WEB SERVICE
FOR RFID TECHNOLOGY

Summary

WEB SERVICE FOR RFID TECHNOLOGY

1. INTRODUCTION

Gimatic provides a solution to keep trace of RFID data. Thanks to this service it is possible to check how and where all the devices are working by connecting to an account. In any moment the customer can keep under control his production by accessing the Gimatic Web Service platform using a generic device with a browser.

The RFID technology (Radio Frequency IDentification) is a system for the automatic recognition of gripping tools composed of a RFID reader (RAQC) and a memory tag (RBQC), that can hold several information like:

- MAIN DATA (i.e. tool name and description, tool ID number, tool mass and overall dimensions, etc);
- MASS PROPERTIES (i.e. tool principal moments of inertia, tool centre of gravity coordinates, etc);
- GEOMETRIC PROPERTIES (i.e. geometric calibration parameters);
- PARTS LIST (i.e. up to 40 entries as parts list with editable description, quantity and edition).

Every tag is identified by an UID number that is univocal for each tag. All these data can be checked and read from Gimatic Web Service platform, an exclusive cloud for the client that can collect data by each production site worldwide. The image below shows, in board terms, the data path from the memory tag to the user devices. When a memory tag is read by the Gimatic's mobile application, a data packet is automatically sent to the cloud and then it is possible to access all the detailed information.

Figure 1

2. GIMATIC MOBILE APPLICATION

In the following lines the instructions for using Gimatic mobile application will be showed. The application is useful to perform data exchange with NFC tags and to write data into them. **A smartphone with Android system and NFC reader is required**. It's possible to download the Gimatic application from Play Store or using the QR code below.

Figure 2

2.1 Log In

The user can log in into the application using specific user name, password and accepting the privacy policy, *(Figure 3).* The log in is necessary only for writing information into the tag, not for reading information. The costumer must ask reference subsidiary for password and username. Take care that there is only one username and one password, with these credentials everyone can modify the tag parameters, using Gimatic application and memory tag (RBQC).
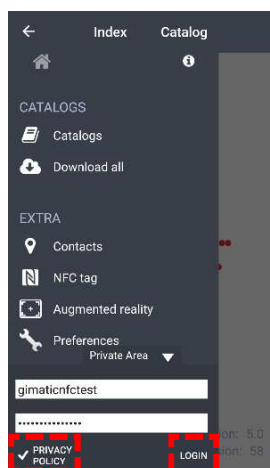

Figure 3

2.2 Reading and Writing

The procedures to read and write the tag are described below:

- Activate the NFC functionality on the smartphone and click on *'NFC tag'* (*Figure 4).*

- Place RBQC on the back of the smartphone (where NFC reader is placed) and move RBQC slowly until will appears '*TAG reading successful' (Figure 5).* Then *'MAIN DATA'* can be analyzed*.* In the upper right part of the screen there is an icon the three points ⋮ and by clicking on it the *'Enable expert mode'* text will appear. By checking this option, the full list of data and parameters becomes visible and editable. Please note that the *'Enable expert mode'* option is not accessible without a correct log in and in this case the reading of the *'MAIN DATA'* section in the only possible operation*.*

- Once the expert mode has been enabled, all the parameters can be overwritten by clicking on the pen icon (example: the EOAT ID number is editable), as shown in *Figure 6*. To confirm the change and to write the new parameters into the tag, the *'APPLY'* button must be pressed*, in the upper right part of the screen *(Figure 7)*, holding the TAG in the position of reading action. When the update is completed, the application returns to the main screen. To be sure that the operation was performed successfully, please read again the same RBQC to check the new values of the parameters.

