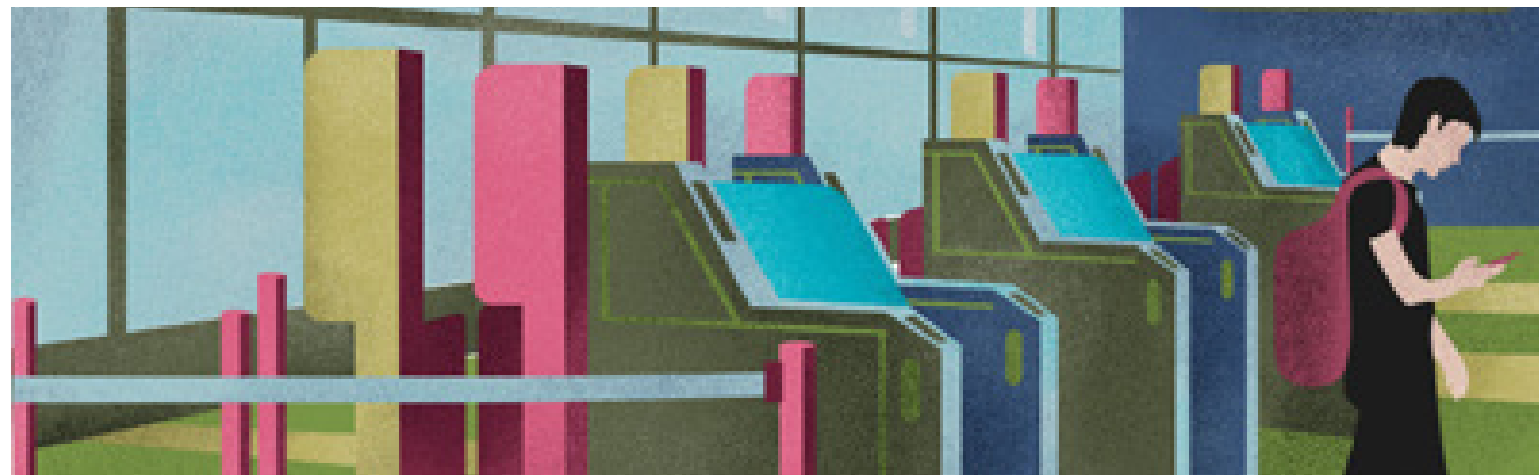
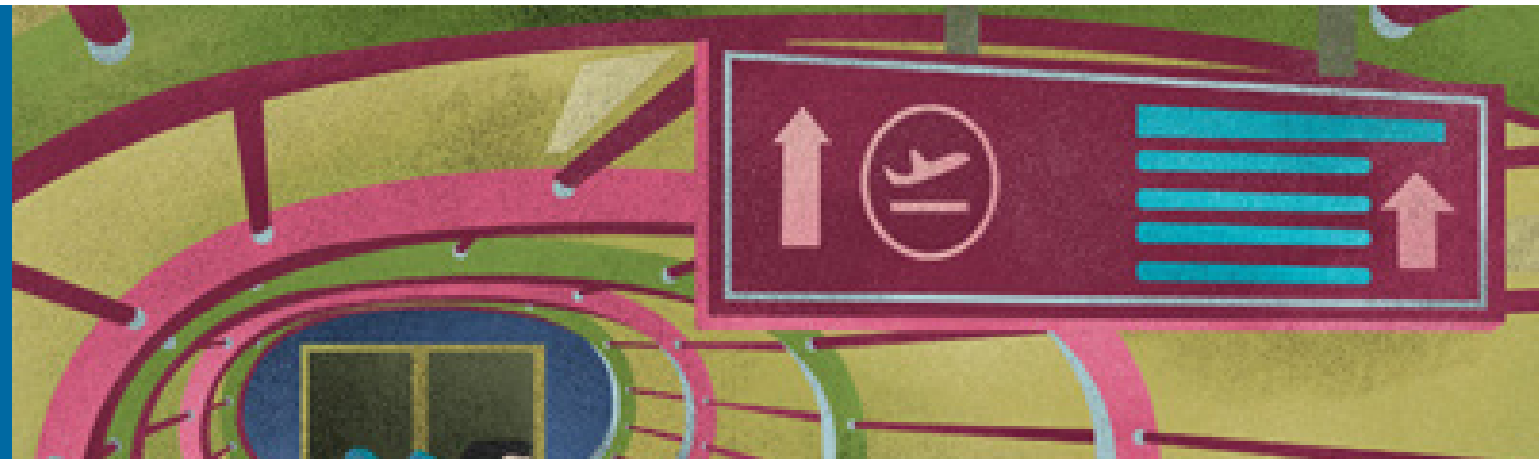




