the system.

It can be configured by connecting the router directly to a PC using a LAN cable and powering it via an external 12V/24V, 2A power supply unit.

Then, access the configuration page via any browser by typing: <https://192.168.0.1>

Enter **admin** in the username and password fields.



The login page features the Robustel logo at the top. Below it, there are three input fields: 'Enter Username' with a person icon, 'Enter Password' with a lock icon, and a language dropdown menu currently set to 'English'. A green 'LOGIN' button is positioned at the bottom of the form.

The figure below shows the control panel where the status of the router is displayed.



The control panel displays the 'Status' page. A yellow warning banner at the top states: 'It is strongly recommended to change the default password.' The left sidebar contains navigation links: Status, Interface, Network, VPN, Services, and System. The main content area is divided into three sections:

- System Information:**
 - Device Model: R3000 Lite
 - System Uptime: 1 day, 04:52:34
 - System Time: Fri May 12 15:44:07 2017
 - RAM Usage: 80M Free/128M Total
 - Firmware Version: 3.0.0
 - Hardware Version: 1.3
 - Kernel Version: 4.1.0
 - Serial Number: 1425121212111
- Internet Status:**
 - Active Link: WWAN1
 - Uptime: 1 day, 04:51:49
 - IP Address: 10.71.252.175/255.255.255.224
 - Gateway: 10.71.252.161
 - DNS: 120.80.80.80 221.5.88.88
- LAN Status:** (partially visible)

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CHANGING USER NAME AND PASSWORD

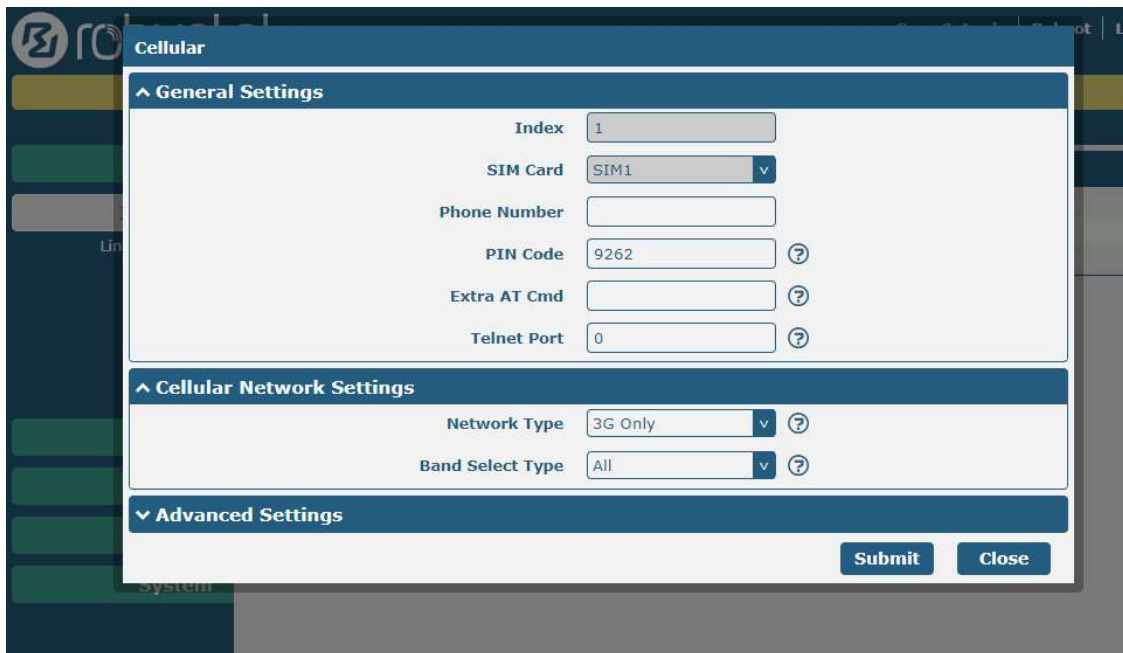


For security reasons, change both user name and password after the first login.

To change username and password, access the 'System> User Management' section from the control panel.