- Every time a tag is read by the application, if the smartphone is connected to the Internet, a data packet is sent automatically to the Gimatic Cloud. It is also possible to send an extra packet manually, clicking on the wrench icon, *Figure 8,* and then on the red button in the lower right part of the screen, *Figure 9.* With this function, the user can send to the could some text messages to a communicate maintenance action among a predefined set, the possible choices are: preventive maintenance, component breakdown, component wear, regulation/calibration and configuration. In addition, it is possible to write some notes. This information can be sent also if the expert mode is disabled.
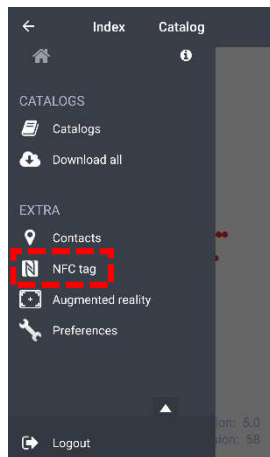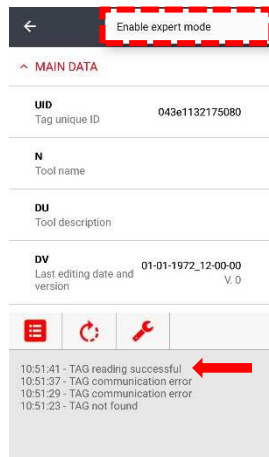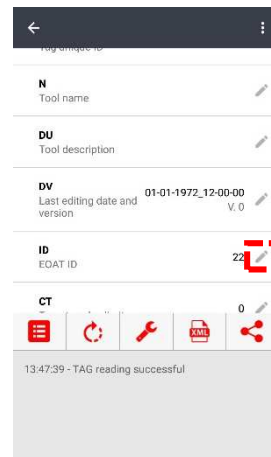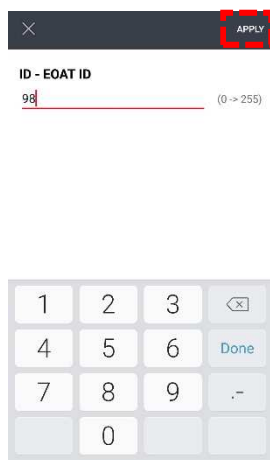

Figure 4

Figure 5

Figure 6

Figure 7
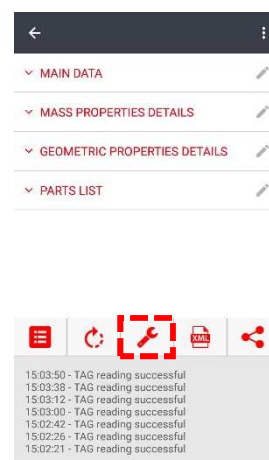
Figure 8
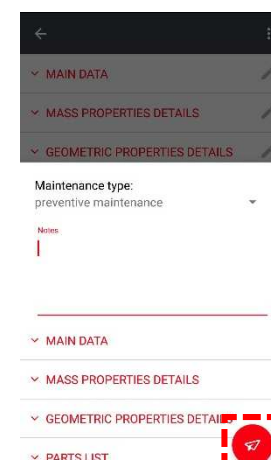
Figure 9

The icons present between the drop-down menu and the display for the messages indicate:

possibility to close the message display;
force the reading action;
send messages manually;
export a .xml file, where there is all the information regarding the tag (in particular the UID tag number).

3. WEB SERVICE

The server is structured in order to make possible a vertical visualization, so who is on the top can see whoever is at a lower level. There is also the possibility, with a customization of the software, that the customers handle directly their own data without sharing them with Gimatic cloud.

Figure 10

As it showed in the figure above, the platform is structured in such a way that it could be have five different profiles:

- Subsidiary/Dealers
- Direct Customer
- Customer
- Integrator
- Contractor

Customer and Direct Customer have the same privileges, the only difference is that Customer must be linked with a Subsidiary or with a Dealer.

3.1 How to Create an Account

The Gimatic Web Service can be reached through Gimatic Website or using the link: https://webservice.gimatic.com. In any case, a page will appear, as showed below *(Figure 11)*, where log in or new registration is requested. Clicking on *Register*, a new tab becomes visible *(Figure 12)* and it allows to fill the details to proceed with registration. After that an email will be sent to the address indicated and must be clicked on *Activate Account* to complete the registration.
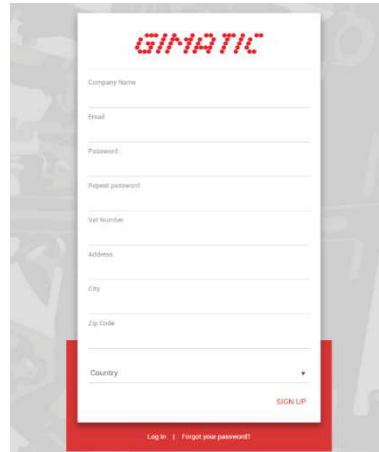
Figure 11