INTELLIGENT AIRPORT TROLLEY  
MANAGEMENT AND CONTROL  
SYSTEM BY **RFID**





# INDEX

|   |           |
|---|-----------|
| <b>1. Introduction to the system</b>            | <b>3</b>  |
| <b>1.1. Purpose</b>                             | <b>3</b>  |
| <b>1.2. Technical application and functions</b> | <b>4</b>  |
| 1.2.1. Technical application                    | 4         |
| 1.2.2. Main functions                           | 5         |
| <b>1.3. System features</b>                     | <b>5</b>  |
| <b>2. System composition</b>                    | <b>6</b>  |
| <b>3. Access to the system</b>                  | <b>7</b>  |
| <b>3.1. Homepage</b>                            | <b>7</b>  |
| <b>4. Introduction to the application</b>       | <b>8</b>  |
| <b>4.1. Reception of trolleys</b>               | <b>9</b>  |
| 4.1.1. List of trolleys                         | 9         |
| 4.1.2. Check and receive                        | 11        |
| <b>4.2. Inventory</b>                           | <b>13</b> |
| 4.2.1. Daily inventory                          | 14        |
| <b>4.3. Losses</b>                              | <b>15</b> |
| <b>4.4. Maintenance</b>                         | <b>16</b> |
| 4.4.1. List of repairs                          | 16        |
| 4.4.2. Add maintenance data                     | 17        |
| 4.4.3. Statistics                               | 18        |
| <b>4.5. Management of devices</b>               | <b>19</b> |
| <b>4.6. User management</b>                     | <b>20</b> |

## 1. INTRODUCTION TO THE SYSTEM

### 1.1. Purpose

The influx of passengers, security measures and tight time constraints mean that airports require very specific equipment.

Carttec's intelligent trolley management and control system helps airports with daily asset monitoring, accurate inventory, maintenance record keeping and performance monitoring of manual operations.

In this way, Carttec contributes to the management of airports, providing precision technology that facilitates day-to-day tasks.



1.2. Technical applications and functions

**RFID. Radio frequency identification**

RFID is a remote automatic recognition technology system. It identifies trolleys via radio frequency signal and accesses relevant data, which can be recorded on several devices as well as identify several cars in motion at the same time.

1.2.1. Aplicaciones técnicas



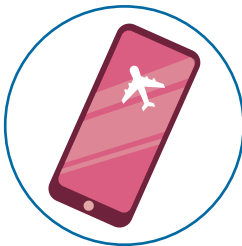
Each trolley is assigned a unique **identification code** that incorporates specific information about each asset.



With the system, you are aware of and can visualise the distribution and information of airport trolleys or specific areas in **real time**.



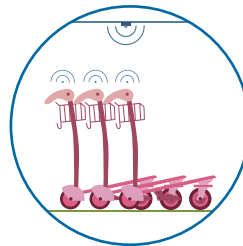
Custom configuration for **the management of the trolleys**. It is possible to access an up-to-date inventory, maintenance, breakdowns, asset list, order list and device and user management information, as well as statistics based on customer preferences.



Knowledge on the **distribution status** in real time and the **use of airport trolleys** through mobile terminals.



Trolley **breakdown log and maintenance status** which produces a relative statistical report. With the system, it is possible to obtain information about each trolley, the frequency of breakdowns and their maintenance history.



Optional fixed devices in collection **areas**, which ensure a permanent inventory at all times.

### 1.2.2. Main functions

- **Dynamic management:** Real-time trolley monitoring data
- **Identity, sending and receiving:** Data on entry and exit of airport trolleys
- **Statistics and analysis:** Trolley data stored in the cloud and statistics based on the preferences and requirements of each airport.
- **Breakdowns and maintenance:** Airport trolley maintenance data and condition records.



