

Fuel Management Systems

GIR W150 Software
Reference Manual

2026-09-30

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Introduction

GIR W150 is a fuel distribution management software application.

It is used with fuel distribution controllers and offers features allowing a user to:

- Define a list of vehicles (and optionally: drivers) that are allowed to take fuel.
- Synchronize data with controllers using a network connection.
- Retrieve transactions from controllers.
- Monitor and generate reports on transaction history to track vehicle consumption.
- Export transactions for reprocessing in third-party applications.

GIR W150 is a web-based application. It is installed on a single computer (the server), and can be accessed from any other computer using a web browser.

Terminology

- ***W150 server***: The computer where the application is installed.
- ***Controller***: A device that performs vehicle/driver identification, controls the fuel distribution, and stores transactions. All controllers are connected to the W150 server.
- ***Badge***: An item used to identify vehicles or drivers on the terminal. A number of vendor technologies are supported.
- ***Transaction***: A collection of data relating to a single visit by a driver/vehicle to a refueling terminal (date, time, vehicle, volume, etc.).
- ***User***: A person that connects to the application.
- ***Driver***: A person that uses a terminal to take fuel.
- ***SaaS***: Software as a Service. W150 installation option whereby the W150 server is installed and maintained from a remote server.
- ***On-prem***: On-premises. W150 installation option whereby the W150 server is installed on a customer's computer.

Chapter 1

Getting started

1.1 Connection

When you access the GIR W150 application, you will be prompted to log in using an email address and password. These will have been provided to you. Both fields are required.

If you forgot your password, you can click on the "Forgot password?" link. It will then send an email to your address to reset your password.

1.2 Home page

Once you are logged in as a user, the home page will be displayed. It displays links to the main pages of the application.

1.3 Main menu

The main menu is displayed at the top of all pages. It contains the following items:

- ***Home button***:  Returns to the home page
- ***Vehicles***: Shows the vehicles list
- ***Drivers***: Shows the drivers list
- ***Fuel transactions***: Shows a history of all fuel transactions
- ***Supervision***: Displays an overview to monitor and manage controllers, tanks and pumps
- ***Alert icon***:  Indicates that there is one or more important notifications about the system state to communicate to the user (controller offline, pump blocked, etc.). Clicking this shows the Alert panel, which contains details about all system notices

- ***Main dropdown menu***: Displays the following items when clicked:
  - *Settings*: Shows the application settings (allows for configuration of system parameters, products, users, etc.)
  – *Events*: Shows the history of all events related to the fuel system
  – *My account*: Allows to change the current user password
  – *Logout*: Closes the session and returns to the login page

1.4 Alert panel

The Alert panel is a pop-over display that conveys important information about the health of the system to the user. When there is an important notification about the state of the system, the alert icon is displayed in top-right corner of the screen. Clicking it reveals the Alert panel, with all notification messages. Clicking a message navigates to a page with further details on the nature of that particular notice. Notifications can include:
- *Controller link error*
- *Pump blocked or in manual mode*
- *Tank stock below the alert threshold*
- *Unauthorized refueling*
- *Auto. delivery without a price*
- *New auto. delivery*

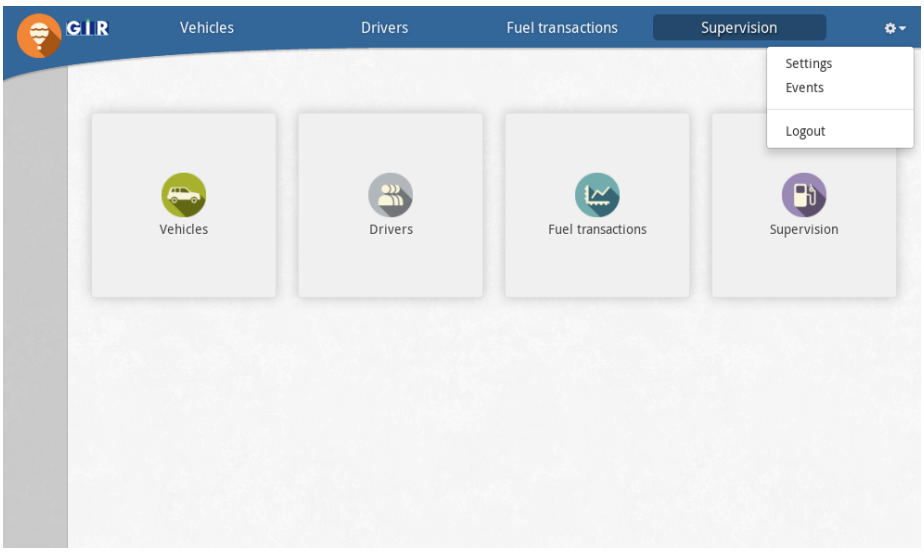
When there is nothing special to report and the Alert panel is empty, the alert icon is not shown.

1.5 Recording your first transaction

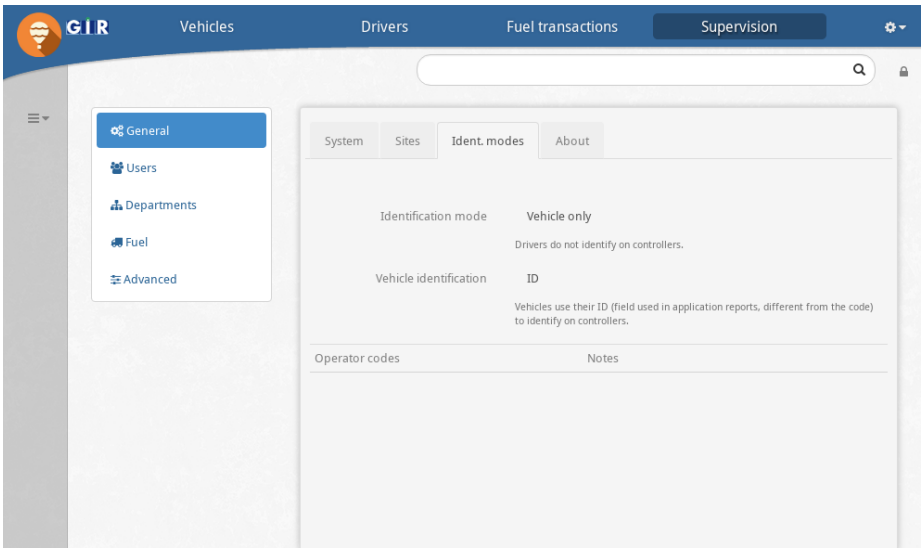
This section will explain how to configure the GIR W150 Server in order to make your first fuel transaction on the controller with a registered vehicle, starting from an empty database.

1.5.1 Set the identification mode

The first thing you will do is to configure how vehicles will identify themselves to the controllers. To do this, click on the main menu dropdown at the top right corner of the screen and click on *Settings*.



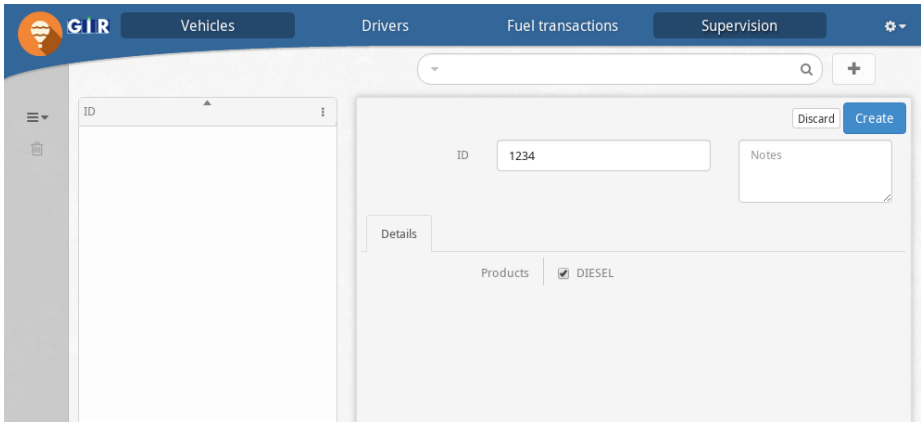
From this page, you will have access to all the W150 application settings (for more information on specific settings, refer to the Settings chapter of this document). Start by selecting the *General* section of the settings page and then select the *Ident. modes* tab within the general settings (see: Settings / Ident. modes for details). Verify that the *Identification mode* is set to *Vehicles only* and that the *Vehicle identification* is set to *ID*. In this configuration, only vehicle information (but no driver) is needed to identify at controllers, and their ID is used as the identification code.



1.5.2 Create a vehicle

You can now create a new vehicle. Click on the *Vehicles* page in the main menu. The list of vehicles in the system will be shown, which should be empty for now. Click on the ✚ icon to create a new vehicle. The *ID* field is the only one

that is mandatory, and it will be used to identify this vehicle on the controller (per the GIR W150 application settings). Enter `1234` for the ID. The *DIESEL* product should be selected by default (note that this behaviour is controlled by the *Default product for new vehicles* option for the *DIESEL* product in the Settings). Click *Create* to add this vehicle.



1.5.3 Pair a controller

The next step is to pair a controller with your GIR W150 server.

First, ensure that your controller is configured to communicate with your GIR W150 server:

1. Enter the controller setup. On a controller in factory settings, which has no app, just power up the controller and press `9`. On a controller with an app installed, set the terminal to address 15, reboot, and press `9` when prompted to do so.

2. Perform a factory reset if needed.

3. Set the communication settings:

   (a) Go to the *1:LINK* menu.

   (b) Set *LINK/MODE* to *ETH* OR *GPRS* (press `0` to edit the parameter).

   (c) Set *LINK/URL/HOST* to the URL of your app (e.g. `my-app-gir.klervi.net`).

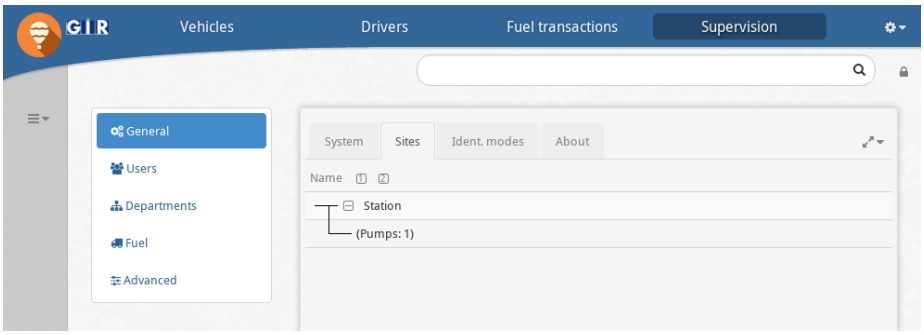
   (d) For *ETH* communication, configure the IP and DNS settings (*LINK/ETH/DHCP*, *LINK/ETH/DNS*, ...).

   (e) For *GPRS* communication, set the APN and the user/password if needed (*LINK/GPRS/APN*, *LINK/GPRS/USER* and *LINK/GPRS/PASSWD*).

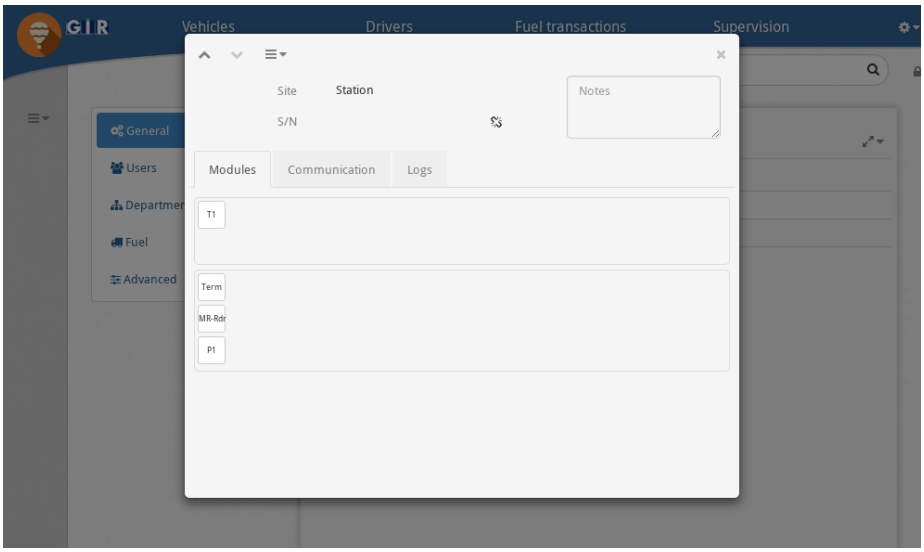
4. Go back to the main menu, press `0` to save the configuration and reboot the controller. Don't forget to restore the terminal address if you changed it. For more information on the controller setup, see the *Configuring communication* section in the *TIP-Vatersay Controller – Reference Manual* document.

Once the controller restarts, it will try to connect to the server configured in *LINK/URL/HOST*. If the connection succeeds, *G+* will show up in the link indicator at the top left of the screen. If the connection fails, *G-* will show up instead: see the *Troubleshooting* section in the *TIP-Vatersay Controller – Reference Manual* document to diagnose and fix communication errors.

Once the link indicator on your controller shows *G+*, a connection is established between the controller and the server. No more configuration is needed on the controller: the final steps of the pairing process are performed on the server. Go the Settings page, then select the *Sites* tab in the *General* section. For new installations, there should be a default site and a default controller already entered in the GIR W150 server. The site name will appear as *Station* and its controller, labeled by *(Pumps: 1)*, should appear below.