Figure 12

3.2   Web Service Main Page

Once logged in, the main page will appear *(Figure 13)*. It can be divided in three main areas:

- A: the map shows where the tags added by the COSTUMER A are localized. Clicking on the pen ✎ , near the customer name, it will open up the window showed in *Figure 14*, and there is the possibility to add integrators or contractors, as showed in the chapter 3.3. If the basket 🗑 is clicked on, the customer profile will be deleted. In the upper right of this section, there is the possibility to export the .xls file with all the information related to CUSTOMER A.
- B: the filters allow to find the desired tag assigned to CUSTOMER A.
- C: the tag list sets out all the tags, with some fast information like: UID, ID tag, last read, numbers of cycle and location. In the upper right there is the button that make it possible to assign a new tag, this procedure is described in the chapter 3.4.

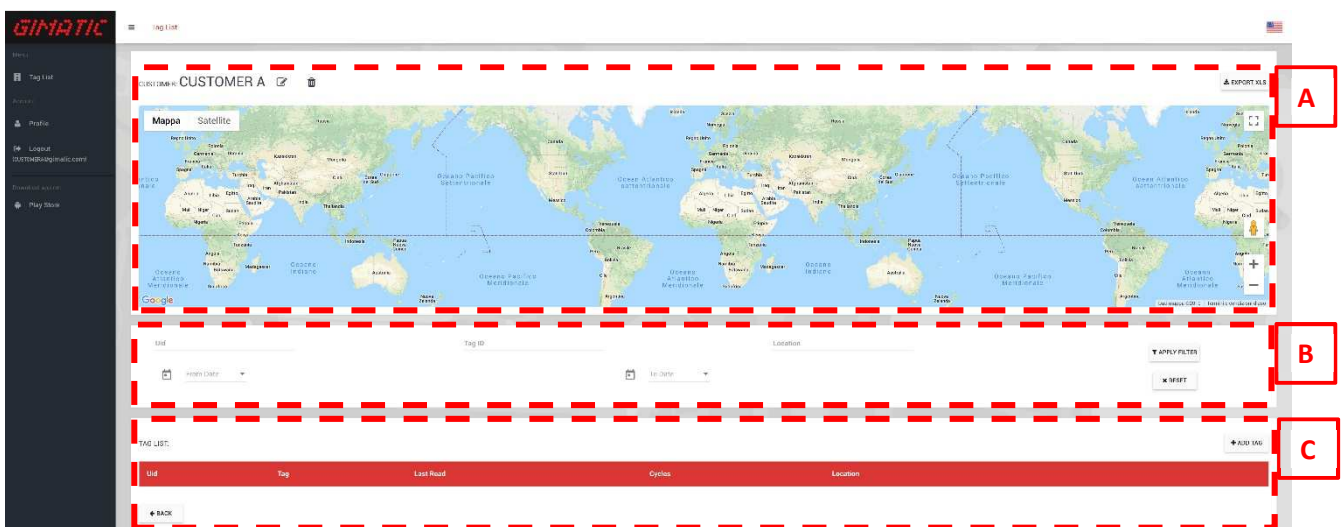(The examples are done using the costumer company name: CUSTOMER A)