### 1.3. System features

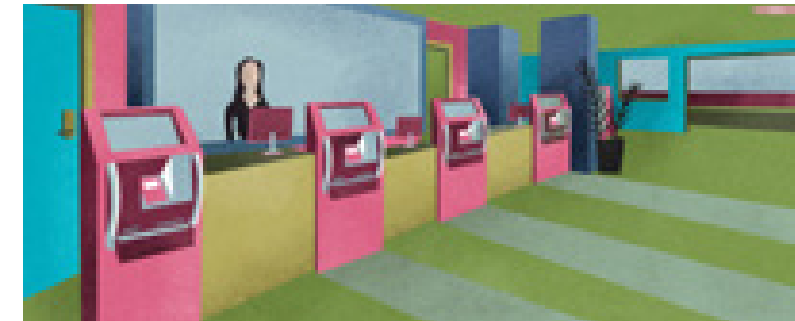
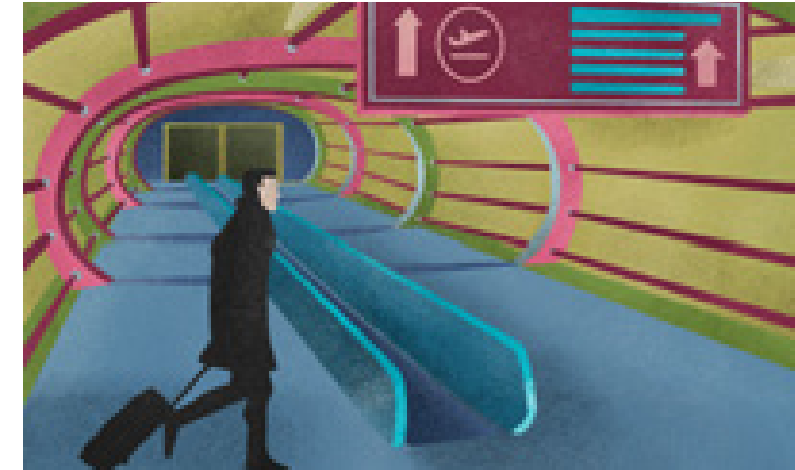
**A. Safety system:** The server storing the information is secured and backed up to maintain the integrity thereof.

**B. Progressive system:** The system applies RFID technology to establish a stable and accurate system. During operation, it supports both wireless and wired connections, and operations can be executed either by a single person or by teams working simultaneously.

**C. System reliability:** Carttec's intelligent trolley management and control system uses precise and stable tools with high levels of reliability.

**D. Practicality of the system:** The system uses a clear menu configuration, with simple and intuitive function buttons, which facilitate the consultation of data and statistics and can delve into the habits of users.

**E. System efficiency:** Based on cloud-based data analysis, the system provides accurate positional information and creates warnings for airport managers about potential incidents and current trolley usage.



## 2. SYSTEM COMPOSITION



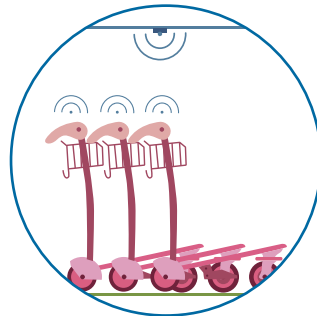
### Hardware Devices

1. RFID Tag
2. Device
3. Optional fixed devices in collection areas, which ensure a permanent inventory at all times.



### Cloud-based server

To connect the hardware and software.



Optional fixed devices in **collection areas**, which ensure a **permanent inventory** in real time.