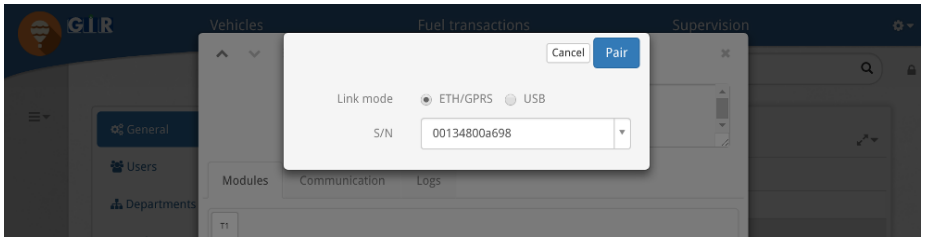


Click on the table row containing the controller *(Pumps: 1)* to display the controller editor window. The window contains various configuration settings for the controller with the GIR W150 server. From here the controller modules' configuration can be also updated (if the QSC/RSC code is entered). This window can also be used to pair your GIR W150 server with a controller by entering its serial number (S/N).



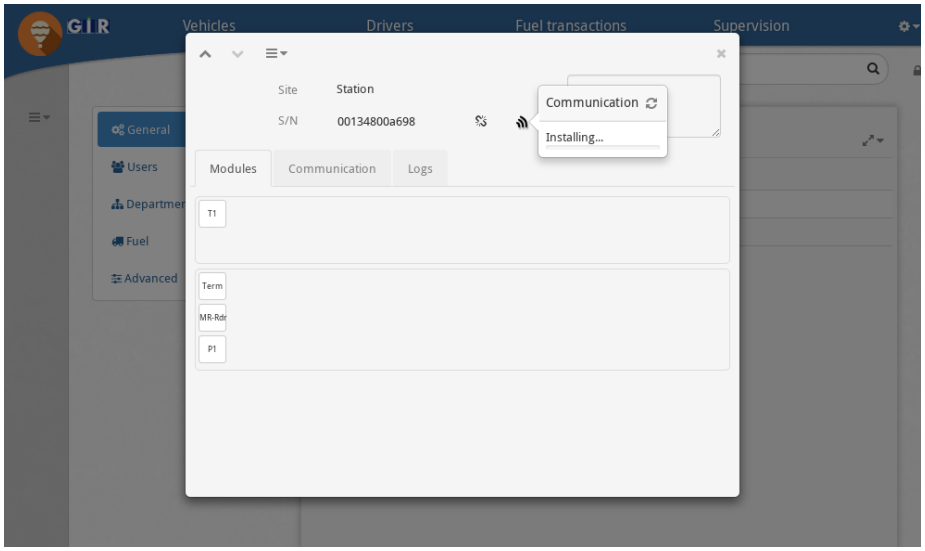
Click on the icon in the *S/N* field. A new window will be displayed, allowing you to select a serial number from a list. If you don't see any serial

numbers, it means that your controller is not correctly connected to the GIR W150 server. Click on *Pair* to begin the pairing process.

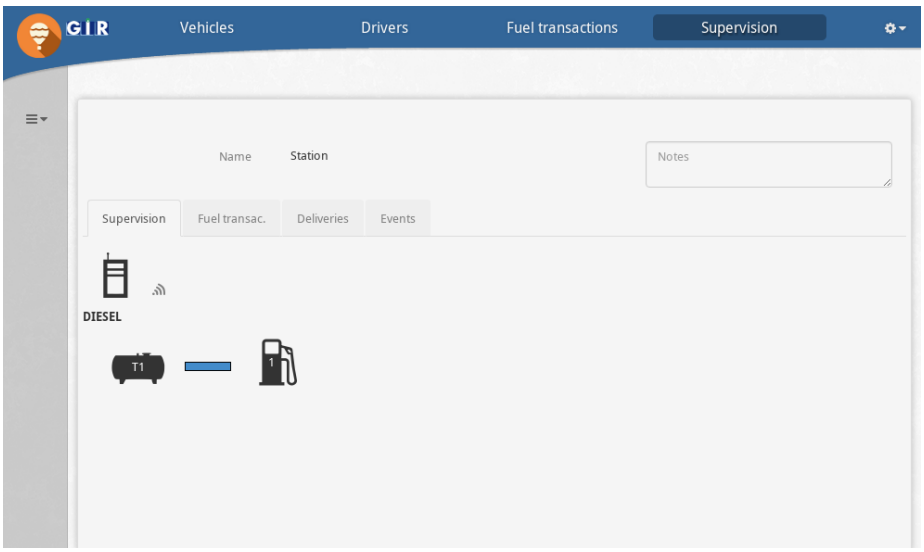


The pairing process will install a new app firmware on the controller if needed (e.g. if the controller was in factory settings and had no app), then synchronize server data with the controller. If you click on the icon next to the *S/N* field, you'll be able to check the installation status of the controller. Once the icon is displayed next to the *S/N* field with *A-OK*, your controller is paired and synchronized. This means that you can now start recording transactions.

1.5.4 Record a transaction



Close the controller window and go to the *Supervision* page. This page is automatically updated and can help you monitor in real-time controllers, tanks and pumps on your site.



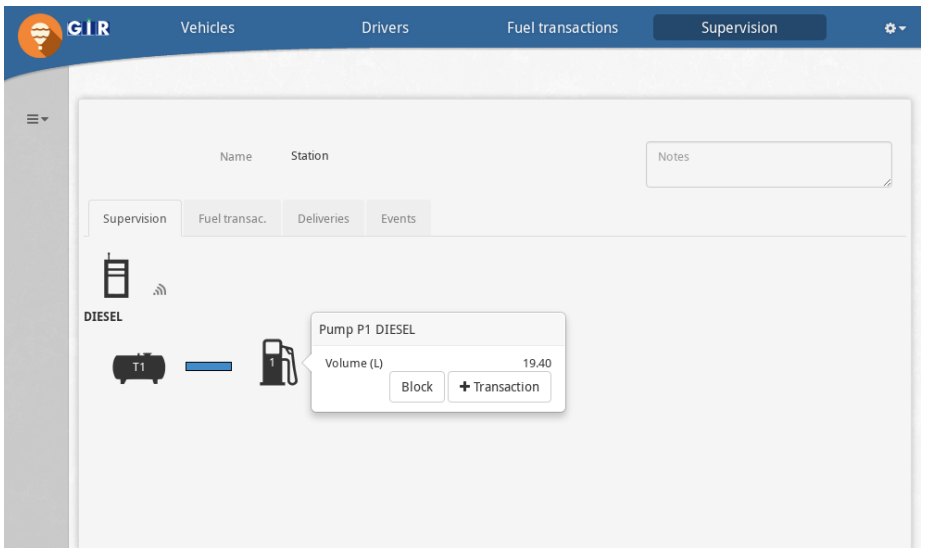
On your controller terminal screen, this is what you should see:

```
Tu 02/01/17 16:07 .+
VEHIC. CODE
```

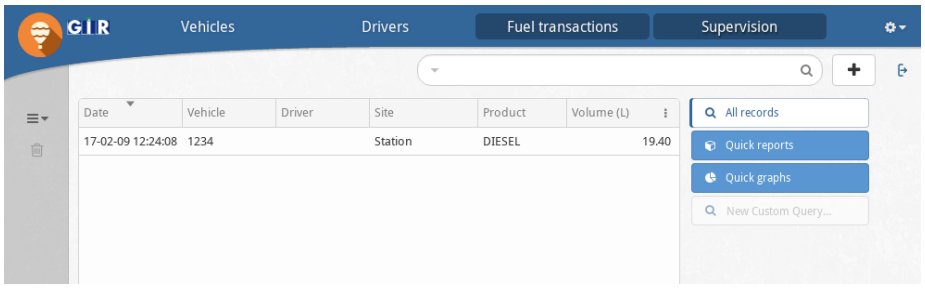
Enter your newly created vehicle code (`1234`) and validate. You should now be able to start refueling.

Meanwhile, on your GIR W150 Server, you should be able to observe the following from the Supervision page:

- While refueling, if you click on the pump icon you should be able to see the current volume distributed for this transaction.
- Once the transaction is completed, you should see a new entry in the *Fuel transac.* tab. You can click on the transaction line to see more details.
- If you click on the tank icon, you should be able to observe the volume of fuel product remaining in the tank following subtraction from the recent transaction.



Finally, click on the *Fuel transactions* page in the main menu to see the transaction history. You should see an entry in the table for transaction that you just completed. By clicking on *Quick reports* you can generate fuel consumption reports by vehicle (see: Fuel transactions / Quick reports). By selecting *Quick graphs* you can produce similar reports in graph form (see: Fuel transactions / Quick graphs).

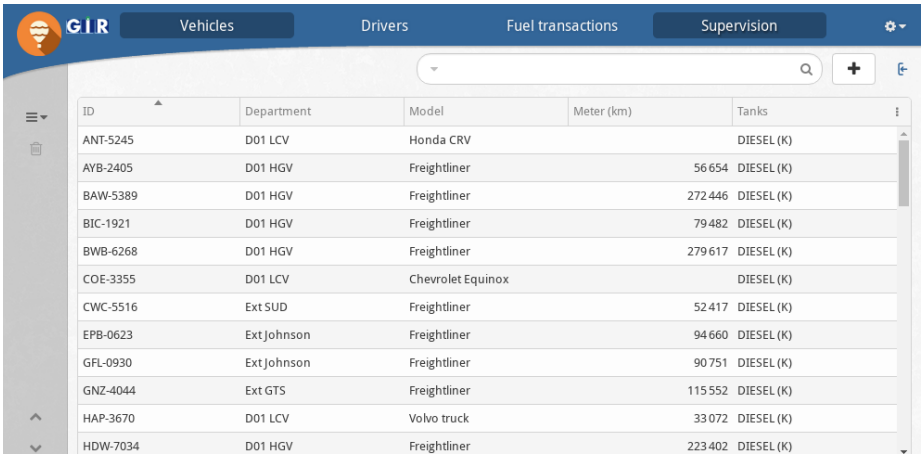


Chapter 2

Common user interface elements

2.1 Collection view

Most pages (such as the vehicles, drivers and fuel transactions pages) are organized around a collection of records and related elements – together referred to as the *Collection view*.



ID	Department	Model	Meter (km)	Tanks
ANT-5245	D01 LCV	Honda CRV		DIESEL (K)
AYB-2405	D01 HGV	Freightliner	56 654	DIESEL (K)
BAW-5389	D01 HGV	Freightliner	272 446	DIESEL (K)
BIC-1921	D01 HGV	Freightliner	79 482	DIESEL (K)
BWB-6268	D01 HGV	Freightliner	279 617	DIESEL (K)
COE-3355	D01 LCV	Chevrolet Equinox		DIESEL (K)
CWC-5516	Ext SUD	Freightliner	52 417	DIESEL (K)
EPB-0623	Ext Johnson	Freightliner	94 660	DIESEL (K)
GFL-0930	Ext Johnson	Freightliner	90 751	DIESEL (K)
GNZ-4044	Ext GTS	Freightliner	115 552	DIESEL (K)
HAP-3670	D01 LCV	Volvo truck	33 072	DIESEL (K)
HDW-7034	D01 HGV	Freightliner	223 402	DIESEL (K)

These pages generally contain the following elements:

- ***Record list***: the scrollable table displaying all of the records of the collection without pagination. Clicking on an item displays its details in the Editor. Clicking on a column header sorts the collection by this column values. Clicking again on the same header will reverse the sorting order.

- ***Column manager***: a pop-up window accessed by clicking ⋮ in the top-right corner of the Record list then selecting *Edit Columns* in the resulting drop-down menu. This window allows for showing, hiding or reorganizing of table columns.

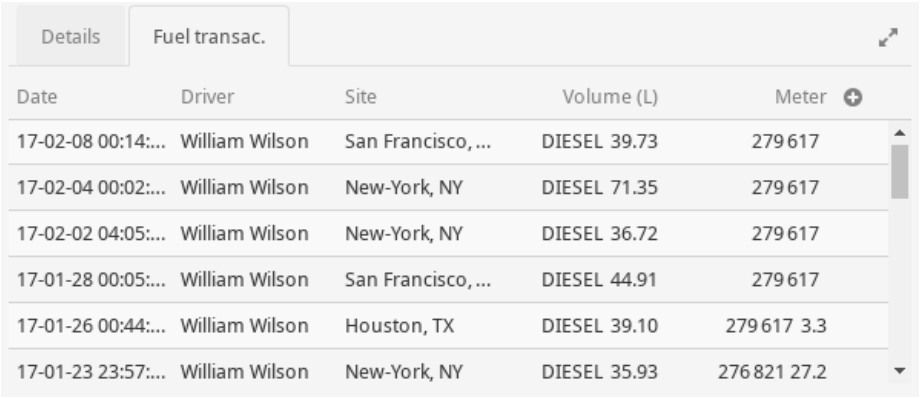
- ***Editor***: area that appears next to the table that supports viewing and modification of the selected record.
- ***Search bar***: input box at the top of the screen used to perform quick searches of the collection by entering keywords and then clicking or pressing the ENTER key. The results of the query are shown in the Record list.
- ***Advanced query builder*** : interface for performing complex queries on one or more fields.
- ***Record creation mode button*** : enters Record creation mode. Displays a form for inputting a new record that is added to the collection once the form is submitted.
- ***Action menu*** : menu of actions specific to the information currently presented on the screen. Typically contains the following items:
  - *Info*: displays information about the Record list or the selected record.
  – *Print*: prints the Record list or the selected record.
  – *Download CSV*: downloads the Record list in CSV format.
  – *Download CSV (alt)*: downloads the Record list in an alternative CSV format.
  – *Clone*: enters Record creation mode using the values from the selected record as a template.
  – *Online help*: opens the online user manual at the relevant section for this page.
- ***Delete button*** : deletes the selected record.
- ***Navigation controls*** : switches to the previous/next record when the Editor is opened.
- ***Saved queries panel*** : interface for restoring or creating a saved query.
  To create a new saved query:
  – filter the collection using the Search bar or the Advanced query builder
  – expand the Saved queries panel by clicking
  – enter a label in the *New Custom Query...* input
  – click on *Add (+)*
  To restore a query, simply click the corresponding label in the Saved queries panel.