Figure 13

3.3   How to Add Contractors and Integrators to the Customer List

To enter a contractor or an integrator, as said before, shall be clicked on the pen near the customer name, the picture below *(Figure 14)* shows the window that will appear. In the section A there are details concerning the CUSTOMER A. The section B underline the list of contractors and integrators already added and there is the option to assign a contractor or an integrator to CUSTOMER A. Trying to add a contractor, a chart like *Figure 15* will be displayed and to complete the operation has to enter the contractor name and email. The contractor can't see the tag details assigned to himself, for these reasons it doesn't need and account. An integrator can check all the details of his tags. Therefore, the customer must enter email and password during the insertion of an integrator, like in *Figure 16*. The same credentials will be used by the integrator to perform the log in. Then the integrator will receive an email containing a link for the activation of the account (later on the integrator can eventually change his username and password).
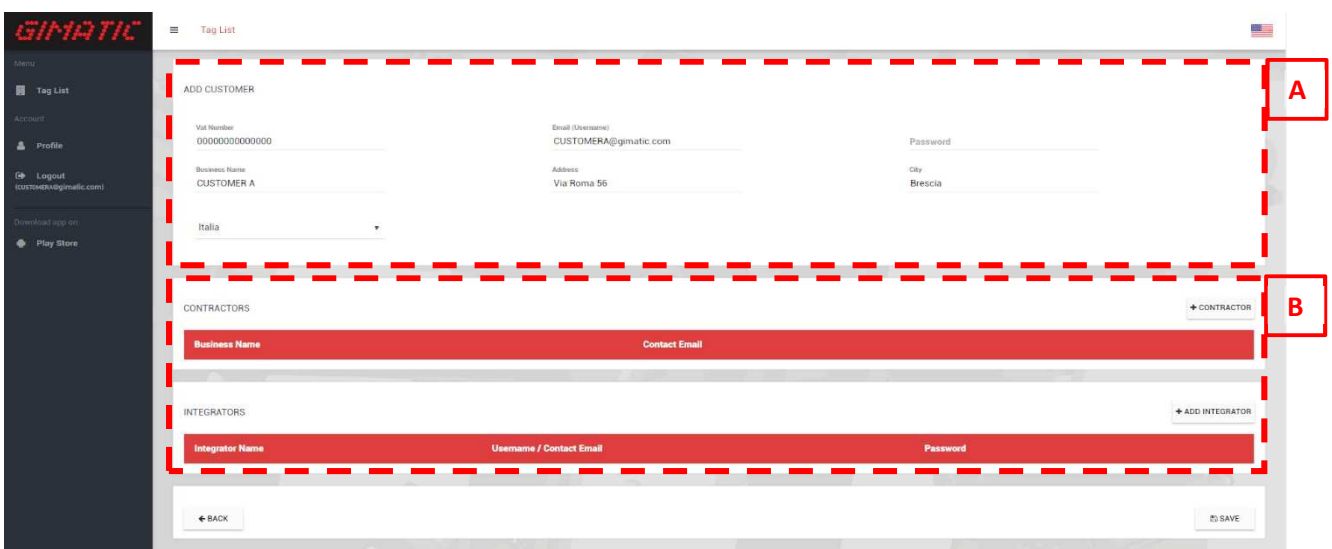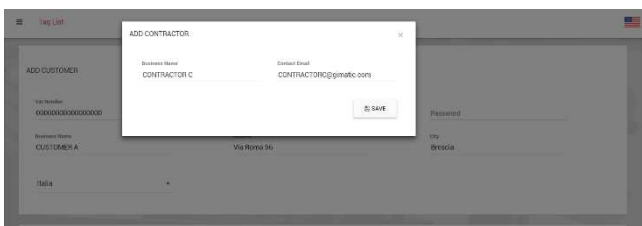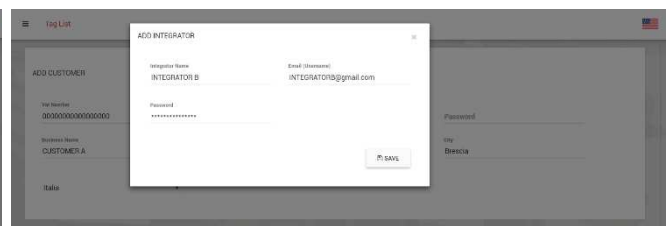