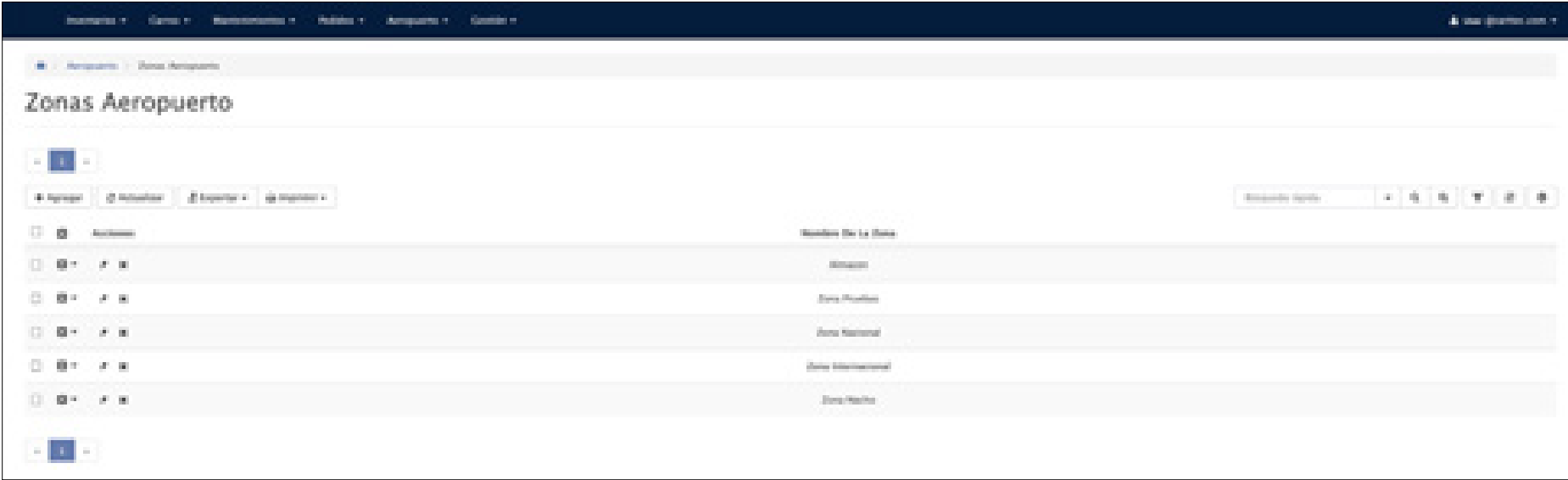
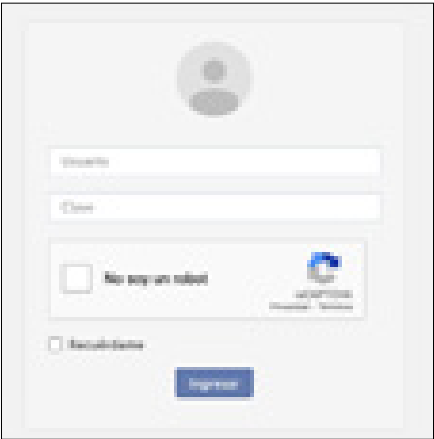
### System Software

1. Computer software compatible with Windows and IOS
2. Hand-held device with Android software







### 3. ACCESS TO THE SYSTEM

#### 3.1. Homepage

- A. Log into the software using the **link, account and password** provided by Carttec.
- B. The home page first shows the **Areas of the Airport** and in the upper menu, the different sections of the **application: Inventories, trolleys, maintenance, orders, areas and management**.
- C. The hardware features the **RFID** system and can integrate **BLE** and **Horustec** technology.



4. INTRODUCTION TO THE APPLICATION

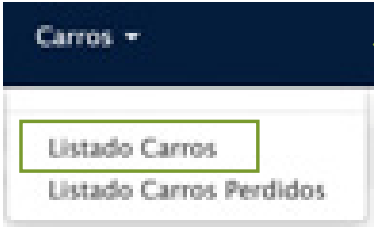
| Upper menu  | Function                          | Description  |
|---|-----------------------------------|--|
|    | Inventory                         | This section records all the <b>daily inventory information</b> , collecting data on the area, date, number of items on which an inventory has been carried out and the number of inventory assets.  |
|    | Trolley data                      | The <b>list of trolleys</b> provides the ID number of each asset, its label, the internal airport reference, whether it has been received or not, the date received, the last scan, the order number and the current area where it is located.<br>The <b>list of lost trolleys</b> shows the identifier, tag, date received, last scan, contract and airport area. |
|    | Maintenance and type of breakdown | This section records <b>data related to asset maintenance</b> , showing specific information for each fault: type of fault, gun, trolley, date of the fault, whether it has been resolved or not, comments, image of the incident and date of resolution.  |
|    | Orders                            | Registered here is <b>data related to an order</b> , showing the contract number, the date of creation, the date of shipment, the logistics company in charge, the type of product, the name of the product, those scanned and those to be scanned.  |
|  | Airport areas                     | Where the different <b>areas of the airport</b> are shown as well as the assigned name.  |
|  | Device and user management        | Displayed in <b>device management</b> is the device identifier and the description.<br>Appearing in <b>user management</b> are the full name, email and phone number to contact the user.  |



4.1. Reception of trolleys

4.1.1. List of trolleys

- 1. Click on “Trolleys” and select the “List Trolleys” option from the drop-down menu.
- 2. On the **List Trolleys** page, all assets will be listed. The information includes the identifier, the label assigned to the trolley, its internal reference, order status (received or not received), date received, last scan, order number and current area.