The Editor panel typically contains the following elements:

- ***Close button*** : hides the editor panel and displays the Record list in full screen.
- ***Save / Create button*** (*Create* in Record creation mode, *Save* otherwise): Validates and saves the record data. This button is displayed once the user makes a change to a field.
- ***Cancel / Discard button*** (*Discard* in Record creation mode, *Cancel* otherwise): Cancels the changes to the record and closes the editor. Displayed alongside the Save / Create button.

2.2 Compact lists

Within the Editor view of a record you may encounter additional lists of items similar in appearance to the Record list in the Collection view. These are Compact lists. They are used to manage lists of data within records. The main difference compared to Record lists is that selecting an item in a Compact list will display an editor for that item in a pop-up window, rather than in an adjacent panel.



The Compact list generally contains the following elements:

- ***Item list***: a scrollable table. Clicking an item in the list displays an editor for that item in a new window.
- ***Item creation mode button*** : if enabled, enters item creation mode. Displays an editor in a new window for adding a new item to the list.
- ***Expand list button*** : if present, navigates to a full Collection view page for the given items.

The item editor window normally contains the following elements:

- ***Close button*** : closes the editor window.
- ***Save / Create button***: Validates and saves the data.
- ***Cancel / Discard button***: Cancels the changes to the item and closes the editor window.
- ***Delete button*** : deletes the current item and closes the editor window.
- ***Action menu*** : menu of actions specific to the current item. Usually contains the following items:
  - *Info*: displays information about the current item.
- ***Navigation controls*** : Switches to the previous/next item in the list.

2.3 Unit switching

When the *Km/Miles* feature of GIR W150 is enabled (see: Specific features), all odometer values can be dynamically displayed in either kilometers or miles. To switch between the two modes, simply click on the *Km* or *Mi* button in the bottom-left corner of the screen.
- In *Km* mode, fuel consumption is expressed in litres per 100 km (L/100)
- In *Mi* mode, fuel consumption is expressed in miles per gallon (Mpg)

Chapter 3

Settings

Application settings are accessible through the main dropdown menu in the top-right corner of the screen. The settings page is organized into 5 sections:

- ***General***
- ***Users***
- ***Departments***
- ***Fuel***
- ***Advanced***

The search bar at the top of the page can be used to quickly find a specific setting by keyword.

3.1 QSC/RSC protection

Some sensitive settings (like *Sites*, *Ident. modes* and *Products*) are read-only until a valid QSC/RSC code is entered by clicking on the lock icon: . This is intended to restrict modification of these protected settings to authorized persons possessing the proper code.

3.2 General

3.2.1 Sites

Manages sites and controllers. Protected by a QSC/RSC code.

To create a new site, click the button in the top-right corner of the table. A corresponding controller for the site will also also be created automatically at the same time. To create another controller assigned to that site, click the button at the right of the site name.

Site editor:

- ***Name***: the site name.

- ***GPS Coordinates***: latitude and longitude values separated by a comma (,). They are used to display the site in the map in the Supervision page (the map is only displayed when there is more than one site). In SaaS mode, clicking the gear icon shows a map preview, and can automatically get approximate coordinates from controller technical data, when available on Mobile or IP networks.

Controller editor:

- ***S/N***: used to pair or unpair the controller to a device using its serial number. See the Controllers chapter.
- ***Modules***: shows the modules (pumps, terminals, readers, etc.) used by the controller and allows for their customization.
- ***Communication***: displays communication events for this controller. Also contains controls to perform manual actions on the controller such as upgrade, reboot, or diagnostics (see Controllers / Communication).
- ***Logs***: displays technical logs for this controller.

When at least 2 controllers are defined on a same site, the pairing window for these controllers displayed when clicking on the ***S/N*** field contains a *Settings* tab with the following field:

- ***Label***: controller optional custom label. When not empty, this value is displayed below the controller icon in the supervision page. It is also used as a suffix everywhere controller are displayed.

The controller modules editor allows to define multiple fuelsets by clicking on `+` then `+Fuelset` or multiple accesses by clicking on `+` then `+Access`.
The controller modules editor allows the configuration of the following items:

- Tanks.
- A terminal.
- Readers.
- Pumps.
- Pump readers (reader attached to a pump).
- A receipt printer. Available on kvgca 2.0.9 or higher versions. Adding a receipt printer will add the *Receipt* tab in the *Fuel* section of the settings (see below). It will also add a *Print receipt* action in the fuel transaction editor: this action displays a window containing the receipt content for this transaction, which allows to get the receipt if the print failed.
- Gauges.

Accesses also allow to configure the following modules:

- Readers

- A command relay

Tank editor:

- ***Site***: site where the tank is located. As tanks are only referenced by a site, they are shared across all controllers in this site
- ***Number***: number used to display this tank (ex: T1, T2...).
- ***Product***: product delivered to this tank.
- ***Capacity***: total volume the tank can hold.
- ***Options***: tank options.
  - *Auto. deliveries*: displayed if the tank capacity is more than zero. This option is read-only: it shows whether automatic deliveries are enabled or not. Automatic deliveries are enabled when a tank has gauges, so this option can be "checked" by defining a gauge for the tank.
  – *Manual deliveries*: displayed if the tank capacity is more than zero. If enabled, it displays the *Theoretical volume* field, and allows to enter manual deliveries for this tank. Manual and automatic deliveries are fully separated: a tank can have either no deliveries, only manual deliveries, only automatic deliveries, or both. GIR recommends to keep manual deliveries disabled when a tank has gauges, as having both manual and automatic deliveries can cause user confusion.
  – *Unit price*: displayed if the tank capacity is more than zero, and if the *Auto. deliveries* or *Manual deliveries* option is set. If enabled, it displays the *Unit price* field. Tank price management is exclusive between automatic and manual deliveries: if manual deliveries are enabled, they manage tank price (see Supervision / Manual deliveries). Otherwise, tank prices are managed with automatic deliveries (see Supervision / Automatic deliveries unit price).
- ***Theoretical volume***: current theoretical volume of the tank. This value is decreased by fuel transactions and increased by manual deliveries, but it can also be modified manually.
- ***Gauge volume***: current volume of the tank as reported by gauges. This value is automatically updated when inventories are added.
- ***Alert threshold***: if the tank current volume goes below this value, it displays an alert on the alert panel, and sends an email alert to users that have enabled the *Tank volume below alert threshold* notification. Available if either *Theoretical volume* or *Gauge volume* are displayed. If both fields are displayed, the alert threshold uses the theoretical volume.
- ***Block threshold***: if the tank current volume goes below this value, it automatically blocks the tank pumps with the *Tank blocked* reason. Once pump are blocked, they can be unblocked with the existing pump unblocking methods. When a pump is unblocked in this situation, the pump won't be automatically blocked because of the tank stock until its current volume goes above the blocking threshold. Available only if *Gauge volume* is displayed, doesn't use *Theoretical volume*.

- ***Unit price***: defines the current unit price for this tank. Usually updated automatically, but can be modified manually as well. If the *Auto. deliveries* or *Manual deliveries* options are enabled, this value is automatically updated each time a price is set on the newest delivery.

A list of all tanks can also be accessed through the "Tanks" link near the "Settings, Sites" tab, or from the Supervision page. In the list of tanks, extra fields are available:

- ***Theoretical hullage***: amount of fuel that can be delivered into the tank, given the tank capacity and theoretical volume.
- ***Gauge hullage***: amount of fuel that can be delivered into the tank, given the tank capacity when a gauge volume is available.
- ***Gauge date***: date and time at which the gauge volume was last updated.

Terminal module:

- ***Device***: available values: *TIP terminal*.
- ***Address***: RS485 address.

Reader module:

- ***Device***: available values: *EMG Terminal*, *TLG Terminal*, *MR-Access*, *TIP Terminal (keypad)*, *MR-Access (keypad)*, *Passive RS-232*, *ISO2*, *iButton*, *iButton (legacy M232-i)*, *Tacho*, *GemProx* (depends on the features enabled, see Specific features).
- ***Address***: RS485 address (*EMG*, *TLG* or *GemProx*).
- ***Bus***: RS232 address (*Passive RS-232*, *ISO2*, *iButton* or *Tacho*).
- ***NCE code prompt***: Only displayed for *Passive RS-232*, *MR-Access* and *ISO2* readers if the NCE code prompt is enabled. If enabled, this reader will be interrogated when an NCE code is prompted on the terminal. If the reader reads a code, it will be used for the fuel transaction.
- ***Advanced script***: Only displayed for *MR-Access (keypad)* readers. Allows to select an existing advanced keypad configuration, or to create a new configuration. This configuration is then used to decode the code read from the reader.

Pump module:

- ***Device***: available values: *MR-Pompe*.
- ***Number***: the pump number. The pump will be displays as "Px" where x is the pump number. Selecting a pump number to `x` will automatically set the RS485 addresss to `x-1`.
- ***Product***: product distributed on this pump.

- ***Tank***: tank associated to this pump. When transactions made on this pump are processed, the associated tank stock is decreased.
- ***Timeout (before)***: time after which a transaction is stopped if no pulse has been detected since the pump was commanded (See Controllers / Controller usage / Pump timeouts).
- ***Timeout (after)***: time after which a transaction is stopped if no pulse has been detected, after at least one pulse occurred (See Controllers / Controller usage / Pump timeouts).
- ***Pulses/L***: number of pulses per litre for the counting device.
- ***Options***:
  - *Block after 3 null transactions*: if set, automatically blocks the pump after 3 successive null transactions.
  - *Record unauthorized refuelings*: if set, when an unauthorized refueling is detected, a transaction is stored with its date, duration and volume.
- ***Mode***: pump mode. Available values: *Simple (C1)*, *Double (C1=C2)* and *Addition (C1+C2)*.
- ***Hangup***: pump hangup setting. It defines if a transaction ends when the RP input of a pump module changes. Available values:
  - *Auto*: the open/closed direction is automatically detected during the first transaction following an electrical restart.
  - *On opening*: transaction ends when the RP input changes to open (RP:0→1).
  - *On closing*: transaction ends when the RP input changes to closed (RP:1→0).
  - *None*: no hangup, transaction ends according to other criteria on volume and duration.
- ***Address***: RS485 address.
- ***Max duration***: Maximum duration of transactions for this pump, in minutes.

Pump reader module:

- ***Device***: available values: *BS125*, *RPK* (depends on the features enabled, see Specific features).
- ***Channel***: selects the device input (*RPK* devices only). There can be at most 8 pump readers attached to the same device in a controller.
- ***Bus***: RS232 bus for the device.
- ***Identification***: determines how the reader is used for identification. Possible values:

  - *With terminal*: the reader requires terminal interactions to identify badges and start transactions
  - *Without terminal*: the reader doesn't require terminal interaction to identify badges and start transactions
  - *Both*: the terminal can be used with or without terminal interaction
  - *Both with end*: same as *Both*, but transactions started with terminal using a pump reader can still be stopped like a "Without terminal" transaction using the *End* parameter

- ***Start (s)***: Time in seconds after which the transaction without terminal start from the moment where a same badge is first detected by the reader (only displayed if the *Identification* field is not set to *With terminal*). If set to empty, the transaction starts as soon as a badge is detected.

- ***End (s)***: Time in seconds after which the transaction without terminal stops from the moment when the badge is no longer detected by the reader (only displayed if the *Identification* field is not set to *With terminal*). If set to empty or zero, the transaction don't stop if the badge is no longer detected by the reader, or if another badge is read.

- ***Hangup control***: Nozzle hangup control option (only displayed if the *Identification* field is not set to *With terminal*). When this option is enabled, the transaction without terminal only starts after a successful identification if the pump RP input detects that the nozzle is released, which only works if the pump *Hangup* setting is not set to *Auto*.

Receipt printer module:

- ***Device***: available values: *Hengstler*, *Epson*, *Generic*.

- ***Bus***: RS232 bus.

Gauge module:

- ***Device***: available values: *4-20 mA*, *0-5 V*, *Veeder-Root*, *i201 height-only*, *Hectronic*, *Piusi Ocio*, *4tech*, *Start Italiana*, *OLE*, *Horn/Tecalemit*, *Technoton*, *Weldann-console*, *Weldann-probe* and *Gespasa Genius*.

- ***Probe***: selects the gauge output (all devices except *Piusi Ocio*, *OLE* and *Gespasa Genius*).
  - For *Start Italiana* gauges, the *Probe* field allows to select values from 0 to 99999. This value represents the device serial number.
  - For *4tech* gauges, the *Probe* field allows to select the "tank" channel on the console with address 0.

- ***Modbus***: selects the gauge output using this Modbus address (*OLE* and *Gespasa Genius* devices only).

- ***Tank***: tank associated to this gauge.

- ***Strapping chart***: strapping chart of the gauged tank, when applicable. Strapping charts are defined in Settings / Fuel / Strapping charts. They contain a name, and a list of height/volume couples (or percent/volume couples for *4-20 mA* and *0-5 V* gauges). Strapping charts are only available for gauges that don't directly return a volume value, i.e. gauges that return just a height or a ratio. For gauges that can return a volume value, such as *Veeder-Root* or *OLE*, the height-volume translation is typically configured directly on the gauge device console. The *Technoton*, *Weldann-console* and *Gespasa Genius* gauges can return both a volume or a height value, in that case the volume value is used only if the *Strapping chart* field is not defined.

- ***Fuel offset***: offset for the gauge fuel height, only visible for height-based gauges. When defined, this offset is added to the original fuel height value reported by the gauge, before resolving the volume value using the strapping chart. The effective height value, displayed in the application supervision menu or the "gauges" menu on controller, is the result after applying the offset:
  Effective height = Original height + Offset
  The offset value can be negative to handle cases where the effective height is smaller than the original height.