Figure 14

Figure 15

Figure 16

Once contractors or integrators have been added to the customer list, the customer's main page will look like *Figure 17*. In the contractors and integrators lists there is the option to delete the user account or to change his name or email, using the basket or the pen icon accordingly.
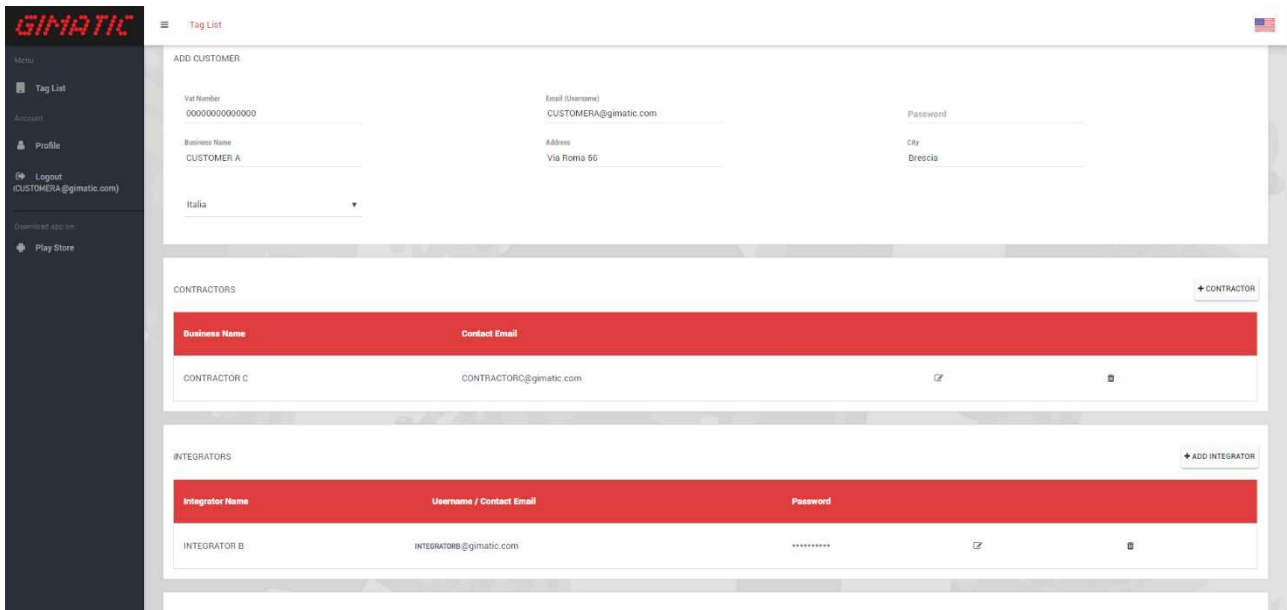
Figure 17

3.4 How to Assign a Tag to Contractors or Integrators

The next necessary step to configure the Web Service is to add a tag memory and to assign it to a user. As highlighted in *Figure 13*, at the end of the page there is the function ＋ADD TAG , it makes possible to assign the tag to a user (contractor or integrator). To complete the process, the UID tag number and the account name should be entered. The account can be introduced only if before it was created in the customer list. The UID tag number could be known looking into the .xml file, that could be exported from the mobile application (see chapter 2.2). The .xlm file is available only after the reading with mobile application. The UID number is a hexadecimal number composed by 14 digits.

Trying to assign a tag, it could occur two different errors. The first one *(Figure 18)* occurs if the tag has never been read by the mobile application, instead, the second one appears when the UID number entered has a different length from 14 digits *(Figure 19)*.
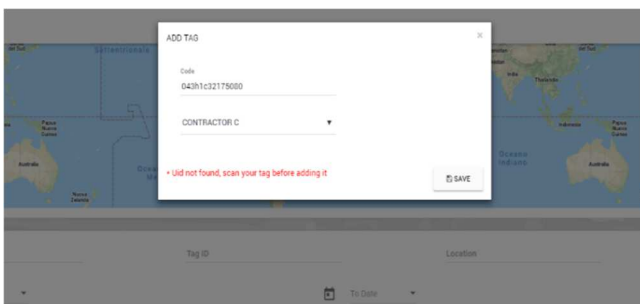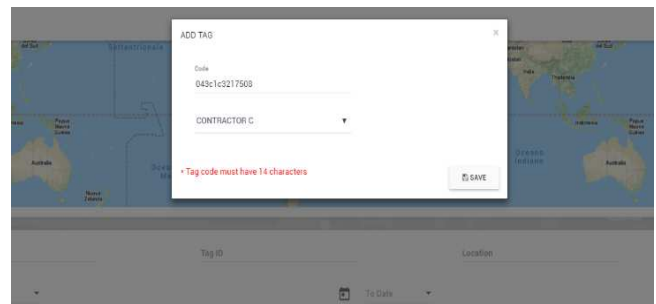

Figure 18

Figure 19

3.5 Tag Details

Coming back to the home page *(Figure 20)*, now, it shows the tag list with the information regarding the last reading and the tag geolocation is visible on the map. The information that can be seen in the tag list is:
- UID tag number;
- Tag: it represents the tag ID number. It may vary from 0 to 255 and it can be changed from mobile application (see chapter 2.2) or PC software;
- Last Read: it shows when was done the last reading;
- Cycles: number of EOAT cycles, they can be increased automatically;
- Location: last position from whom the tag is read. If the location is not indicated it means that the GPS mobile phone position wasn't active during the reading action therefore, the system can't recognize where the reading has been made.