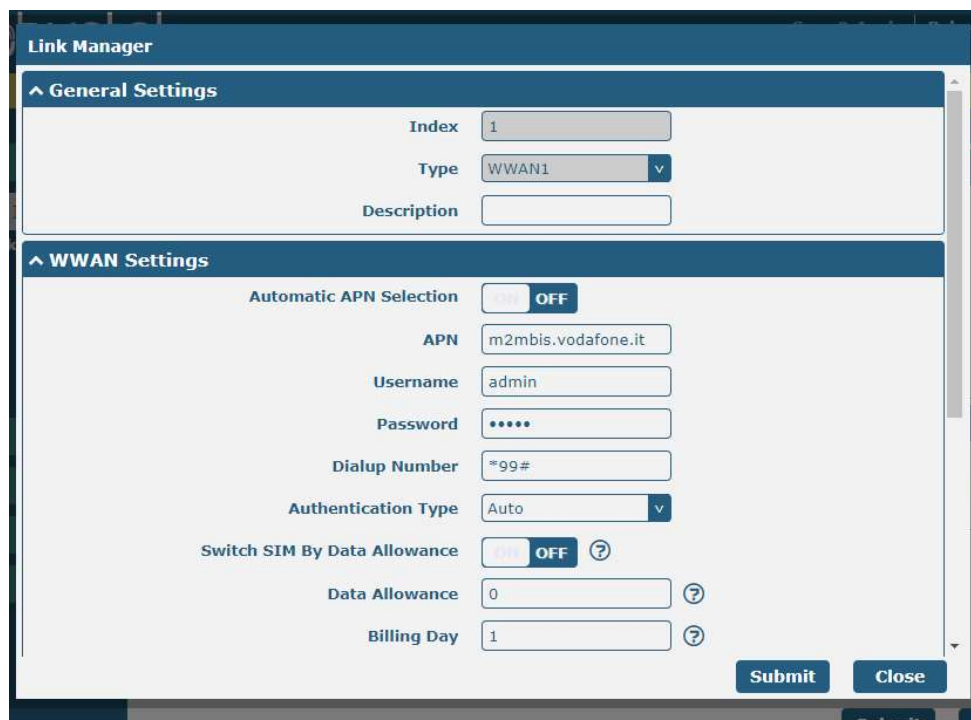
SIM PARAMETERS

Enter the SIM parameters in the 'Interface> Cellular' section so that the router connects to the internet.



The screenshot shows the 'Cellular' configuration window. It has three main sections: 'General Settings', 'Cellular Network Settings', and 'Advanced Settings' (which is currently collapsed). The 'General Settings' section includes fields for Index (1), SIM Card (SIM1), Phone Number, PIN Code (9262), Extra AT Cmd, and Telnet Port (0). The 'Cellular Network Settings' section includes Network Type (3G Only) and Band Select Type (All). The 'Advanced Settings' section is currently hidden. There are 'Submit' and 'Close' buttons at the bottom right.

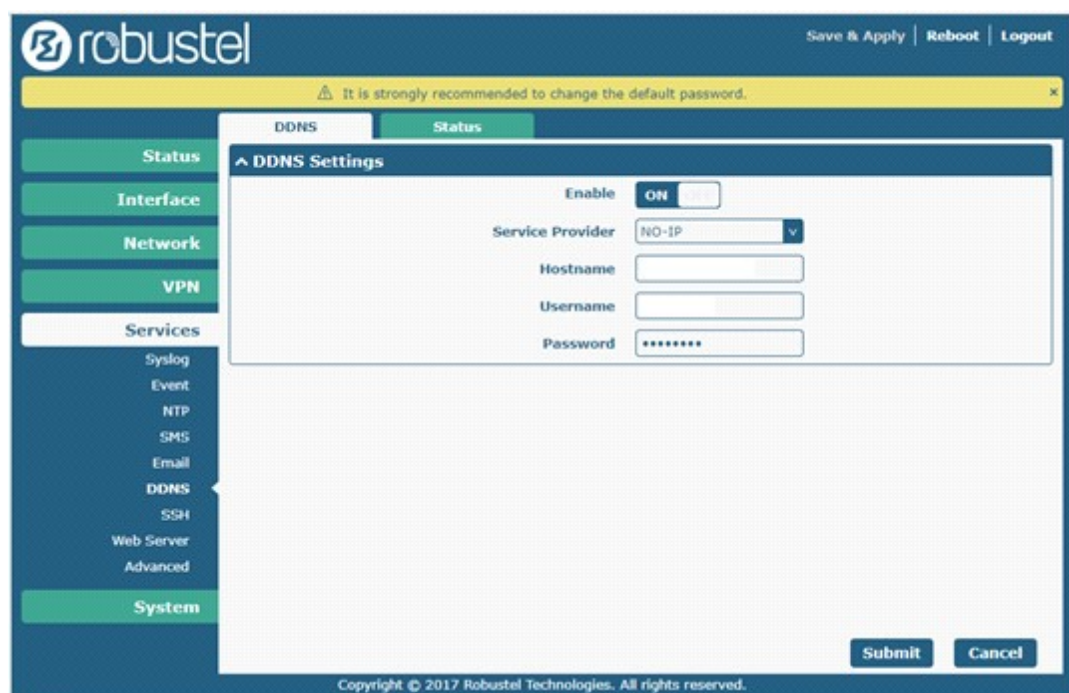
In the "Interface> Link Manager" section, enter the APN and Dialup parameters provided by the operator.



The screenshot shows the 'Link Manager' configuration window. It has two main sections: 'General Settings' and 'WWAN Settings'. The 'General Settings' section includes fields for Index (1), Type (WWAN1), and Description. The 'WWAN Settings' section includes a toggle for Automatic APN Selection (OFF), fields for APN (m2mbis.vodafone.it), Username (admin), Password (masked with dots), Dialup Number (*99#), Authentication Type (Auto), a toggle for Switch SIM By Data Allowance (OFF), and fields for Data Allowance (0) and Billing Day (1). There are 'Submit' and 'Close' buttons at the bottom right.

REMOTE CONNECTION

If the remote connection is to be enabled, first enable the DDNS service and configure the forwarding of ports 22 (ssh) and 5900 (vnc).



When forwarding ports, enter the IP address that will be assigned to the CPU in the 'Local IP' field. For the ssh port, it is safer to open an alternative port (e.g., 222) and forward to port 22.

After all the configurations are set, press 'Save & Apply' so that they become effective.