- ***Water offset***: offset for the gauge water height, only visible for height-based gauges which report a water height value. It is completely equivalent to the fuel offset, but applies to the water height instead of the fuel height.

- ***Options – Ignore probe err.***: only available for the *Hectronic* and *Horn/Tecalemit* gauges. When enabled, this option silently ignores errors reported by the probe (ex: temperature errors).

- ***Address***: RS485 address (*4-20 mA* and *0-5 V* devices only).

- ***Bus***: RS232 bus (all devices except *4-20 mA* and *0-5 V*).

Command relay module:

- ***Device***: available values: *MR-Lecteur*, *MR-Access*.

- ***Relay duration (s)***: duration during which the relay is activated after an identification

- ***Address***: RS485 address

The controller modules editor also contain the following fuelset options:

- ***T. Vol (s)***: defines how long the transaction volume is displayed after the end of the transaction. If set to 0, the volume is not displayed during the transaction as well.

- ***Prompt timeout (s)***: defines how long the user can input something on the terminal before it timeouts. Possible values: 20 (default), 90 or 180 seconds. Requires at least kvgca 2.2.0.

- ***Pump selection***: defines when the pump is selected. Allows to select two values:
  - *Before identification*: pump selection is done before identifying a vehicle and a driver (default value).
  - *After identification*: pump selection is done after identifying a vehicle and a driver. Auto-selects a pump if the vehicle only uses one product and if there is only one pump for that product in the fuelset.

- ***Vehicle reuse (min)***: displayed when the identification mode is *Driver + Vehicle*. Allows to quickly reselect the same vehicle as before when the same driver identifies several times on the same terminal. If meters (odometer or hour meter) were entered on the previous identification, they will be reused as well. On the fuel transaction editor, if a vehicle has been reused, a *Vehicle Auto. (Vehicle reuse)* tooltip is displayed at the right of the *Vehicle* field. Same thing for the *Odometer* and *Hour meter* fields. Possible values:
  - *None*: vehicle reuse is disabled (default value)
  - *3*: vehicle reuse is enabled for 3 minutes after the driver ident.
  - *10*: vehicle reuse is enabled for 10 minutes after the driver ident.

- ***Disable gauges menu***: disables the access to the gauges menu which was added since kvgca 2.2.0.

- ***Force pump selection***: displayed when there is only one pump and the *Pump selection* option si set to *Before identification*. Forces the selection of the pump on the terminal before displaying the identification screen.

The controller modules editor also contain the following access options:

- ***Name***: customized access name

- ***Identification***: defines if the access identifies drivers or vehicles

3.2.2 Ident. modes

Configures how vehicles and drivers identify themselves to controllers. Protected by a QSC/RSC code.

- ***Identification***: defines which entities must be identified to controllers. Possible values are:
  - *Vehicle only*: the controller only requests vehicle identification. Hides the driver page and all references to drivers.
  – *Vehicle + Driver*: the controller requests vehicle identification, then driver identification.
  – *Driver + Vehicle*: the controller requests driver identification, then vehicle identification.
  – *Account only*: same thing as *Vehicle only*, but replaces the *Vehicle* label as *Account* in the application interface. Changes the controller identification prompt label to `"BADGE"`, `"CODE"` or `"ID."`.

- **Vehicle identification**: defines the identification method for vehicles. Possible values are:

– *ID*: Vehicles use their ID (the field used in application reports – different from the code) to identify to controllers.
– *Code (hidden)*: vehicles use their code (different from the ID used in application reports) to identify to controllers. The code won't be displayed on the terminal.
– *Code (visible)*: vehicles use their code (different from the ID used in application reports) to identify to controllers. The code will be displayed on the terminal.
– *EMG badge*: vehicles use EMG badges to identify to controllers.

- ***Driver identification***: same thing as vehicles except that the *ID* method is replaced by *Name* in which drivers use their name to identify to controllers.

Operator badges / Operator codes: at the bottom of the Ident. modes tab is a list of special codes or badges. They can be used to replace a normal identification. When an operator badge or code is used on the terminal, it prompts for a vehicle code. The transaction will then be assigned to the selected vehicle (see: Controllers / Operator identification).

- ***Badge***: operator badge (when vehicles or drivers are identified with a key).
- ***Code***: operator code (only when both vehicles and drivers are identified with a code).

3.2.3 System

Defines the language, localization and email settings.

- ***SMTP***: SMTP server through which all emails will be sent. When set, a "Test" button at the right of the field allows to test sending an email with this SMTP server, with a detailed error message
- ***Email From***: sending address of all the emails sent by the application. Ex: `noreply@company.com`.
- ***Backup directory***: when defined, all the backups generated in `data\backup` will be copied to that directory as well. When it does, a *Backup* audit trail entry is added. It contains *OK* if the copy is successful or *Error:* followed by the error message (available for On-Prem apps only).
- ***Public URL***: URL of the application accessible outside of the local network.
- ***Language***: default language of all users.
- ***Currency***: currency used in the application.
- ***Date format***: date format used in the application.
- ***Number format***: number format used in the application.
- ***Weeks mode***: defines which day is the first of the week.

3.2.4 About

Displays technical information about the application, the server, the maximum number of paired controllers and the current user's web browser.

In the *Support* field there is a *Send data...* button that will send a support file to the support team for further analysis when something is wrong on the application. A support file contains the application database and technical logs. Two options are available: either send the full database (which could take some time depending on the database size), or send a partial database (which only contains the most recent transactions and technical logs).

Once a support file is generated, you can track the sending progression and optionally download the support file to send it by another way. From there, you can also cancel the sending or send a new support file.

3.3 Users

3.3.1 User editor

- ***Email***: email address used by the user to log in to GIR W150 and by the system to contact the user.

- ***Authentication***: available for SaaS applications only: allows to select the identification method for this user. If *Password* is selected, the user has to connect using the email and password credentials. If a Single Sign On (SSO) service is selected, then the user doesn't use a password, but his account on this service. After the user is created, an icon next to this field allows to send an email to this user containing the application URL and the user credentials. Possible values:
  - *Password*: the user uses password to login (default value).
  – *Microsoft*: the user uses his Microsoft account to login. Displays a *Login with Microsoft* link on the login page, redirecting the user to the Microsoft login page.
  – *Google*: the user uses his Google account to login. Displays a *Login with Google* link on the login page, redirecting the user to the Google login page.

- ***Password***: password the user uses to log in. Displayed when *Authentication* is set to *Password*.

- ***Name***: family name of the user.

- ***First name***: first name of the user.

- ***Level***: defines the authorization level.
  – *Admin*: the user can modify all data, users and system settings.
  – *Manager*: the user can modify all data and other settings.
  – *Limited manager*: the user can modify all data but no settings.
  – *Consult*: the user has read-only access to all data.

Notifications tab: defines notification emails for users. Click on to add a new rule. Note that in order to send emails, the *SMTP* setting must be defined in General / System, so this tab is not visible if this setting is empty.

- ***All sites***: the selected notifications will be sent for all sites.
- ***Select a site***: the selected notifications will be sent only when they concern a specific site.
- ***Controller link***: notify when controllers go online or offline.
- ***Pump block***: notify when pumps are blocked or unblocked.
- ***Manual pump mode***: notify when pumps switch to manual or automatic mode.
- ***Tanks stock***: notify when a tank current volume goes below the alert threshold.
- ***Unauthorized refueling transactions***: notify each time that an unauthorized refueling is detected.

Last activity tab: contains two sections described below. An icon at the top right corner of the tab allows to access to the dedicated pages for each section:

- ***Audit trail***: history of modifications done by this user
- ***Email logs***: last emails sent to this user

3.3.2 Password recovery

When a user loses his password, there are several ways to recover an access:

- Click the "Forgot password ?" link on the login page, and enter the user email address. This is only possible when the login is an email address, and when the application has the ability to send emails ("SMTP" and "Email from" configured).
- Log in with an admin account, and go to "Settings, Users" to generate a new password for the user.

If none of the methods above are applicable, and you are using a SaaS app, you can contact the tech support, who will restore your access.
If you are using an OnPrem app, a last resort method exists. It requires an access to the server machine:

- If you have desktop access to the server machine, there should be a GIR W150 shortcut on the Windows Desktop. Click it to log in automatically.
- If not, make sure you have access to the application directory on the server hard disk (typically c:\girw150\data\).
- Open a web browser on <app_url>/adminlogin.
- If you're on the local machine (localhost), you'll be logged in automatically.

- Otherwise, you'll be prompted to enter an "Admin ID" code, which can be obtained by looking for a file named adminid-*.txt in the data\tmp directory. Filling in the code will log you in with an admin account, which can be used to reset passwords on other user accounts.

3.4 Departments

3.4.1 Department editor

Each vehicle and driver can be assigned to a department. Departments are used for grouping transactions for reporting purposes (see: Fuel transactions / Quick reports).

- ***Name***: the department's name.

3.5 Fuel

3.5.1 Products

Manages all the fuel products used in the application.

You can manually order products by clicking on the *up* or *down* icons to the left of the product name. This will define the default order each time products are displayed.

Product editor:

- ***Name***: the product name.
- ***Type***: the product type. Possible values are:
  - *Fuel main engine (e.g. Diesel, Unleaded, Super, etc.)*
  – *Fuel secondary engine (e.g. Red Diesel)*
  – *Additive (e.g. DEF)*
  – *Other*
- ***Default for new vehicles***: if *Authorize by default* is checked, this product will be selected by default each time a new vehicle is created.

3.5.2 Models

Manages vehicle models. Models assist in grouping vehicles with similar characteristics.

Model editor:

- ***Name***: the model name.
- ***Options***:
  - *Activity code*: if set, vehicles of this model will have to select an activity before each transaction.
  – *NCE (Non Checked Entry) code*: if set, vehicles of this model will have to enter a code before each transaction.

A separate tab is shown for each of the product types:

- ***Products***: shows the products belonging to the product type (Fuel main engine, etc.).
- ***Capacity***: defines the vehicle tank maximum capacity for this product
- ***Vol. max every (h)***: if **Capacity** is defined, limits how often a vehicle can take this amount of fuel.
  - *Unlimited*: A vehicle can refuel indefinitely
  – *1h – 24h*: A vehicle can take at most **Capacity** during the specified period
- ***Meter(s)***: configures the metering policy for vehicles of this model that use the specified products:
  – *None*: no meter is required.
  – *km/mi*: odometer entry (km/mi) is required before starting a transaction.
  – *h*: hour meter entry (hours) is required before starting a transaction.
  – *km/mi + h*: both odometer (km/mi) and hour meter (hours) entries are required.
- ***Odometer*** (km/mi): optional restriction on odometer values (this setting is displayed only when km/mi or km/mi + hours meter is required).
  – *without control*: all values are accepted.
  – *range*: limits accepted odometer values to within *range* above the previously-recorded value. A value outside of this range can be forced if entered twice.
  – *range (strict)*: limits accepted odometer values to within *range* above the previously-recorded value. A value outside of this range can not be forced.
- ***Meter*** (h): optional restriction on hour meter values.

3.5.3 Additional prompts

This tab configures which additional prompts are enabled for drivers or vehicles. It is protected by QSC/RSC code.

Available additional prompts:

- ***NCE code***: Non-checked entry code
- ***Activity***: Allows to select an activity code in a list

If *NCE code* is enabled, it displays the *"NCE code"* text field which allows to customize the "NCE code" label.

If *Activity* is enabled, it displays the *"Activity"* text field which allows to customize the "Activity" label. It also displays a list at the bottom of the tab which configures the activities that can be selected when an activity code is required on the controller.

Activities

Activity editor:

- ***Name***: the activity name displayed in reports.
- ***Code***: the activity code used in controllers.

3.5.4 Suppliers

This tab is displayed when at least one tank has manual or auto deliveries enabled. Allows to define suppliers for manual and auto deliveries. When at least one supplier is defined, this adds a *Supplier* field in the manual and auto deliveries editors.

Supplier editor:

- ***Name***: the supplier name.
- ***Notes***: additional text field for comments.

3.5.5 Strapping charts

This tab is only displayed if a controller has defined a gauge module that needs a strapping chart. It is possible to connect digital readout gauges to tanks in order to monitor in real-time the amount of fuel that is left in a tank in the Supervision page. Some gauges output units other than volume, such as the height of the fuel level. For such cases, a strapping chart is used: a table of values to to convert gauge values (mm/inches) to volume (litres/gallons). These lookup tables are managed here.

The strapping chart editor (used to create or edit a strapping chart) has the following elements:

- ***Name***: strapping chart label.
- ***Type***: type of units output by the gauge — *mm (Piusi OCIO, Hectronic, ...)* or *% (4-20mA, 0-5V)*.
- ***Table***: spreadsheet interface for editing the strapping chart data.
- ***Graph***: graphic representation of the strapping chart data. This is useful to spot incorrect values.
- ***CSV Data***: text input box for direct editing of strapping chart data in CSV format.

3.5.6 Receipt

This tab is only displayed if a receipt printer is defined in at least one controller modules configuration. It contains receipt printing settings that apply on all controllers.

Available printing settings:

- ***Number of copies***: defines how many receipts will be printed each time a print is required.
- ***Print mode***: configures the printing strategy. Either receipts are printed on each transactions for all vehicles, or there is a prompt that asks drivers if they want to print the receipt or not.
- ***Format***: selects the content of the receipt printed. If *Custom* is selected, it allows to customize the receipt content with a script in lua. In the script form, a *Test* button allows to test the lua script against the latest transaction received by previewing the receipt content for this transaction.

3.6 Advanced

3.6.1 Audit trail

Lists the activity history of all the application users. The audit trail can be used to track down changes to a specific record or by a particular user.