Furthermore, there are three additional functions that are:
- DETAILS: clicking on it, it will appear another window as can be seen in *Figure 21*;
- ⬇ Export XLS: it permits to see all the details in a .xls file;
- ⇄ Unpair Tag: it gives the opportunity to unpair the tag from the user or to reassign the tag directly to another user.
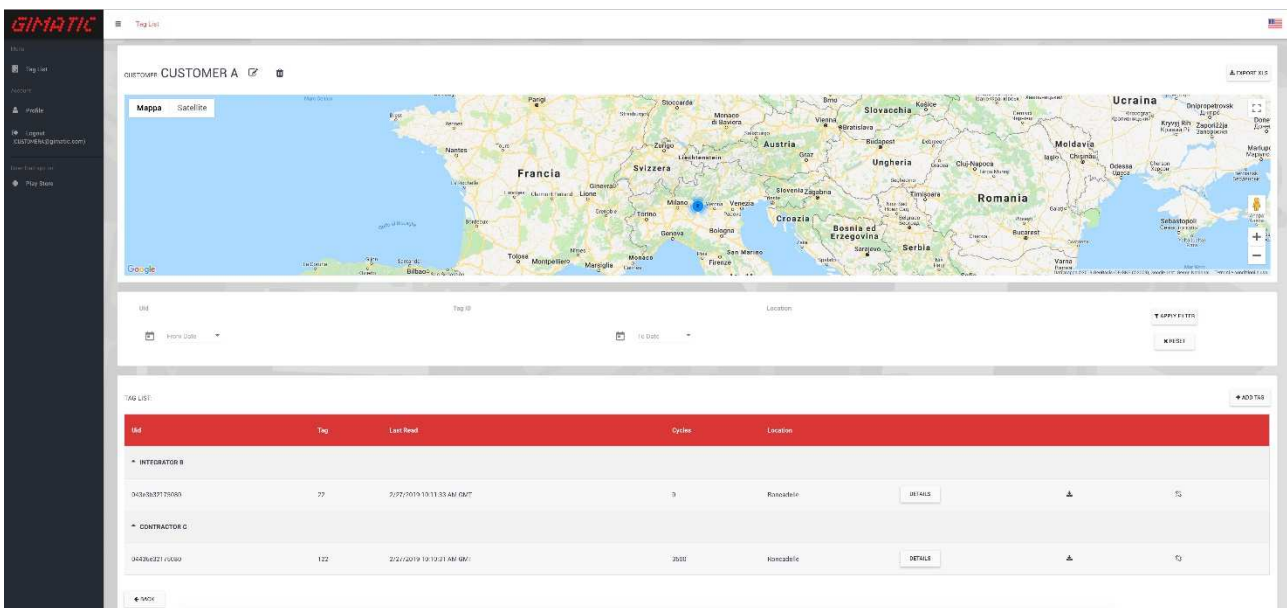

Figure 20

Opening the page concerning tag details, all the information about a specific tag is available, like geolocation, fast information, chart with cycles progress, bill of material and all the readings done *(Figure 21)*.
- A: tag geolocation;
- B: fast information regarding the last read;
- C: cycle progress, this chart shows the number of cycles performed by the EOAT connected to the RBQC. The graph is updated at every reading action. If a normal reading is carried out, a red point will be present on the chart. If there is a black point it means that was sent a maintenance action message;
- D: bill of material and last reading;

- **E**: reading history, it contains the literature regarding all the readings performed and they are listed showing date, operation, cycles and notes. In operation column there is the possibility to know what kind of action was done during the maintenance and if there is an attached note. In this case it is showed in *Notes* section with the mark icon ▪ and it can be read by clicking on *DETAILS*.