There are 3 LEDs in the router that indicate the status of the system:



LED	Status	Description
RUN	On, quick flashing (250 ms)	Router is on (system initialization)
	On, normal flashing (500 ms)	Router is starting the operations
	Off	Router is off
USR-NET	On, steady	Connected to the network and good signal
	On, flashing	Connected to the network but the connection is slow
	Off	Not connected to the network
PPP	On, steady	Link connected
	Off	Link not connected
	3 LEDs On	High signal available
	2 LEDs On	Medium signal available
	1 LEDs On	Low signal available
	Off	No signal

	When the network is disconnected, these three LEDs indicate the possible cause of the problem. Errors are encoded using a binary code; the order of the LEDs follows the figure. Flashing: 1 Off: 0 100 AT command failed 010 SIM card not detected 110 PIN code needed 001 PUK code needed 101 Registration failed 011 Module error 111 Not supported module
--	--

19.2 VISUALISATION



The icon of the Wi-Fi module is green: the system is sending data to the system; therefore, it is under the Wi-Fi coverage needed to send data to the server.



The icon of the Wi-Fi module is red: the system is not transferring data to the server. Check the configuration of the modules used for the connection. If the module is the cellular router, also check that the SIM and internet service provider settings match.

The configuration of the network parameters can be modified from the advanced menu of the system (contact technical support for help).

19.3 DATA TRANSFER



- Data are downloaded every time the vehicle gets within the WI-FI coverage.
- Data are downloaded to an FTP server as zip folders with daily data.
- If transmission is successful, the file is no longer resent.

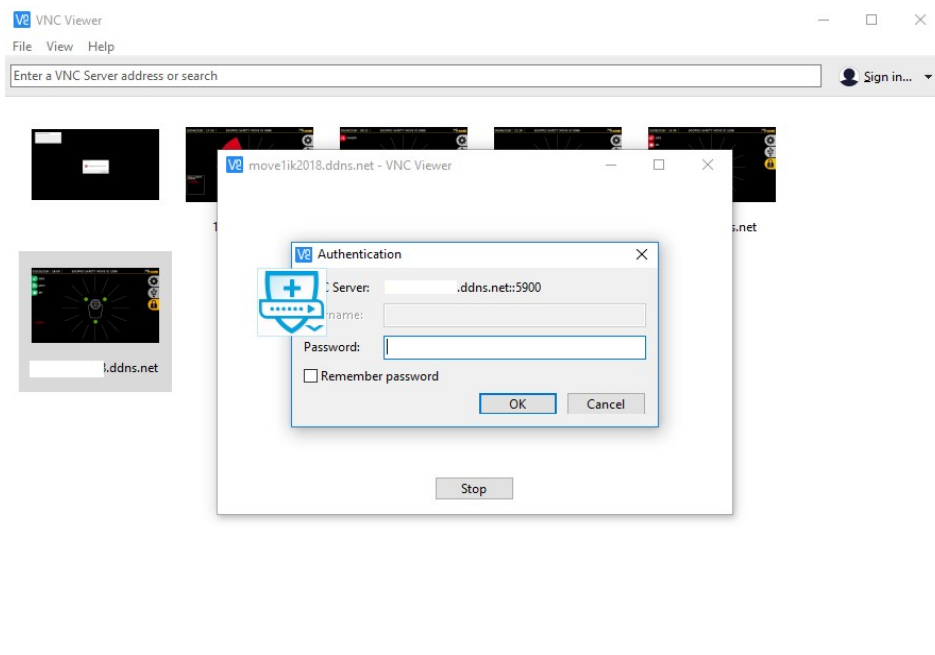
Downloaded data include:

- **TAG detected events** with the following information: Detected TAG code – Activated sensor – date and time – GPS coordinates (if the option is installed).
- **Configurations carried out**: type of configuration and saved data.
- **Shocks** (if enabled) with the following information: date and time - GPS coordinates (if the option is installed) - shock intensity.
- **Checklist** (if activated) with the following information: answers to the questions.

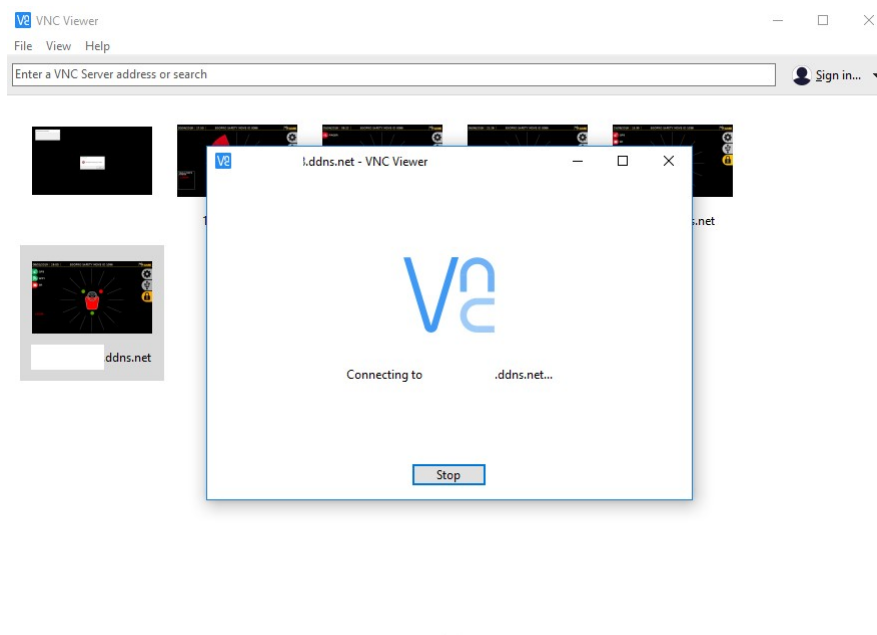
The events will be analyzed via the EGOpro Manager software.