3.6.2 Features

This tab manages specific features detailed in the chapter Specific features. It is protected by QSC/RSC code and is hidden until successful code entry.

3.6.3 Impexp

The options in this tab configure how fuel transactions are exported to other third-party software. For more information on this subject, please refer to the Export appendix.

- ***Impexp API key***: API key allowing to use the impexp API web services. A gear icon at the right of the field opens an advanced window containing the following parameters:
  - ***Impexp API key***: allows to generate a new API key or reset a previous value
  - ***Authorization***: defines the permissions of the web services using this API key. Possible value:
    - *Read/Write*: the impexp API web services can view and edit records (GET, PUT, POST and DELETE methods)
    – *Read-only*: the impexp API web services can only view records, but edition is forbidden (only GET method
    – *Disabled*: the impexp API web services are all disabled

- ***Format***: defines the file export format of fuel transactions. Possible values:
  - *GIR C4*: described in the Export appendix of this document.
  – *GIR HLF1*: described in the *HLF formats* appendix of the GIR W100 user manual.
  – *Custom*: defines a custom format, by setting a lua script accessible from an icon at the right of the *Format* field. The script allows to define a header, a footer, and to customize each line output along with the filename. It also allows to define an optional output directly where the file is copied. A *Test* button in this window allows to test the custom script against the 10 latest fuel transaction in the database. An error message displayed on the top of the window if something went wrong during the script execution. The *Console logs* tab displays the logs registered with the lua `print()` function.

- ***Type***: defines the method of export.
  - *Scheduled*: transactions are automatically exported into a file in the server data directory. When selected, the *Export...* action in the Fuel transactions page allows to browse the last exported files. This action

also shows a *On demand export* tab which allows to perform a new export manually.
– *On demand (creation date)*: transactions are exported from the Fuel transactions page by selecting a date range.
– *On demand (visible transactions)*: transactions are exported from the Fuel transactions page. All the transactions displayed in the collection are exported. If some controllers impacted by the current collection filter are not synchronized for the selected period, this will display a warning in the export window.

- ***Transac. change***: defines the export behavior with respect to modified transactions.
  – *None*: do not export the changes made to transactions.
  – *Update*: add one new line to the export for each change made to transactions.
  – *Diff*: add two lines (one with a negative volume, the second with a positive volume) for each change.

- ***Scheduled export***: when *Scheduled* is selected, defines when the export is done.
  – *Every n minutes*: sets an export frequency in minutes. Setting the frequency to 1 minute performs a real-time export, with one file per transaction.
  – *Once a day*: sets the time of day when the export is performed.

- ***Common options***:
  – *Don't export external transactions*: if checked, export only transactions from stations managed by the application (see: Fuel transactions / Manual transaction entry).

- ***GIR C4 format options***:
  – *Don't add header to exports*: if checked, omit the first line with column headers to the CSV file.

- ***GIR HLF1 format options***:
  – *Delimiter*: selects which character (semicolon **;** or comma **,**) separates each field in the CSV file.
  – *Extension*: selects file extension (txt, csv or dat).

- ***Last export***: when *Scheduled* is selected, this read-only field indicates the date of the last automated export of fuel transactions.

Chapter 4

Vehicles and drivers

Vehicle and driver lists are maintained in GIR W150 to authorize and to track fuel transactions. They are identified to controllers either by presenting a badge or entering a code. This information is captured during each transaction and stored along with other relevant details (date, volume, etc.) in the transaction record.

Driver identification is optional and depends on the settings of your GIR W150 server (see: Settings / General / Identification modes).

4.1 Vehicles

Vehicle editor fields:

- ***ID***: text label for the vehicle to be used throughout GIR W150 . Used in all lists and reports of the application.
- ***Department***: associated department for the vehicle. Can be used as a criterion in reports and related histories.
- ***Badge/Code***: depending on the vehicle identification mode setting, defines either the badge number or the code used for identifying the vehicle to controllers.
- ***Odometer/Meter***: current meter value. This field is automatically updated with the meter data entered during fuel transactions. Generally, a vehicle meter should not be modified manually. The only case where this might be necessary is to correct an invalid meter entered during a transaction that causes subsequent meter values entered at terminals to be rejected.
- ***Model***: associated model for the vehicle. It can be used as a criterion in reports and related histories, and also defines several settings that will apply to the vehicle.
- ***Products***: List of all products authorized for the vehicle.
- ***Options***: only displayed if at least one option is available
  - *No gas mileage computation*: displayed if the vehicle as meter prompt

enabled. When enabled, this option prevents from computing the *Covered* and *Cons.* fields in fuel transactions for this vehicle, which can be useful when a vehicle record is shared by many physical resources.

Fuel transac.: Compact list of all fuel transactions associated with the selected vehicle, starting with the most recent. From here it is possible to expand this view and browse these records from the *Fuel transactions* page or to manually create a transaction record for this vehicle .

Access tr.: Compact list of all access transactions associated with the selected vehicle. This tab is displayed only if at least one access is defined in controllers, and if they identify vehicles. From here it is possible to expand this view and browse these records from the *Access transactions* page .

Note that if the *Advanced vehicle options* feature is enabled in the application settings, all of the options defined in Models will also be available to define on a per-vehicle basis in the *Options* field (see: Settings / Fuel / Model).

4.1.1 Department reassignment

When a fuel transaction is processed, the department of the vehicle is stored in the transaction record. This way, when a vehicle department changes, existing transactions remain assigned to the previous department while future transactions will be assigned to the new department.

In practice, the vehicle department is not always changed at the exact time of its administrative transfer. Therefore, when a vehicle department is changed, the application will prompt to change the department in previous fuel transactions for that vehicle.

Possible actions:

- Re-assign all of the vehicle fuel transactions to the new department.
- Re-assign some of the vehicle fuel transactions to the new department given some time range.
- Don't change existing transactions.

4.2 Drivers

Driver editor fields:

- ***Name, First name***: fields used to label to the driver throughout GIR W150 . Used in all lists and reports of the application.
- ***Department***: associated department. It can be used as a criterion in reports and related histories.
- ***Badge/Code***: depending on the driver identification mode setting, defines either the badge number or the code used for identifying the driver to controllers.

- ***Options***
  - *Activity code*: if checked, the driver will have to enter an activity code before each transaction.
  – *NCE code*: if checked, the driver will have to enter a NCE code before each transaction.

Fuel transac.: Compact list of all fuel transactions associated with the selected driver, starting with the most recent.

Access tr.: Compact list of all access transactions associated with the selected driver. This tab is displayed only if at least one access is defined in controllers, and if they identify drivers. From here it is possible to expand this view and browse these records from the *Access transactions* page .

4.2.1 Department reassignment

When a fuel transaction is processed, the department of the driver is stored in the transaction record if the vehicle has no department. This way, when a driver department changes, existing transactions remain assigned to the previous department while future transactions will be assigned to the new department.

In practice, the driver department is not always changed at the exact time of its administrative transfer. Therefore, when a driver department is changed, the application will prompt to change the department in previous fuel transactions for that driver.

Possible actions:

- Re-assign all of the driver fuel transactions to the new department.
- Re-assign some of the driver fuel transactions to the new department given some time range.
- Don't change existing transactions.

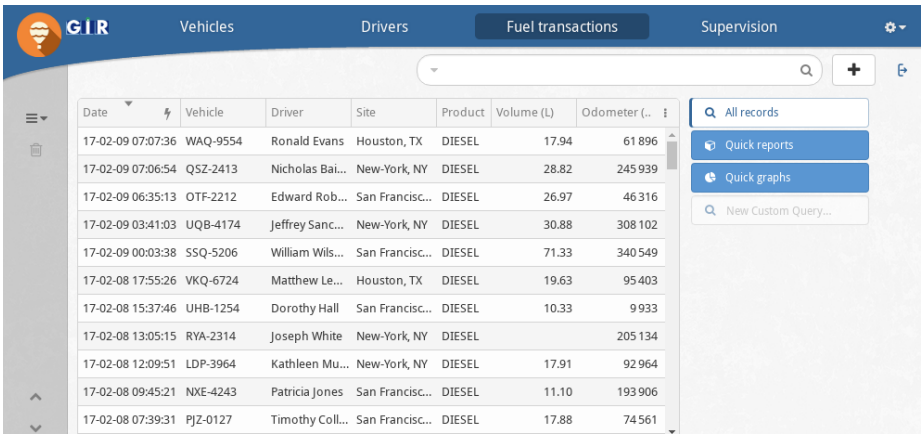
Chapter 5

Fuel transactions

Fuel transactions consist of data related to refueling visits at terminals. Fuel transactions can either be retrieved from controllers or entered manually into the GIR W150 web application.

5.1 Transactions list

The Fuel transactions page contains a list of all recorded fuel transactions, starting with the most recent. This list is automatically updated when the icon is displayed in the *Date* column header.



Date	Vehicle	Driver	Site	Product	Volume (L)	Odometer (..
17-02-09 07:07:36	WAQ-9554	Ronald Evans	Houston, TX	DIESEL	17.94	61 896
17-02-09 07:06:54	QSZ-2413	Nicholas Bai...	New-York, NY	DIESEL	28.82	245 939
17-02-09 06:35:13	OTF-2212	Edward Rob...	San Francisc...	DIESEL	26.97	46 316
17-02-09 03:41:03	UQB-4174	Jeffrey Sanc...	New-York, NY	DIESEL	30.88	308 102
17-02-09 00:03:38	SSQ-5206	William Wils...	San Francisc...	DIESEL	71.33	340 549
17-02-08 17:55:26	VKQ-6724	Matthew Le...	Houston, TX	DIESEL	19.63	95 403
17-02-08 15:37:46	UHB-1254	Dorothy Hall	San Francisc...	DIESEL	10.33	9 933
17-02-08 13:05:15	RYA-2314	Joseph White	New-York, NY	DIESEL		205 134
17-02-08 12:09:51	LDP-3964	Kathleen Mu...	New-York, NY	DIESEL	17.91	92 964
17-02-08 09:45:21	NXE-4243	Patricia Jones	San Francisc...	DIESEL	11.10	193 906
17-02-08 07:39:31	PJZ-0127	Timothy Coll...	San Francisc...	DIESEL	17.88	74 561

Transactions list columns that are displayed by default:

- ***Date***: date and time of the transaction from the instant the fuel pump is engaged. Recorded with one-second precision.
- ***Vehicle***: identified vehicle.
- ***Driver***: identified driver.
- ***Site***: site where the transaction took place.
- ***Product***: product distributed.

- ***Volume***: volume distributed.
- ***Odometer***: meter entered (may display hour meter instead).

Additional columns available:

- ***Pump***: pump number used on the controller to distribute the fuel product.
- ***Tank***: tank from which the fuel is pumped.
- ***Duration***: total time elapsed to complete the transaction.
- ***Department***: the vehicle department (at the time of the transaction), or the driver department if the vehicle has no department.
- ***Model***: the current model of the vehicle.
- ***Unit price***: unit price of the product (at the time of the transaction).
- ***Total price***: *Unit price* multiplied by the transaction *Volume*.
- ***Activity***: activity which code has been entered on the terminal.
- ***NCE code***: non-checked entry code entered on the terminal.
- ***Operator***: displays the operator badge or code used for identification. Only available when at least one operator is defined
- ***Odometer only***: meter entered.
- ***Meter only (h)***: meter entered.
- ***Covered***: distance covered since the previous transaction (and/or time in the case of hour metering).
- ***Cons.***: fuel consumption rate since the previous transaction in L/100km or mpg (and/or L/h or gal/h in the case of hour metering).
- ***Notes***: additional notes.
- ***Totalizer***: total volume counted by the pump.
- ***Ident. mode (Driver)***: identification mode used for driver identification.
- ***Ident. mode (Vehicle)***: identification mode used for vehicle identification.
- ***Unauthorized refueling***: the transaction was not authorized.
- ***Remote transaction***: the transaction was triggered from the supervision page.
- ***Modified***: the transaction was modified (*[*]* indicator).
- ***Created manually***: the transaction was created manually (*[M]* indicator).

- ***Type***: internal or external (*[E]* indicator).
- ***Meter was forced***: the meter entry was forced (*[F]* indicator).
- ***Max capacity reached***: the transaction stopped after reaching the maximum volume (*[Max]* indicator).
- ***End reason***: the cause of the transaction stop. Only set for pump modules starting from version 4.0.9. Possible values:
  - *Timeout*: the *timeout (before)* or *timeout (after)* pump parameter was reached
  - *Nozzle switch*: manual pump hang-up
  - *Max capacity reached*: the transaction reached its maximum volume authorized
  - *Max. duration*: the transaction reached its maximum duration
  - *Reboot*: the pump module power was lost
  - *C1/C2 error*: pump module counting error
  - *Triggered stop*: the transaction was stopped remotely
  - *Internal error*: pump module error

Transaction records may contain a special indicator next to one or more fields. These indicators are generally shown between brackets.

Possible indicators include:

- *[*]* in the *Product* field: the transaction was modified.
- *[M]* in the *Product* field: the transaction was created manually.
- *[E]* in the *Product* field: the transaction was made on an external station.
- ® in the *Product* field: the transaction was started remotely.
- *[F]* in the *Odometer* field: the meter entry was forced.
- *[O]* in the *Odometer* field (*Offline: no meter control*): the meter control was disabled because the controller was offline at the start of the transaction (only enabled for large applications).
- *[Max]* in the *Volume* field: the transaction stopped after reaching the maximum volume.
- *[Op. 1234]* in the *Vehicle* or *Driver* field: the 1234 operator badge or code was used to identify this vehicle or driver.
- *(1234)* in the *Vehicle* column: NCE code `1234` was entered. Note: only displayed in the *Vehicle* column if the *NCE code* column isn't visible.
- *(Activity)* in the *Vehicle* column: The code for this activity was entered. Note: only displayed in the *Vehicle* column if the *Activity* column isn't visible.