A screenshot of a web application interface. At the top, a dark blue header contains navigation links: 'Inicio', 'Carros', 'Mantenimiento', 'Pedidos', 'Reportes', and 'Config'. The 'Carros' link is highlighted with a green box. Below the header, a breadcrumb trail shows 'Inicio > Carros > Listado Carros'. The main title 'Listado Carros' is displayed. Below the title, there are two filter buttons: 'Filtrar' and 'Reseteo de filtros', both highlighted with green boxes. The table below has columns: 'Seleccionar', 'Icono', 'Identificador', 'Etiqueta', 'Referencia Interna', 'Estado', 'Fecha Recepción', 'Última Escan', 'Pedido', and 'Zona Actual'. The table contains 15 rows of data. The first row is highlighted. The last row has a 'Zona Actual' of 'Zona Perdida'.

| Seleccionar                         | Icono | Identificador        | Etiqueta           | Referencia Interna  | Estado | Fecha Recepción     | Última Escan        | Pedido         | Zona Actual        |
|-------------------------------------|-------|----------------------|--------------------|---------------------|--------|---------------------|---------------------|----------------|--------------------|
| <input checked="" type="checkbox"/> |       | 20240000000000000000 | EX001 (FORMA) 0000 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0001 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0002 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Moneda             |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0003 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0004 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0005 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0006 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0007 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0008 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0009 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0010 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0011 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0012 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0013 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |
| <input type="checkbox"/>            |       | 20240000000000000000 | EX001 (FORMA) 0014 | 000-000000-000-0000 | ✓      | 2023-03-01 10:45:00 | 2023-03-01 10:45:00 | 0000000000-0-0 | Zona Internacional |



Ability to export to PDF, Excel, Word, XML and CSV.

### Ajustes de página

#### Apariencia

Modo de vista

Tabla

Cantidad de tarjetas por fila

Aquí puede seleccionar la cantidad de tarjetas mostradas en una fila para cada resolución de pantalla. La resolución actual está resaltada de esta manera.

|                 |   |
|-----------------|---|
| Pantalla grande | 3 |
| Pantalla        | 3 |
| Tableta         | 2 |
| Telefono        | 1 |

#### Tamaño de página

Cantidad total de registros: 13.

Registros por página

20 (1 páginas)

Cancelar

Guardar cambios



### Constructor de filtros

Seleccionar registros donde todos + cumplan las siguientes

Identificador

Igual a

+ Agregar condición

☐ Deshabilitar el filtro

Cancelar

Aplicar

### Ordenar por múltiples columnas

+ Agregar nivel

- Borrar nivel

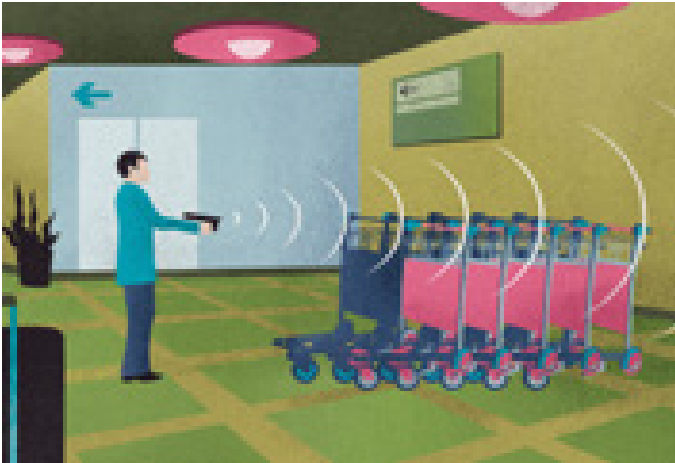
| Columna | Orden |
|---------|-------|
|         |       |