19.4 REMOTE CONTROL

The system can be remotely controlled with any VNC client installed on a computer or with a mobile app.



Enter the password: **move2018**.



Accept the connection even if not encrypted. Now, the control is enabled.

20 CHECKLIST MODULE

The pre-operational check helps the person in charge of the fleet of forklift trucks to:

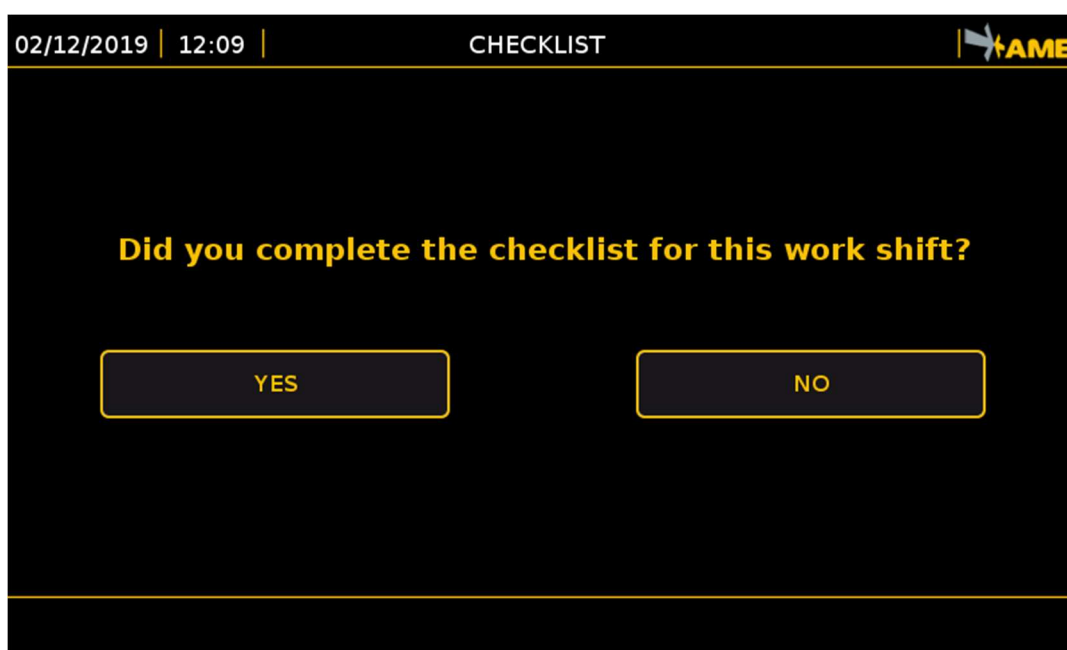
- Ensure that the fleet is available and safe for use when a driver gets into the vehicle.
- Meet the legal requirements on safety.

Each time the checklist is completed, the result is saved to the system.

This checklist can also be connected to the vehicle's ignition, so that the driver cannot use the vehicle if the questions are not answered.

The relay parameters can be configured in a manner that starting the vehicle is subject to completing the checklist from the advanced menu of the system (contact technical support for help).

20.1 VISUALISATION

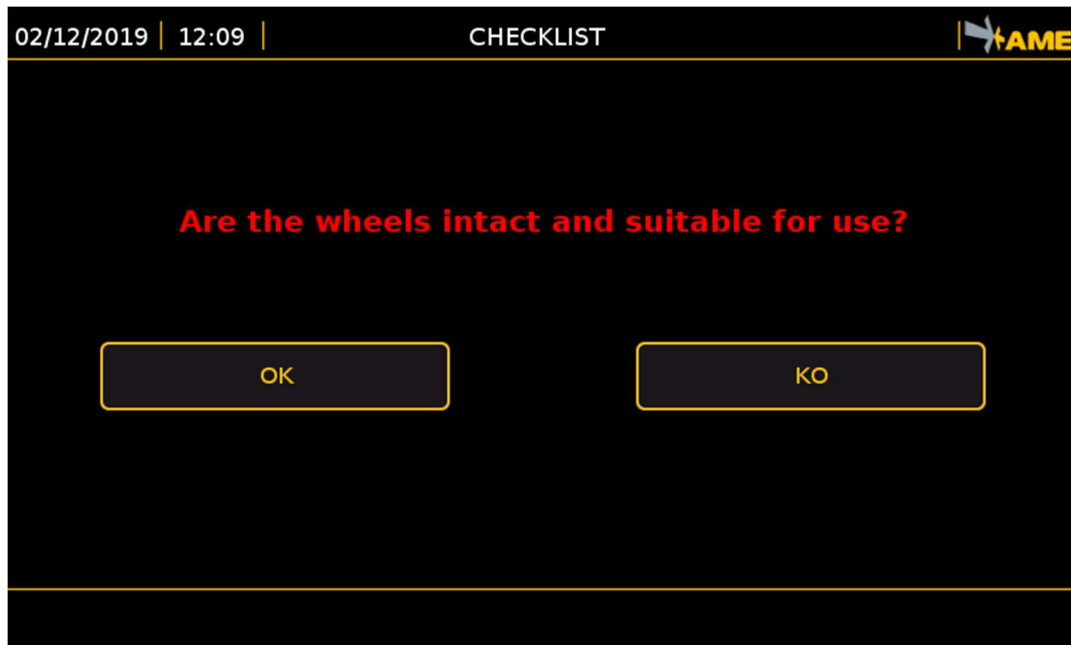


02/12/2019 | 12:09 | CHECKLIST | AME

Did you complete the checklist for this work shift?