5.2 Manual transaction entry

Transactions can be entered manually. This generally occurs in one of two cases:

- Refuelings that took place outside of the stations managed by the application.
- Refuelings that were performed manually — for instance during a temporary terminal malfunction.

Click on the ✚ button in the Fuel transactions page to create a new manual transaction record.

You will be prompted for the following fields:

- ***Type***: transaction type.
  - *External*: refueling that was performed in a station that is not managed by the application.
  – *Internal*: manual refueling on a pump defined in the application that was not properly recorded.
- ***Date***: date and time of the refueling.
- ***Vehicle***: vehicle that made the refueling.
- ***Driver***: driver that made the refueling (when driver identification is enabled).
- ***Volume***: quantity of fuel distributed.
- ***Meter/NCE code***: additional information required depending of the vehicle configuration.

If you selected the *External* type, you will also be prompted for:

- ***Product***: the distributed product.
- ***Unit price***: the unit price of the product.

If you selected the *Internal* type, you will also be prompted for:

- ***Pump***: pump used for the transaction.

Once you've entered all the necessary information, the *Create* button allows you to store the record in the transaction history. The *Discard* button cancels the manual transaction creation and closes the editor.

5.3 Transaction modification

It is possible to modify a transaction after it has been recorded. Modifying transactions is useful in several cases:

- To correct an error in a manually-entered transaction.
- To correct a bad value entered into the controller (meter, NCE code, etc.).

- To reassign the transaction to another vehicle or driver, e.g. if a vehicle was mistakenly identified using the key of another vehicle.
- To correct the distributed volume, in case of pump malfunction.

Click on a transaction in the list to open the fuel transaction editor. A form with all editable transaction fields will be displayed. Note that not all fields always editable:

- For transactions retrieved from a controller, the date, site, product, pump and duration fields can not be modified.
- For transactions entered manually, any visible field can be modified.

The history of changes performed on a transaction (the audit trail) can be viewed by clicking the Info button in the action menu. Each line in this list corresponds to a modification by a user on this transaction.

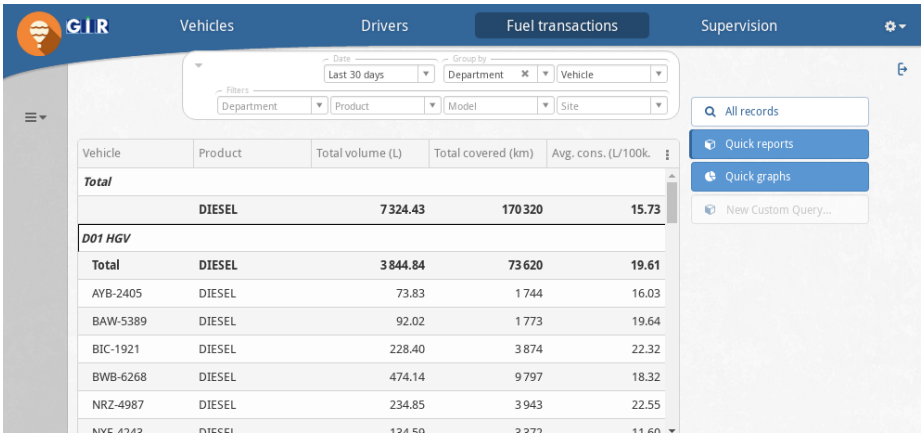
5.4 Transaction cancellation

Transaction cancellation is useful to remove manual entries created by mistake. Only manual transaction can be cancelled — transactions retrieved from the controller can not be cancelled.

Click on the delete button to cancel a transaction.

5.5 Quick reports

The easiest way to generate fuel transaction reports is to select the *Quick reports* view. By default, the sum of all fuel consumed for all vehicles/products for the last 30 days is shown.



The report content is defined by a small form at the top of the screen. The first row contains the following fields:

- ***Date***: the period during which transactions should be summed.

- ***Group by***: defines the categories over which transactions are totalled and sub-totalled. For instance, selecting *Department* and *Vehicle* as criteria will show the total fuel consumption of each vehicle during the selected period, grouped by department.

The second row contains various filters that can be used to restrict the report to a particular subset of transactions (such as a specific Department, Site, Product, etc.).

The result of the report is presented in a table with the following columns:

- ***Product***: fuel product concerned.
- ***Total volume***: sum of transaction volumes.
- ***Total covered (km or mi)***: sum of transaction distances covered.
- ***Avg. cons. (L/100k or mpg)***: average consumption, computed from the Total volume and Total covered. Note that the volume of New meter transactions (refer to the New meters section below) is ignored from this calculation. For this reason, the value shown may not correspond exactly with the values for the Total volume and Total covered in the same row.

If the hour meter is enabled there will be two additional columns visible: *Total covered (h)* and *Avg. cons. (L/h or L/mi)*. These and other columns can be hidden by accessing the columns menu ⋮ in the top-right corner of the list. This menu can also be used to enable the display of two additional columns: *Count* and *Price*.

Report totals are computed for each Group by category as well as a global total for all transactions matching the requested filter and Date period. Selecting a row in the reports table will display a button to the left of the reports form. Clicking this button will display a detailed list of the fuel transaction records used to calculate the totals in the selected reports table row.

The dropdown button ▾ to the left of the reports form switches to an *Advanced* view of the current report. This view allows for detailed customization of query parameters.

The action menu (☰▾) allows to perform the following operations:

- ***Print***: prints the report
- ***Download CSV***: exports the report in CSV and downloads it
- ***Download CSV (alt)***: exports the report in CSV in an alternative format and downloads it

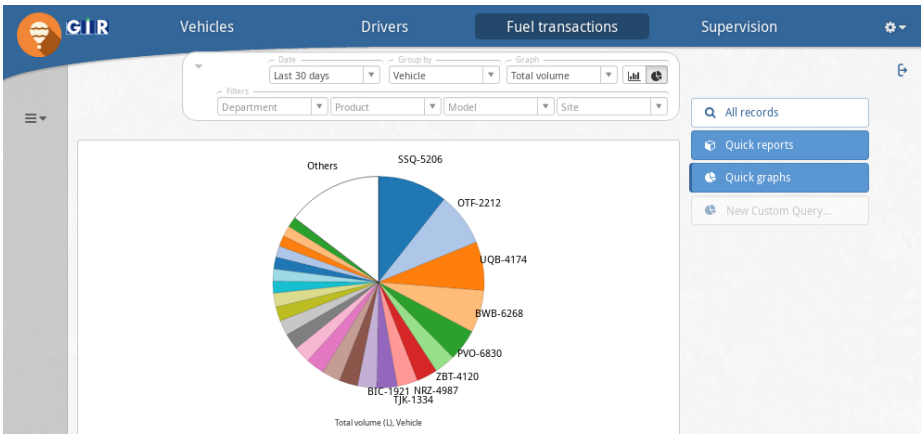
The report can also be stored by entering a name in the *New custom query...* field and clicking *Add (+)* in the Stored query panel on the right of the page.

5.6 Quick graphs

There are two types of graphs that can be produced in GIR W150 : histograms and pie charts.

The Quick graphs button is just below the Quick reports button. By default this will show a histogram of fuel consumption (total volume) by day for the last 30 days.





At the top of the screen is a form for changing the content of the graph. The first row contains the fields:

- ***Date***: the period during which transactions should be summed.
- ***Group by***: the categories over which transactions are totalled. For histograms, the possible values are units of time (per day, per week, per month or per year). For pie charts, possible values are transaction fields (Vehicle, Driver, Department, etc.).
- ***Graph***: the computed data that is shown on the graph (Total volume, Avg. price, etc.) as well as the graph type (histogram or pie chart).

The second row contains various filters that can be used to restrict the graph to a particular subset of transactions (such as a specific Department, Site, Product, etc.).

As with Quick reports, the bars in the histogram and slices of the pie charts can be selected to get a detailed view of all fuel transaction records contained therein. It is also possible to switch to an *Advanced* view, store the current graph or print it using the same controls as before.

5.7 New meters

Computing an accurate average consumption can be tricky. For instance, consider a new vehicle that was purchased with an initial odometer reading of 1234 km. It makes 3 transactions during its first month of service. Its transaction history would look like this:

Date	Volume (L)	Meter (km)	Covered (km)
29/06/07 08:15	109.00	1924	324
25/06/07 07:32	115.00	1600	366
22/06/07 14:20	150.00	1234	0

If these transactions were summed, a total volume of 374 L would be obtained along with a covered distance of 690 km. The average consumption would then be calculated as 54.2 L/100km. This results because the volume of the first transaction is not associated with any covered distance. In reality, the vehicle has only consumed 224 L in travelling 690 km. The real-world average consumption is 32.5 L/100km.

To address this situation, GIR W150 supports a *New meter* option for transactions. When a transaction record has this option enabled, its volume is ignored in average consumption calculations. The New meter option is automatically set for the first transaction of a vehicle.

Chapter 6

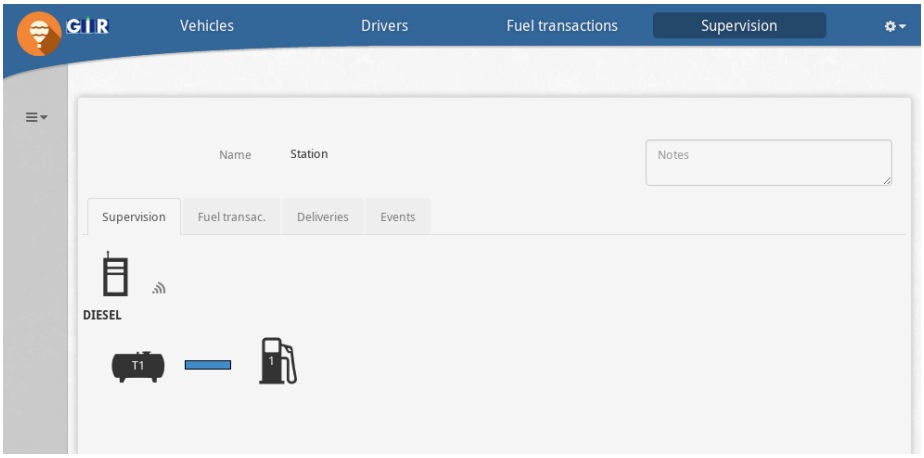
Supervision

The Supervision page provides a monitoring overview of controllers, tanks and pumps at each of the sites managed by the application. When there is only one site, the supervision window is shown full-screen. Otherwise, a list of sites is initially shown (on the left side of the page) along with a map (on the right side of the page) of site locations (using the GPS coordinates defined in the Settings).

All of the data presented on this page is automatically updated in real-time.

6.1 Supervision

The top of this tab lists all of the controllers defined for this site. Clicking the controller icon shows the controller editor (see: Settings). Next to the controller icon is the controller communication status (see: Controllers).



Below the list of controllers are the pumps assigned to this site, organized by tank.

The current volume of each tank is represented by a small graph with a blue bar representing the quantity of fuel remaining. If a gauge is defined for this tank, a second graph below the first one is added representing the real quantity

a fuel measured by the gauge. Additional tank information is found by clicking the tank icon :

- **Theoretical volume**: current volume / total volume (in liters)
- **Unit price**: current unit price of the fueling product in this tank
- **Gauge volume**: if a gauge is defined, then it's the value measured by the gauge. Clicking on this value opens a window with the details of the gauging data.

Clicking a pump icon  exposes two actions:

- ***Block*** / ***Unblock***: blocks or unblocks the pump. A blocked pump cannot be used by the controller. A pump may be automatically blocked by a controller to prevent inconsistencies in the event of a technical malfunction.
- ***+ transaction***: remotely initiates a transaction on the controller for this pump. Opens a new window where the vehicle, driver and meters can be specified. Once this form is submitted, a new transaction immediately begins on the controller and the pump can be used.

If something is wrong with a pump, its icon is colored in red. Clicking a pump icon will provide a message indicating the cause. Possible reasons:

- ***Link error***: communication error between the controller and the pump module
- ***Pump blocked***: the pump has been blocked either automatically by the system or manually through the supervision page
- ***Manual***: the pump is in manual mode

If there is another problem, a warning icon is displayed next to the controllers . Clicking the warning icons icon will provide a message indicating the cause. Possible reasons:

- ***Invalid date***: the controller date is incorrect
- ***Memory error***: the controller cannot store any transaction
- ***Memory full***: the controller memory is full
- ***Terminal error***: the terminal is not responding
- ***Reader error***: a reader is not responding
- ***Printer error***: a printer is not responding

If an access is defined on this site, it will be represented by an access icon . Clicking on that icon exposes one action:

- ***+ transaction***: remotely initiates a transaction on the controller for this access. Opens a new window where the vehicle and driver can be secified. Once this form is submitted, a new transaction immediately begins on the controller which activates the command relay.

6.2 Fuel transac.

Compact list of the most recent fuel transactions associated with this site, starting with the most recent. From here it is possible to expand this view and browse these records from the *Fuel transactions* page or to manually create a transaction record for this site .

6.3 Access tr.

This tab is only visible if a access is configured on at least one controller. It contains a compact list of the most recent access transactions associated with this site, starting with the most recent. From here it is possible to expand this view and browse these records from the *Access transactions* page.