The permits for an integrator account are different from those of a customer. Indeed, the integrator can only see the tag's data assigned to him, in the same way explained before. The possibility to add some profile under an integrator is not provided.
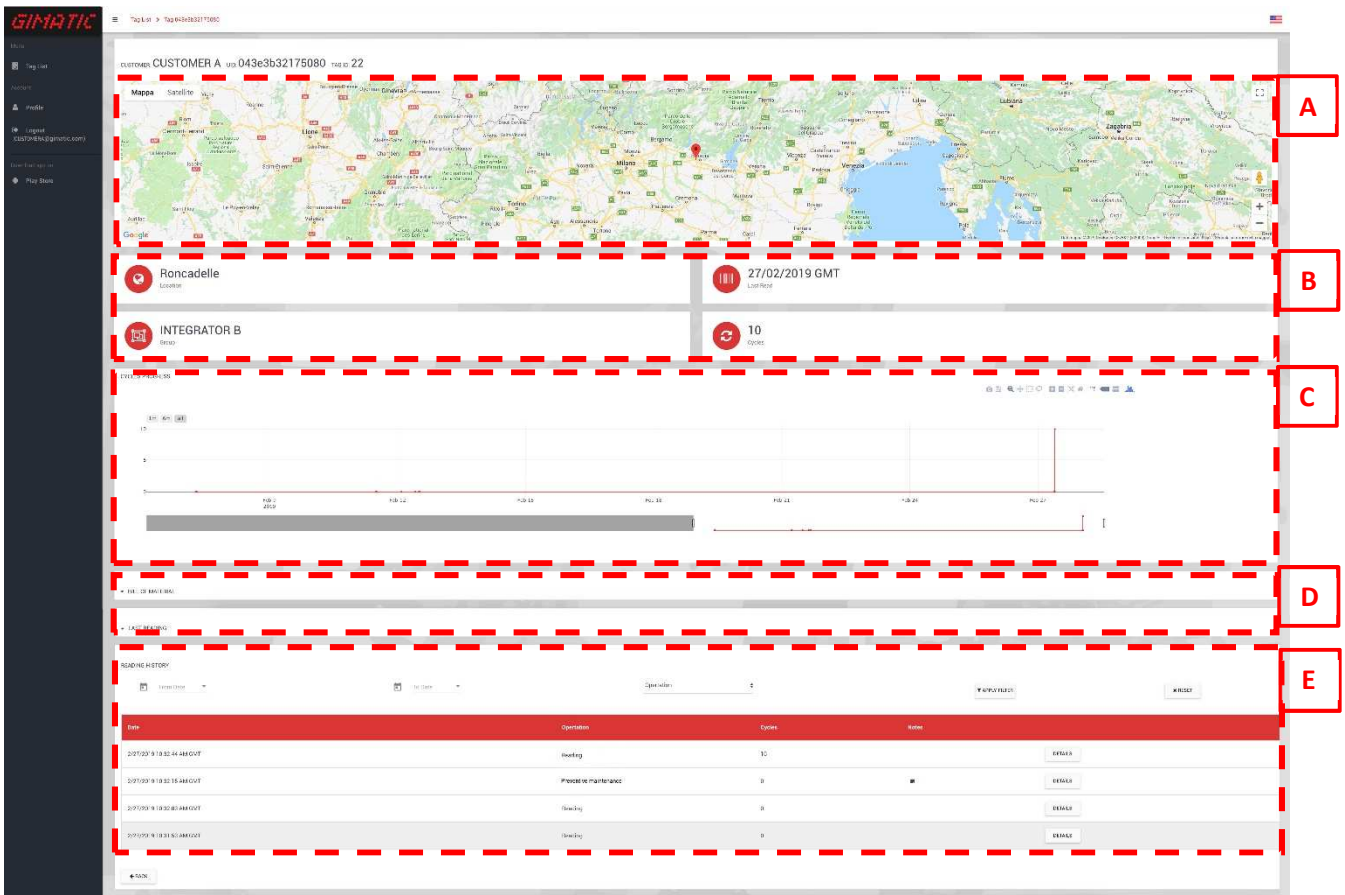

Figure 21