YES NO

The first question the system asks is whether this procedure has already been completed for your work shift. If the answer is 'Yes', the subsequent questions are skipped and the main screen is directly displayed. This is also recorded in the system.

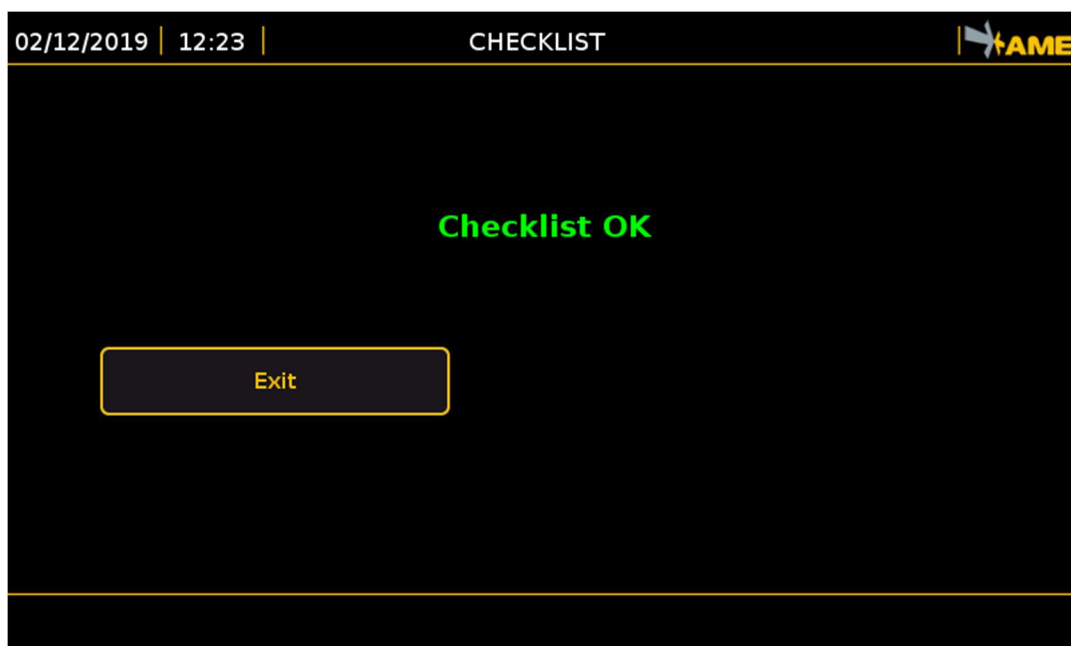


Before starting up, the system shows the driver some yes/no questions, which he must answer.

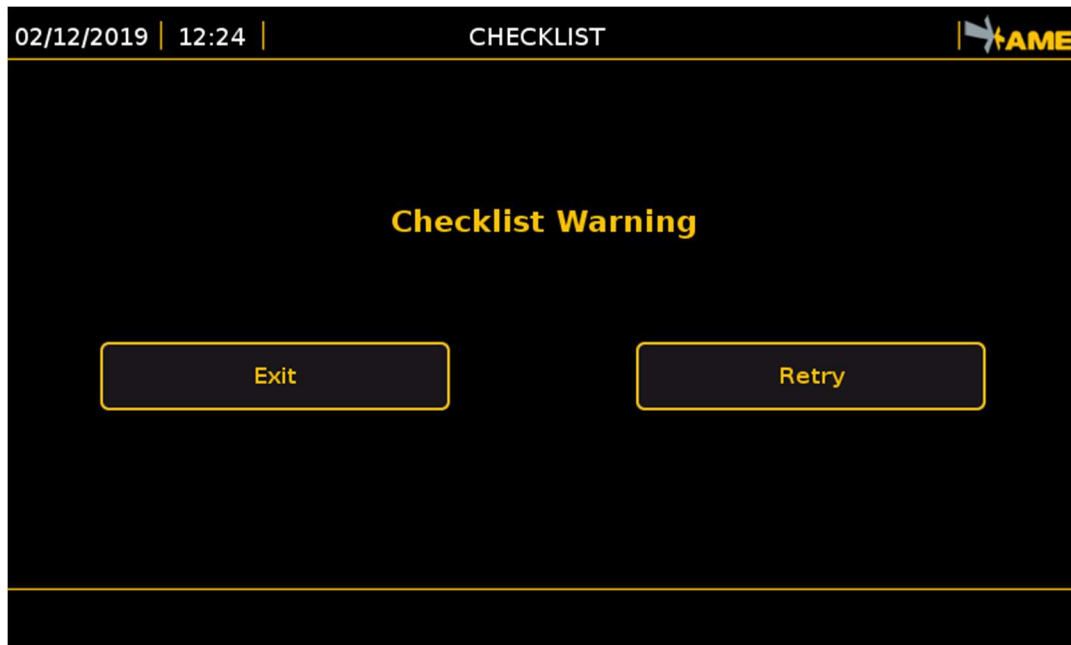
Once the set of questions (decided together with the customer) is answered, the driver is operative and ready to start working.

The result of the test may be different depending on the answers.