Access transaction fields:

- ***Date***: date and time of the access transaction.
- ***Access***: access name.
- ***Vehicle***: vehicle identified.
- ***Driver***: driver identified.
- ***Status***: Possible values:
  - *Granted*: the relay was commanded after a successful identification
  - *Denied*: the identified vehicle or driver was not authorized for this access point
  - *Button*: the relay was commanded because the push button was pressed (only for *MR-Access* modules)
  - *A/M – Manual*: the relay switch was set to manual mode (only for *MR-Access* modules)
  - *A/M – Auto*: the relay switch went back to auto mode (only for *MR-Access* modules)

6.4 Manual Deliveries

A manual delivery is a record of a fuel product being resupplied to a tank. This tab is only visible if the *Manual Deliveries* option has been enabled in a tank. It shows the fuel manual deliveries for this site, starting with the most recent. This list of fuel manual deliveries is filtered by tank, so by default only the manual deliveries for the first tank (*T1*) are displayed. To visualize the manual deliveries for one tank, click on its name (*T1*, *T2* or *T3*...) to select the corresponding tank.

Manual Delivery fields:

- ***Date***: date and time of the manual delivery.
- ***Tank***: tank that was resupplied.

- ***Product***: delivered product.
- ***Volume***: volume delivered.
- ***Unit price***: unit price of the delivered product (only available if the *Unit. price* option has been enabled for this tank).

New fuel manual delivery records can be created by clicking the button and then completing the corresponding form. Once submitted, the tank current volume and unit price will be updated accordingly.

The tank volume and unit price before and after the manual delivery can be found in the "Before delivery" and "After delivery" tabs. Those values can be invalidated if the current or a previous manual delivery is modified or deleted.

When creating a manual delivery, the unit price of the tank product will be automatically updated based on the unit price of the remaining product (before delivery) and that of the product delivered, weighted by volume. The exact formula is as follows:

new price = ($P_s * V_s + P_t * V_t$) / ($V_s + V_t$)

with :

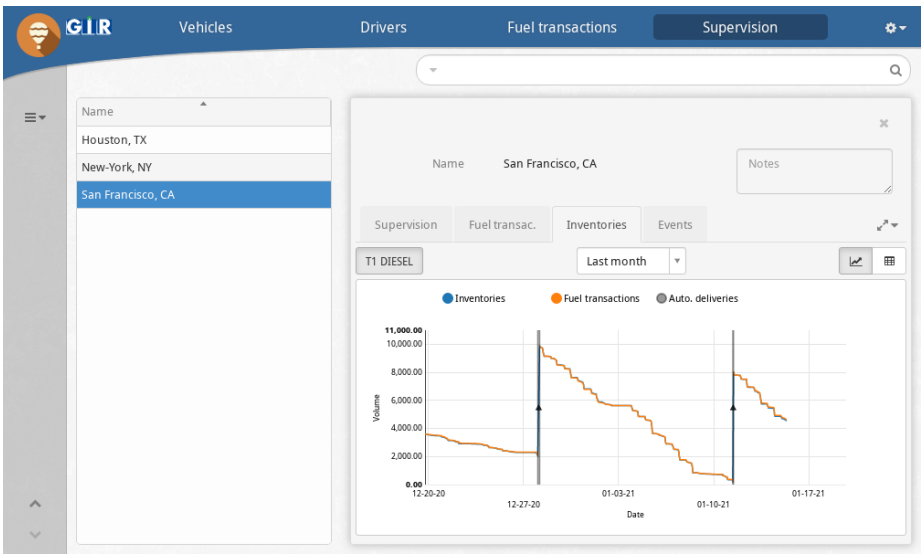
- P_t : remaining tank stock unit price
- V_t : remaining tank stock volume before the manual delivery
- P_s : manual delivery unit price
- V_s : delivered volume

Prices can also be set to automatic deliveries, generated from gauges (see below).

6.5 Inventories

This tab is only visible if a gauge is configured for at least one tank. It shows a chart with the history of a tank stock on the selected time range. This chart shows three different items:

- In blue, the history of inventories, which shows the evolution of the tank fuel stock, as measured by the gauge.
- In orange, the evolution of the tank fuel stock computed from fuel transactions volumes, as measured by pumps. This graph is only visible after the first automatic delivery.
- In gray, automatic deliveries, which are significant variations of the volume measured by the gauge, after taking into account fuel transactions. A positive variation generally means that a delivery was made. A negative variation generally means that fuel was taken from the tank without having been stored in fuel transactions. See below for more detail.



6.5.1 Auto. Deliveries

When a tank has both pumps and gauges, there are two independent channels for counting fuel:

- on one hand, pumps measure the volume that goes out of the tank, which is stored in fuel transactions.
- on the other hand, gauges measure the volume in the tank, which is stored in inventories.

By comparing those two measures, GIR W150 can detect fuel stock variations that are not caused by transactions, and show them as "Auto. Deliveries" (automatic deliveries).

Detected automatic deliveries are visible:

- on the chart, as gray areas with a ▲ triangle icon at their center. Details for an automatic delivery can be displayed by clicking on the triangle icon.
- in a scrollable list, toggled from the chart view with the icon at the right top of the chart.
- in a dedicated *Auto. Deliveries* menu within the dropdown menu at the right of the *Inventories* tab.

An automatic delivery has the following properties:

- ***Start***, ***End*** : Time range when the volume variation was detected. Depending on inventories frequency, this range can vary between a few minutes and a whole day.
- ***Tank***: Tank on which the automatic delivery was detected.

- ***Product***: Tank product.
- ***Notes***: Text field for additional comments.
- ***Volume*** : Delivery volume: the amount of fuel delivered into (or removed from) the tank. It can be formally expressed as "Gauge_at_end – Gauge_at_start + Concurrent_transactions", with:
  - *Gauge_at_end* : volume measured by the gauge at the end of the delivery.
  - *Gauge_at_start* : volume measured by the gauge at the start of the delivery.
  - *Concurrent_transactions* : total volume of fuel transactions made during the delivery.

A positive volume is an increase of the tank stock, typically indicating a delivery. A negative volume is a decrease of the tank stock, which was not stored in fuel transactions.

- ***Drift*** : Starting from the second automatic delivery, a *Drift* value is computed. It is the difference between volumes measured by the gauge since the previous delivery, and the total volume of fuel transactions made during the same time range. The drift indicates the relative error between fuel volumes measured by pumps and fuel volumes measured by gauges. In other words, the relative error between blue and orange curves. The drift depends on the precision of the hardware used for counting, and can be useful to verify that pumps and gauges are correctly configured. In parenthesis, a percentage value named *Drift ratio* compares the *Drift* value with the total transactions volumes since the previous automatic delivery.

The system also shows computed tank stock volumes before and after the delivery. From a stock accounting perspective, we must always have:
Volume (After) = Volume (Current) + Volume (Before)
with:

- ***Volume (After)***: Tank stock after the delivery. This is the volume as reported by the gauge at the end of the delivery.
- ***Volume (Current)***: Delivery volume, see ***Volume*** just above.
- ***Volume (Before)***: Tank stock "before" the delivery. When no transaction occurred during the delivery, this is the volume as reported by the gauge at the start of the delivery. When transactions did occur during the delivery, to preserve the stock accounting equality above, the system considers all these transactions to have occurred, by convention, "just before" the delivery. Therefore, *Volume (Before)* is computed as "Gauge_at_start – Concurrent_transactions".

The good detection of automatic deliveries depends on how reliable the measures are, in both gauges and pumps. Especially, when a vehicle refueling occurs at the same time an inventory is measured, the fluctuations caused by the pump can cause a loss of precision in the gauge measures. Even when the hardware works as expected and is correctly configured, some inventories can be approximate. When the system detects that an inventory has been made at the same time as a fuel transaction, the symbol ≈ is shown before the automatic delivery volume, to indicate it may be unreliable.

Automatic deliveries are detected automatically by the GIR W150 server when enough data is received, and when all controllers related to a tank (through pumps or gauges) are synchronized. When new deliveries are detected, a alert is shown in the alert panel, and a email is sent to users that have enabled the *Tank stock* notification.

6.5.2 Auto. Deliveries unit price

As a full replacement for manual deliveries, automatic deliveries can be assigned prices, which are then used to compute unit prices for tank stocks and fuel transactions.

Prices for automatic deliveries are enabled by the *Unit price* option in the tank settings. They require *Manual deliveries* on this tank to be disabled: if both manual deliveries and prices are enabled on a tank, prices are then managed in manual deliveries, not automatic ones.

Prices can only be defined for automatic deliveries with a positive volume. Negative deliveries are supposed to leave the tank stock price unchanged, and as such can't be assigned prices. In all this section about prices, "automatic delivery" is to be understood as "priceable automatic delivery", i.e. a positive delivery.

When prices are enabled, additional fields are available in the automatic delivery editor:

- ***Unit. price (Before)***: the tank stock unit price before the delivery. It is always read-only, but can be recomputed when needed.
- ***Unit. price (Current)***: the delivery unit price.
- ***Unit. price (After)***: the tank stock unit price after the delivery. It is automatically computed from the other values, and can also be specified manually.

On the inventory graph, the automatic delivery  triangle icon is red for deliveries with no price defined.
When the most recent automatic deliveries for a given tank have no price, an alert is also shown in the alert panel: "Auto. delivery without a price".

Overall, the system is designed to:

- Allow prices to be automatically computed when they are entered chronologically. This is the simplest and recommended use: just start from the first delivery for which you know the price, set it, and then just enter

Unit. price (Current) chronologically as new deliveries arrive, and let the system compute *Unit. price (After)*.

- Allow the user to override the default computation and define a custom *Unit. price (After)* at each step.
- Automatically propagate prices to fuel transactions, but never further than the "next segment". In other words, when an automatic delivery gets a *Unit. price (After)* value, this price is set to all fuel transactions between the current delivery and the next delivery. When the current delivery is the last one, the unit price is also set to the tank stock itself, which is then used by new fuel transactions.
- For each delivery, show a custom price icon when *Unit. price (After)* has been customized by the user. Clicking the icon recomputes the after price based on before and current prices and volumes.
- Allow prices to remain optional when unknown: if no price is set on a given delivery, the tank stock just keeps its existing price, and a price can still be set on the next one.
- Allow past prices to be modified, for instance to fix input errors. Whenever this is done, the previous rule regarding the "next segment" of fuel transactions still applies:
  - prices are then changed in all fuel transactions between the current delivery and the next one.
  - a  warning icon is shown near *Unit. price (Before)* in the next delivery, indicating that past prices have been changed. Clicking it shows a *Recompute* button which allows to update the current delivery prices, and propagate the price change further. In terms of tanks stocks prices and fuel transactions pricing, changing prices in past deliveries and manually propagating them gives the exact same values as if these prices had been initially entered.

6.5.3 Auto. Deliveries unit price – extra detail

In detail, the capabilities described in the previous section are achieved through the following rules and UI elements on the automatic deliveries price fields:

- *Unit. price (Before)* can be:
  - *Unknown* in gray if this is the first priceable automatic delivery of the tank, and no stock price has been defined in the tank yet.
  - *Unknown* in red if there are deliveries with prices before the current one, but the previous delivery doesn't have a price. Clicking on *Unknown* selects the previous delivery, allowing to enter prices chronologically. If some prices are not known, or if one doesn't wish to go back too far in the past, it is also possible to leave *Unit. price (Before)* as *Unknown* and to just manually enter *Unit. price (After)*.

  - A numeric value with no icon: *Unit. price (Before)* in the current delivery is then the same value as *Unit. price (After)* in the previous delivery.
  - A numeric value with a ⚠ warning icon: This indicates that prices were retroactively changed in the previous delivery, so *Unit. price (Before)* in the current delivery is no longer the same as *Unit. price (After)* in the previous delivery. *Unit. price (Before)* can then be updated with the *Recompute* button to propagate the price change.

- *Unit. price (Current)* can be:
  - Empty when no price has been defined yet
  - A numeric value when a price has been defined

- *Unit. price (After)* can be:
  - Empty when no price has been defined yet
  - A numeric value with no icon when the after price was automatically computed by the system from the before and current price and volume values.
    This computation is just an average of the existing tank stock price and the current delivery price, weighted by volume. The exact formula is as follows:
    Unit. price (After) = ($P_s * V_s + P_t * V_t$) / ($V_s + V_t$)
    with :
    * P_t : *Unit. price (Before)*
    * V_t : *Volume (Before)*
    * P_s : *Unit. price (Current)*
    * V_s : *Volume (Current)*
  - A numeric value with a ↻ custom price icon when the after price was set manually by the user. When the before price is not unknown, clicking this icon recomputes the after price using the default formula.

Whenever *Unit. price (After)* changes, it is assigned:

- to all fuel transactions until the next delivery. A transaction is considered as being between two deliveries D1 and D2 when the transaction start date is between D1 end date and D2 end date. Any price change performed after the first assignment shows a confirmation prompt indicating how many transactions will be impacted by the operation.

- to the tank stock if this was the last delivery for this tank

6.5.4 Auto. Deliveries – false positives

When the gauged volume values is imprecise or sometimes false, it is possible that auto. deliveries get incorrectly detected by the system. In this case, it is possible to mark the auto. delivery as a false positive by using the 🗑 deletion

button. Marking an auto. delivery as false positive ignores this volume variation, and updates the *Drift* value of the following delivery if it exists. When deliveries unit. price is enabled, this action is only possible when no price has been assigned on the delivery yet.

False positive deliveries are not displayed in the *Inventory* graph, but can be found in the *Auto. deliveries* page. Those records are masked by default, but can be displayed when filtering the collection with the *False positive* field. Those deliveries have an additional *False positive* checkbox which is the only field that can be edited. This field allows to cancel the false positive marking for this delivery.

6.5.5 Inventories data

The ⤢ dropdown menu at the right of the *Inventories* tab allows to access the list of stored gauge inventories.
Each inventory contains the following fields:

- ***Date*** : Date and time when the inventory was measured.
- ***Tank*** : Tank associated to this inventory.
- ***Volume***: Volume of fuel measured.
- ***Temperature***: Temperature measured.
- ***Type***: What caused the inventory:
  - *Scheduled*: an inventory is scheduled daily at midnight for all gauges. It is only stored if the controller is powered on at that time.
  - *Transaction*: an inventory is stored after each fuel transaction.
  - *Supervision*: stored when the supervision page is accessed, and the volume measured changed significantly.
  - *Auto*: stored automatically by the controller when gauged volume changed significantly.
- ***Gauge readings***: Technical detail of gauge readings for each gauge of this tank. A click on a line shows a pop-up with the reading details. The ⤢ button allows to access the gauge readings list. See *Gauge readings* below.