Cancelar

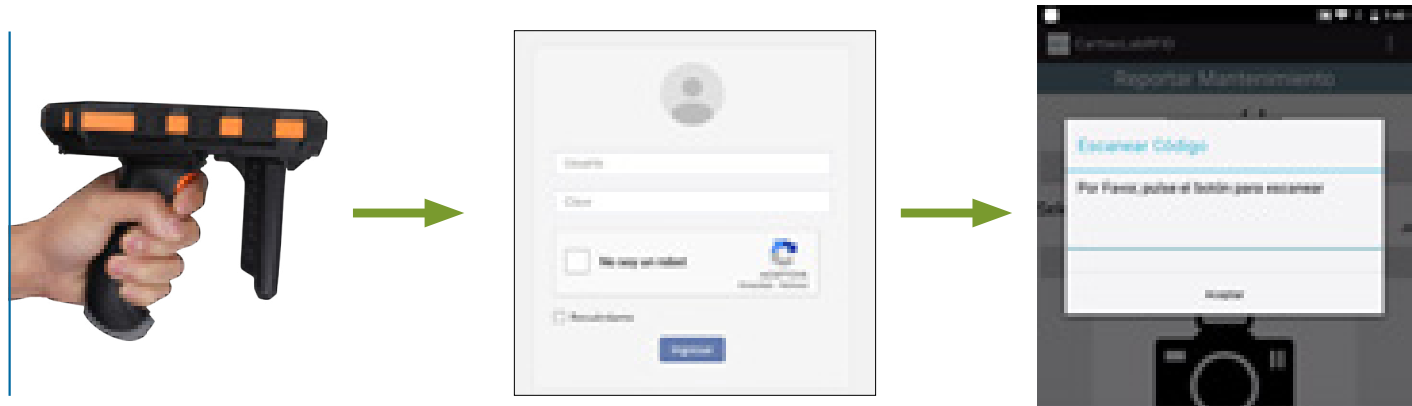
Ordenar

#### 4.1.2. Check and receive

When the goods arrive, the airport staff use hand-held devices to check the goods to confirm that the quantity and identification numbers are the same as on the order.



- Log in to the device's system and scan the code.



- The first time a trolley is scanned, the system considers it to have been received and it is added to the inventory.

| Acciones | Numero Control    | Fecha Creación      | Fecha Entrega | Empresa Logística | Tipo Producto | Numero Producto                 | Escaneados | Pendientes De Escanear |
|----------|-------------------|---------------------|---------------|-------------------|---------------|---------------------------------|------------|------------------------|
|          | W0000000000000000 | 2021-09-08 18:18:17 | 2021-09-08    | W000              | CT-0000-000   | Luggage Minimum Luggage Trolley | 11         | 0                      |

Acciones

- You can also edit it manually in **Actions** by clicking the pencil icon.

- After scanning click **Save**. The result will be saved in the cloud and the status of the trolley will appear in the **Scanned column**. Unscanned trolleys will remain in the **Pending Scan** column.

4.2. Inventory

- The **Inventory** page displays daily inventory data.
- On this screen you can search and view the historical daily inventory data.
- Click **Quick Search** to locate a specific piece of data.
- The inventory of all trolleys will appear in the table.
- You can **filter** the **device**, **area** and **date** information as follows:

The screenshot displays the 'Inventarios' (Inventory) page of a web application. At the top, there's a navigation bar with links like 'Inicio', 'Historial', 'Reportes', etc. Below the navigation bar, the page title 'Inventarios' is visible. A search bar and several filter icons are present. The main part of the page is a table with columns for 'Dispositivo', 'Zona', 'Fecha', 'Cantidad', and 'Fecha de Bajas'. The table contains multiple rows of data. Below the table, there are three modal windows for filtering the data:

- Dispositivo:** A modal window titled 'Dispositivo' with a search bar and a list of checkboxes for selecting specific devices (e.g., ACE-A-001, ACE-B-002). It includes buttons for 'Ver todos' and 'Aplicar'.
- Zona:** A modal window titled 'Zona' with a search bar and a list of checkboxes for selecting specific zones (e.g., Zona Internacional, Zona Norte). It includes buttons for 'Ver todos' and 'Aplicar'.
- Fecha:** A modal window titled 'Fecha' with a search bar and a list of checkboxes for selecting specific years (e.g., 2021). It includes buttons for 'Ver todos' and 'Aplicar'.