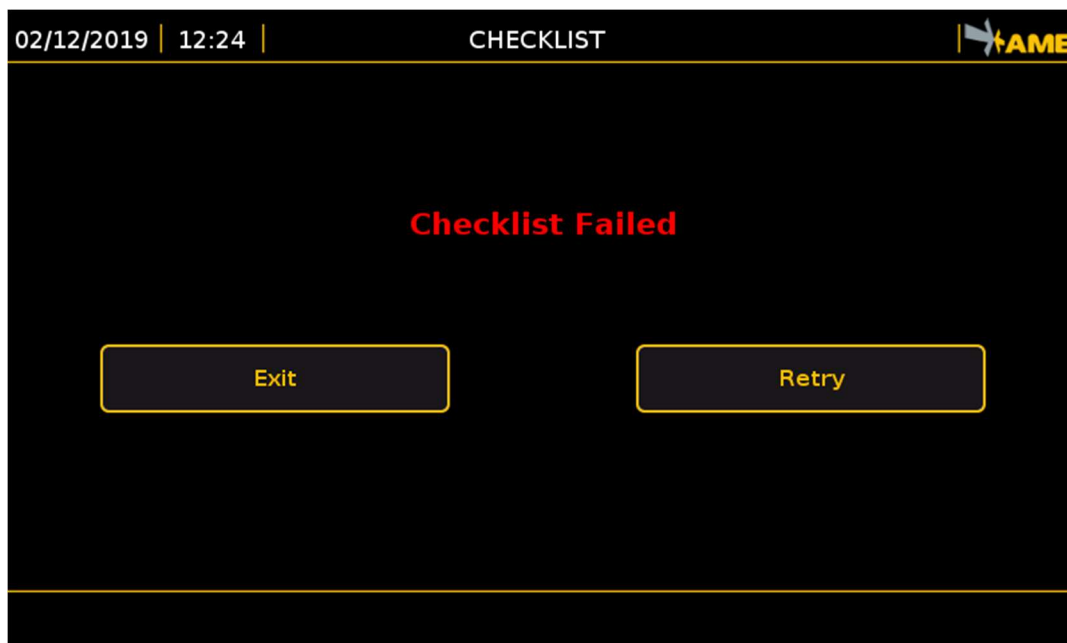
CHECKLIST OK: all the checks are correct; press 'exit' to go back to the main screen.



CHECKLIST WARNING: only the checks are correct; some warnings are in alarm. Press 'exit' to go back to the main screen and press 'retry' to repeat the test.



CHECKLIST FAILED: at least one important check is not correct. Press 'exit' to go back to the main screen and press 'retry' to repeat the test. In this case, if predetermined by the configuration, the vehicle does not start.



20.2 TEST RESULT

Each time the test is run, the system saves the results of the tests on board for 60 days.

To retrieve the results saved, simply download the data using a USB memory (see section 10.6).

If the Checklist function is enabled, the system will create a special directory in the memory with the serial number of the system (CPU ID): e.g., if the ID is 950, the directory will be named 'Checklist_0950'. There are the cvs daily files in the directory containing the result of the test.

BADGE	TAG	DATE	SKIPPED	RESULT	Question_0	Question_1	Question_2	Question_3
72003E6CB0	39538	25/11/2018 09:30	0	OK	1	2	1	1
XXXXXX	XXXXX	25/11/2018 11:50	1	OK	1	2	1	1
72003E6CB0	39538	25/11/2018 14:30	0	ERROR	1	2	-2	1

- **BADGE:** badge of the user that has logged in. If the Badge module is not active, the field is XXXXXX
- **TAG:** Tag of the user that has logged in. If the Badge module is not active, the field is XXXXXX
- **DATE:** date and time when the test was conducted
- **SKIPPED:** if = 1, the driver answered 'yes' to the first question; if so, the subsequent answers are automatically saved as correct.
- **RESULT:** shows the result of the test.
- **Question_0...Question_n:** shows the answers entered by the operator (1 or 2). If negative, the answer is incorrect.

If the Wi-Fi module is active, the checklist files will be automatically sent to the server (see chapter 19).

20.3 CONFIGURATION

The list of questions can be customised and the customer can agree on both the list of questions and the answers.

All questions are editable, except for the first one: 'Did you complete the checklist for this work shift?'



The first list of questions is made and entered into the system together with the technicians.

For the remaining questions, modify the 'checklist_config.dat' file delivered at the time of the first installation. To edit the file, use a text editor like Notepad ++.

The file consists of 2 parts:

CONFIGURATION:

```
[config]
n_question=4
n_max_error=0
result_message_ok= Test ok
result_message_failed= Test Failed
result_message_warning= Test Warning
relay=0
```

where:

- n_question: number of questions to display.
- n_max_error: maximum number of errors to regard the test as passed.
- result_message_ok: message that is displayed when the test is passed.
- result_message_failed: message that is displayed when the test is failed.
- result_message_warning: message that is displayed when the (non-blocking) warning responses are incorrect.
- relay: relay management. If = 0 the relay is closed at the end of the test regardless of the result. If = 1 the relay is closed only if the test has been passed.

NOTE: this is the relay present in the CPU and it can take different statuses if used in combination with other modules (see Badge module).

QUESTIONS:

```
[question_0]
msg= Is there any evident damage to the vehicle?
n_options=2
o_1=YES
o_2=NO
response_ok=1
type=0
```

where:

- msg: text of the question.
- n_options: number of answers to display. This parameter can take 2, 3 or 4 as values.
- o_1, o_2...: text of the keys (from 1 to 4).
- response: defines which answer is correct.
- type: if = 1 the answer is non-blocking (warning).

The text of the questions can be formatted according to the rules of the html language; in this case all the texts must be enclosed in <html> </html> tags.

If necessary, the html text is subdivided automatically in several lines.

Find below some formatting examples.

To centre the text:

```
<html><center> Text centred </center></html>
```

To colour the text (the text is yellow by default):

```
<html><center><font color="red">Text coloured in red</font></center></html>
```

To increase the size of the text:

```
<html><center><font size="6">ext with a different size</font></center></html>
```

20.3.1 UPLOADING SETTINGS

To upload the set of questions prepared for the SW module, follow the steps below:

- Copy the necessary files to the root directory of a USB memory.
 - The checklist_config.dat file copied to a directory named Checklist
 - The update.sh file (provided by A.M.E. srl)
- Insert the memory into the USB port of the CPU and restart the system.
- After the restart, remove the USB from the system.

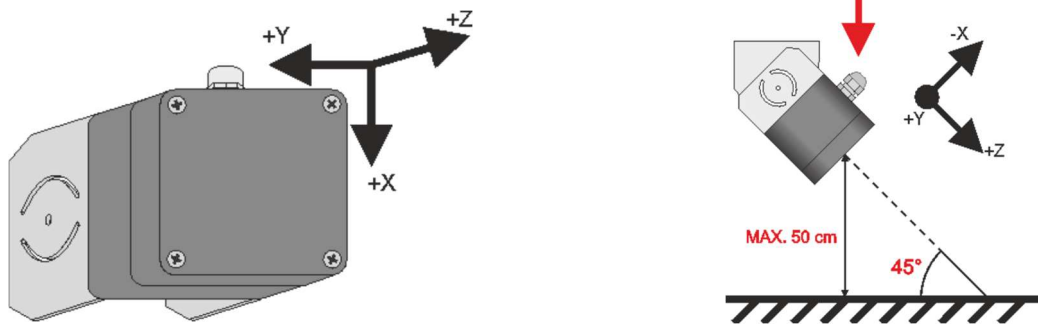
21 INDOOR SPEED MODULE

P LX SENAD

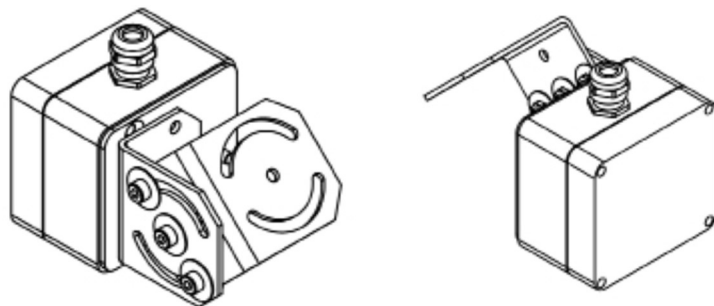


21.1 INSTALLATION

The indoor speed module includes the speed sensor that must be fitted correctly on the vehicle.
The speed sensor must be fitted at a 45° angle from the ground, between 30 and 50 cm above the ground.
The sense of assembly must take into account the position of the cable gland, as shown in the drawing.



In order to fit the indoor speed sensor, a metal joint that must be used to fasten the sensor to the vehicle is supplied.



Create an anchoring clamp (not supplied) on the vehicle, onto which the joint can be fixed with 3 in-line holes, Ø4mm, 17.5 mm apart.

Fix one part of the joint to the sensor, and the other to the anchoring clamp. Connect both parts of the joint with the nuts supplied.

The indoor speed sensor is supplied with a 5-m UTP cable which must end with an RJ45 connector (see section 8.3.1) and must be connected either directly to a sensor port of the CPU or to a splitter.

21.2 INDOOR SPEED VISUALISATION



By means of this device, the system can detect the speed that will serve to enable the ADAPTIVITY function.

It also allows acquiring the direction in which the vehicle moves, which can be used to adapt the power of the sensors according to the direction. For example, when the vehicle is moving in reverse, the power of the front sensors could be reduced to a minimum.



The icon of the SPEED module is green: the system is receiving data from the sensor.