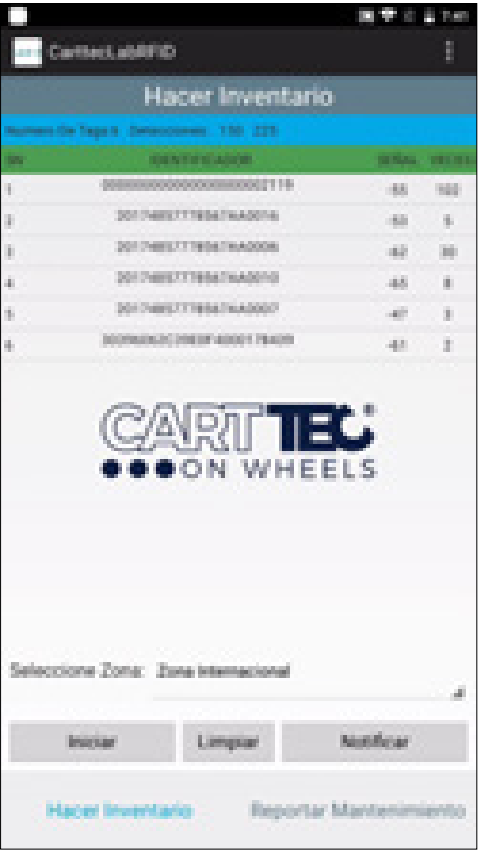
4.2.1. Daily inventory

Trolleys should be counted every day, using the device's **Inventory** function.

Click on **Inventory**, then click on **Start Inventory** and go through the airport to scan the trolleys. After scanning, click **Save** to transmit the result to the cloud server.

**Permanent installations in trolley shelters** avoid the necessity of staff having to count the trolleys located inside such shelters.

This information is **available in real time** through the application.



#### 4.3. Losses

- La página de **Perdidos** muestra los carros que faltan en el aeropuerto.
- Haga clic en **Carros**, luego **Listado de carros perdidos**. Si el inventario diario y el escaneo no pueden encontrar un carro en 3 días, el sistema reconocerá que falta el carro y aparecerá en la lista de **Perdidos**.
- En **Búsqueda rápida**, puede localizar un dato concreto
- Puede **filtrar** los datos por **fecha de recepción**, **último escaneo**, **contrato** y **zona de aeropuerto** de la siguiente manera:

The image displays a web application interface for managing lost trolleys. The main section is titled 'Perdidos' and contains a table with columns: 'Identificación', 'Estado', 'Fecha Recepción', 'Último Escaneo', 'Contrato', and 'Zona Aeropuerto'. Below the table, there are four filter pop-ups corresponding to the columns: 'Fecha Recepción', 'Último Escaneo', 'Contrato', and 'Zona Aeropuerto'. Each filter has a 'Seleccionar todo' checkbox, a search bar, and 'Ver todos' and 'Aplicar' buttons. The 'Contrato' and 'Zona Aeropuerto' filters show 'No hay coincidencias' (No matches found).

4.4. Maintenance

4.4.1. List of breakdowns

- This page shows the maintenance data of the airport trolleys.
- Click on **Maintenance** to see all the faults on the list.
- The maintenance information allows you to know the type of fault, the gun with which the trolley was registered, the specific trolley, the date on which the fault occurred, whether it was resolved or not, comments, photographs taken by the operator at the time of reporting the incident and the date of resolution.

|                          |  | Acciones | Tipos de fallo | Fotografía | Carril             | Fecha de fallo      | Resolución | Comentarios | Foto | Fecha de resolución |
|--------------------------|--|----------|----------------|------------|--------------------|---------------------|------------|-------------|------|---------------------|
| <input type="checkbox"/> |  |          | Cinturón roto  | 4/11/2023  | CH0000000000000000 | 2023-11-04 14:40:00 | OK         |             |      | 2023-11-04 15:00:00 |
| <input type="checkbox"/> |  |          | Ruedas rotas   | 4/11/2023  | CH0000000000000000 | 2023-11-04 14:40:00 | OK         |             |      | 2023-11-04 15:00:00 |
| <input type="checkbox"/> |  |          | Frente dañado  | 4/11/2023  | CH0000000000000000 | 2023-11-04 14:40:00 | OK         |             |      | 2023-11-04 15:00:00 |



#### 4.4.2. Add maintenance data

**A. From the computer application:** Maintenance data can be aggregated as follows:

+ Agregar

**Agreement**

**Type Month:**

**Period:**

**Cost:**

**Start Month:**

**Interval:**

**Comments:**

**End Month:**

[+ Create report](#)