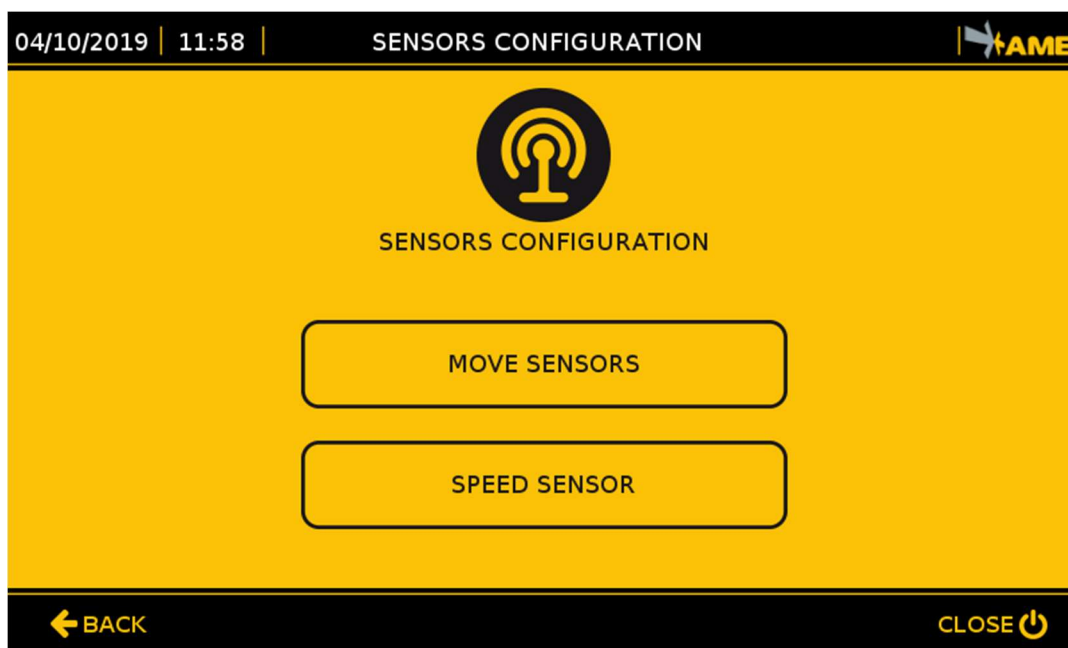


If the icon of the SPEED module is red: the system is not receiving data (e.g., if there is a communication error or a problem in the sensor itself).



- With the speed sensor, the speed signal is also received indoors since an external signal is not necessary for operation.
- The speed sensor does not supply data about the vehicle position, it only supplies data about the speed and the moving direction.
- Both the indoor speed sensor and the GPS can be fitted.

21.3 CONFIGURATION

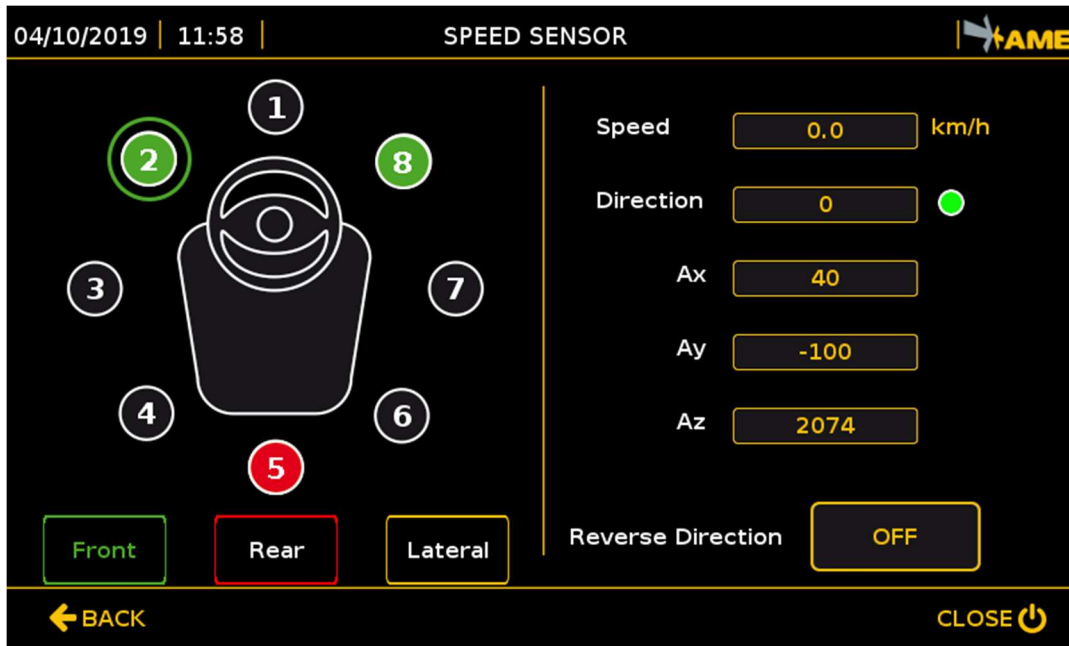


To adjust the speed sensor, configure the settings in the 'SENSORS SEARCH' sub-menu in the 'SENSORS CONFIGURATION' menu.

These are the options in the 'Sensor search' submenu:

- **MOVE SENSORS:** It defines active sensors.
- **SPEED SENSOR:** It configures the speed sensor.

Press the '**SPEED SENSOR**' key and access the configuration menu.



To configure the speed sensor, follow these steps:

1. **SENSOR POSITION:** Check that the position of the sensor is correct by means of the values on the right side of the display. The values must be between the following ranges:

Ax negative value between -1510 and -1390

Ay value tending to zero between -60 +60

Az positive value between 1510 and 1390

If the values are not between the ranges defined, review the installation of the sensor and check that the inclination angle of the sensor is at 45° compared to the ground.

2. **SENSORS CONFIGURATION:** Set the direction of the vehicle so that, if the vehicle is driven forward, front sensors increase their detection range and rear sensors are reduced at minimum, and vice versa in reverse gear. The lateral sensors do not change the power when the direction of motion is changed.

Select the sensor to be configured and set if it is:

Forward: front sensors (green)

Rear: rear sensors (red)

Lateral: lateral sensors (yellow, if any)

3. **DIRECTION OF THE VEHICLE:** check that:

- if the vehicle is driven forward, the value indicated in the direction box is > or = to 0 and that the circle is green.
- if the vehicle is driven backward, the value indicated in the direction box is < or = to 0 and that the circle is red.
- If signals are inverted, press the REVERSE DIRECTION key.



If the first SPEED box shows -0.1, the sensor has operation problems or it is not active.