[Agreement with agreement](#)

[Cancel](#) [Execute](#)



**Guardar**

Tipo Asiento:

Modelo:

Clase:

Fecha Asiento:

Asientos:

Comentarios:

Fecha Reservación:

The screenshot shows the 'Mantenimientos' (Maintenance) page. The table has columns for 'ID Mantenimiento', 'Descripción', 'Fecha', 'Hora', 'Estado', 'Tipo de Mantenimiento', 'Responsable', 'Comentarios', 'Asignado a', and 'Fecha Asignación'. The first row shows an 'ID' of 1. A red box highlights the 'ID Mantenimiento' header, and another red box highlights the '1' in the first row. A red dashed line connects these two boxes.

**B. From the device application:** Click Report **Maintenance** and then click **Add** to record information on the fault.

#### 4.4.3. Estadísticas

A partir de todos los datos, el sistema genera las estadísticas propias del aeropuerto. Las estadísticas estudiadas se pueden elaborar en función de las necesidades y preferencias de cada cliente.

Entre las estadísticas se pueden encontrar las referentes a carros reparados en el aeropuerto.



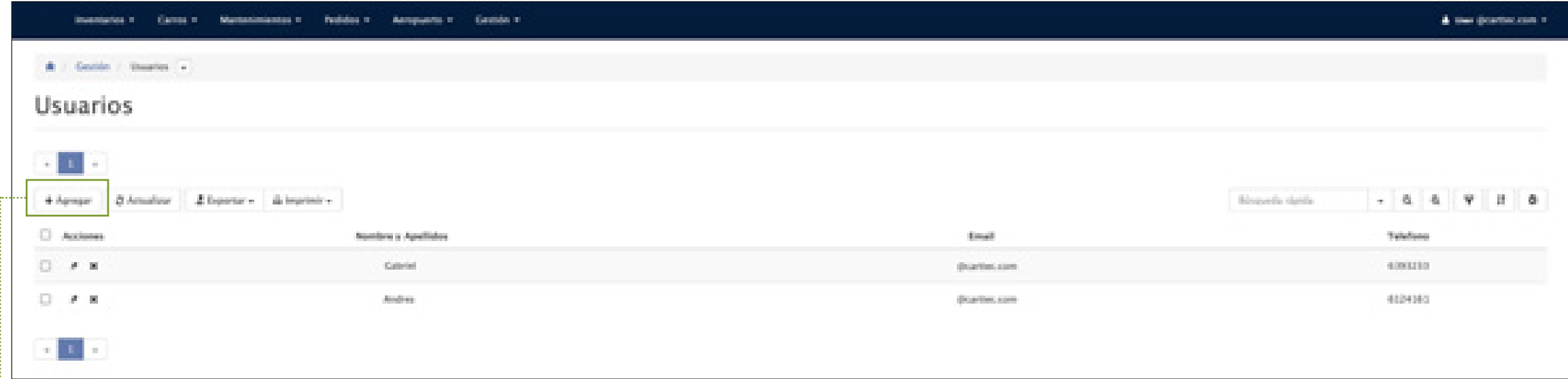
#### 4.5. Management of devices

This section manages the airport devices. Click **Management** and **Devices** in the upper menu.

Devices that have been authorised at the airport will be displayed in the list. The information includes **Actions**, **Identifier** and **Description**.

| Dispositivos   |  |                   |             |
|--|--|-------------------|-------------|
| <div>+ -</div>   |  |                   |             |
| + Agrupar    + Actualizar    + Descargar    + Imprimir |  |                   |             |
| <div>Búsqueda rápida</div>                             |  |                   |             |
| Acciones   |  | Identificador     | Descripción |
|  |  | ac00bae4d0f0c1eb4 | A01-C-001   |
|  |  | bafbbad27bc02827  | A02-B-002   |
|  |  | e7f6bca071a0000   | A03-A-003   |
|  |  | d00ba77a0004000   | A04-D-004   |
| <div>+ -</div>   |  |                   |             |

4.6. User management



This section manages the system's users.

- Click **Add** to add the new user.



[www.carttec.com](http://www.carttec.com)



[info@carttec.com](mailto:info@carttec.com)



+34 916 574 011



Carttec On Wheels



Carttec On Wheels



@Carttec