6.5.6 Gauge readings

The gauge readings list is available with the ⤢ button in the details of an inventory. It contains technical information returned by gauges, mostly useful for troubleshooting purpose:

- ***Date*** : Date and time when the gauge reading was made.
- ***Tank*** : Tank associated to this reading.
- ***Result***: Gauge reading result. Possible values:

  - *OK*: Successful reading.
  - *Link error*: The gauge module was not detected.
  - *Error (Timeout)*: The gauge device didn't respond.
  - *Error (Invalid response)*: The gauge device response couldn't be interpreted.
  - *Probe error*: The gauge device returned an error in response (see *Vendor error code*).

- ***Vendor error code***: Error code returned by the gauge device.
- ***Volume*** : Volume of fuel measured by the gauge.
- ***Height*** : Height of fuel measured by the gauge.
- ***Water volume*** : Volume of water measured by the gauge
- ***Water height*** : Height of water measured by the gauge.
- ***Temperature*** : Temperature measured.
- ***Duration*** : Duration of the measure.
- ***Probe*** : Name of the gauge.
- ***Inventory*** : Link to the inventory for this reading.
- ***Version***, ***Offset*** : additional technical data returned by the gauge (Hectronic gauges only)

6.6 Events

The event history is a general-purpose list of various status changes and notifications generated by either a specific controller or the GIR W150 server. The event history is accessible from the main dropdown menu . It can also be accessed on the Supervision page under the details for a particular site, in which case only events for that site are displayed and the list is updated automatically.

Event fields:

- ***Date***: date and time of the event.
- ***Site***: the site where the event occurred.
- ***Category***: event category.
- ***Type***: event type.
- ***Pump***: the pump concerned by the event (if applicable).
- ***Content***: the event details. May vary depending on the event type.
- ***Vehicle***: the vehicle concerned by the event (if applicable).
- ***Driver***: the driver concerned by the event (if applicable).

- ***Badge***: the badge stored in the event (if applicable).
- ***Code***: the code stored in the event (if applicable).
- ***Ident. mode***: the identification mode stored in the event (if applicable).

Event categories as well as the specific event types are organized as follows:

- ***Communication***: controller communication related events.
  - *Pairing...*: a pairing was started on a controller.
  – *Pairing succeeded*: a pairing was completed.
  – *Pairing failed*: a pairing failed after some time.
  – *Pairing cancelled*: a pairing was cancelled by a user.
  – *Unpairing*: a controller was unpaired manually by a user.
  – *Unpairing (error)*: a controller was unpaired automatically (after a synchronization error, for example).
  – *Reboot*: a controller was rebooted.
  – *Offline*: a controller went offline.
  – *Online*: a controller went back online.
  – *Upgrade...*: a controller upgrade request was sent.
  – *Upgrade succeeded*: a controller upgrade was completed.
  – *Upgrade failed*: a controller upgrade failed after some time.
  – *Restart*: a controller was restarted.
- ***Identification***: identification on controllers related events.
  – *Unknown identification*: unknown code or badge.
  – *Denied identification*: known badge but used in an invalid context.
- ***Pumps***: pumps related events.
  – *Blocked*: a pump was blocked either by the controller or from the supervision page.
  – *Unblocked*: a pump was unblocked either by the controller or from the supervision page.
  – *Manual*: : a pump was switched to manual mode.
  – *Auto*: a pump was switched back to automatic mode.

6.7 Tanks

The *Tanks* page allows to display and update all the tanks in the application. It is possible to access to this page from the *Supervision* page, by clicking on the action menu (), then by selecting the *Tanks* element in the dropdown menu.

Columns displayed by default:

- ***Site***: Site name.
- ***Number***: Tank number.
- ***Product***: Tank product.
- ***Unit price***: Current tank unit price.
- ***Capacity***: Tank capacity.

- ***Theoretical volume***: Current tank theoretical volume.
- ***Gauge volume***: Last gauged volume.
- ***Gauge date***: Last gauged volume date

6.7.1 Past stocks

This report can be accessed from the *Tanks* page, by selecting the *Past stocks* element in the saved queries panel.

This report allows to compute an estimation of the past stock value of tanks, at a selected date. This estimation is fixed in time, as long as the data related to deliveries and transactions on the period between the selected date and now are unchanged.

The content of the report is determined by the form at the top of the screen, containing the following fields:

- ***Date***: date used for the past stock estimation. The stock will be computed for the selected date at midnight (00:00).
- ***Site***: allows to filter by site or region.
- ***Product***: allows to filter by product.
- ***Type***: allows to filter by stock management type (automatic or manual).

The report result is presented in the form of a table with the following columns:

- ***Tank***: Tank name. If the *[M]* tag is present, this line is about manual stock management. Otherwise, it is about auto stock management. If a tank has both auto and manual stock management, then two lines will be added to the report, one for each stock management type.
- ***Past stock***: Tank stock computed at the selected date at midnight (00:00).
- ***Fuel transactions***: Sum of fuel transactions volumes from the selected date up to now.
- ***Deliveries***: Sum of deliveries volumes from the selected date up to now. For auto stock management, then it's auto. deliveries. For manual stock management, it's manual deliveries.
- ***Drift***: Cumulative error in reconciliations between gauges and fuel transactions between the selected date up to now. Only present for automatic stock management.
- ***Current stock***: Current theoretical or gauged stock.

The calculation of the past stock is different depending the stock management type. For manual stock management, the past stock is computed from current stock, fuel transactions, and deliveries. For any past date, the system

guarantees that:
Past stock – Fuel transactions + Deliveries = Current stock

For automatic stock management, a past stock is obtained from the nearest tank inventory after the selected date. The stock at exactly midnight is then computed from fuel transactions and auto. deliveries. For any past date, the system guarantees that:
Past stock – Fuel transactions + Deliveries + Drift = Current stock

The action menu () allows to perform the following operations:

- ***Print***: prints the report
- ***Download CSV***: exports the report in CSV format and downloads it
- ***Download CSV (alt)***: exports the report in CSV in an alternative format and downloads it

6.7.2 Future stocks

This report can be accessed from the *Tanks* page, by selecting the *Future stocks* element in the saved queries panel.

This report allows to compute an approximation of the future stocks evolution for each tanks. The calculation of this approximation is done by computing average fuel consumption over a given interval.

The content of the report is determined by the form at the top of the screen, containing the following fields:

- ***Sample***: sampling period used to calculate consumption averages.
- ***Site***: allows to filter by site or region.
- ***Product***: allows to filter by product.
- ***Type***: allows to filter by stock management type (automatic or manual).

It is important to select a right sampling period to get reliable estimates. Selecting a too short sampling period or for period of abnormal activity may bias the results.

The report result is presented in the form of a table with the following columns:

- ***Tank***: Tank name. If the *[M]* tag is present, this line is about manual stock management. Otherwise, it is about auto stock management. If a tank has both auto and manual stock management, then two lines will be added to the report, one for each stock management type.
- ***Capacity***: Tank capacity.
- ***Current stock***: Current theoretical or gauged stock.
- ***Alert threshold***: Tank alert threshold.
- ***Days before alert***: estimation of the number of days before the tank volume drops below the alert threshold.

- ***Block threshold***: Tank block threshold.
- ***Days before blocking***: estimation of the number of days before the tank volume drops below the block threshold.
- ***Days before zero***: estimation of the number of days before the tank is completely empty.

By clicking on one of the report lines, it displays a graph simulating the future stock evolution of the selected tank.

The ⋮ menu at the table top right corner can be used to display or hide some columns.

The action menu (☰▾) allows to perform the following operations:

- ***Print***: prints the report
- ***Download CSV***: exports the report in CSV format and downloads it
- ***Download CSV (alt)***: exports the report in CSV in an alternative format and downloads it

Chapter 7

Controllers

Controllers are autonomous: they can operate without a permanent link to the GIR W150 server. To this effect, each controller stores its own local copy of the database, with the list of authorized vehicles and drivers. When a transaction is made, it is stored in the controller memory, waiting to be retrieved by the GIR W150 server.

Connecting a new controller to the GIR W150 server is called a pairing. Each controller has its own unique serial number — the pairing associates the GIR W150 server with the controller using the unique serial number. Once controllers are paired, they are able to communicate with the server.

The sending of drivers and vehicles and the retrieval of fuel transactions is called a "synchronization" in GIR W150 and is part of the regular communication process between the server and the controllers. The synchronization is done automatically once a controller is paired and online.

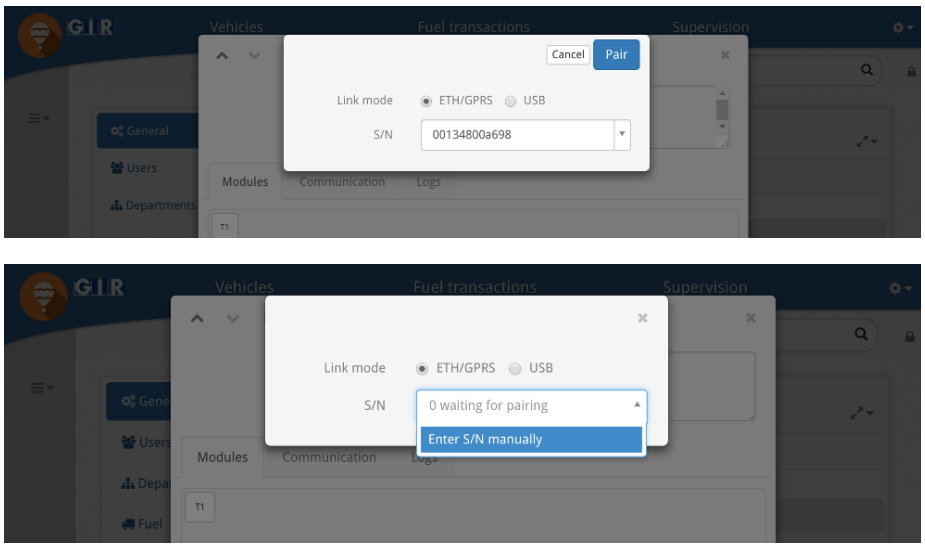
7.1 Pairing

The pairing functionality is accessible from the controller editor through the *S/N* field (the controller editor itself is accessed through the Settings page — see: Settings / Sites). When a controller is paired, its serial number is displayed in this field. The icon next to this field indicates the controller pairing status:

- : either not paired (empty S/N) or pairing in progress (non-empty S/N).
- : paired.
- : unpaired automatically (icon appears in red).

7.1.1 Start a pairing

To pair a controller, first create a new controller under a Site in the Settings / General / Sites tab. Next, click the icon. A new window is displayed:



This window first invites you to select a *link mode*. This parameter defines how the controller communicates with the GIR W150 server, and two options are available:

- ***ETH/GPRS***: online communication through Ethernet or GPRS
- ***USB***: offline communication through files exchanged on USB devices

This window also supports input of a serial number. If the controller is already configured to communicate in *ETH/GPRS* with the GIR W150 server, the S/N selection box will display *1 waiting for pairing* and the controller serial number it will already be available. In that case, simply select it and click *Pair* to begin the pairing process.

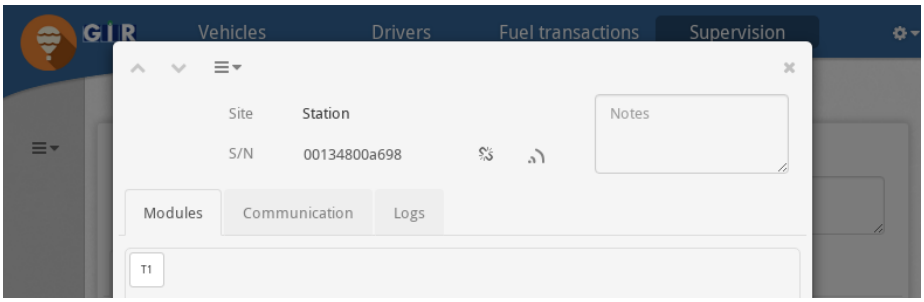
Otherwise, if the controller is not already configured to communicate with the server, select the option *Enter S/N manually* from the S/N selection box. This will change the selection box into a free-form text field. Manually enter the controller serial number and click *Pair*. The pairing process will then wait for the controller to connect before starting the installation.

If the *USB* link mode is set, you also have to enter the controller serial number manually. For more information, please refer to the USB communication section below.

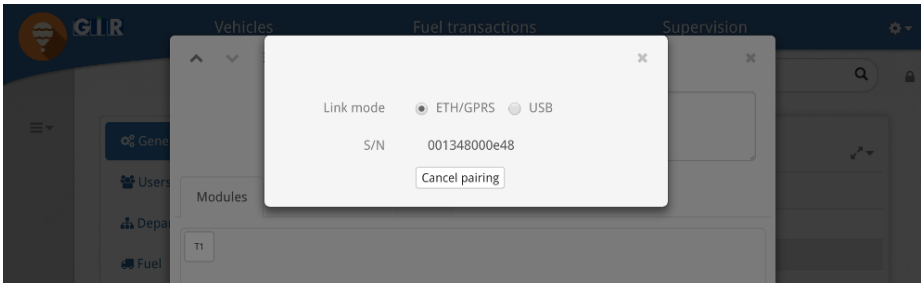
Pairing process in *ETH/GPRS* link mode:

1. Wait for the controller to connect
2. Install new firmware if needed
3. Restart the controller
4. Configure the application
5. Send the drivers & vehicles list

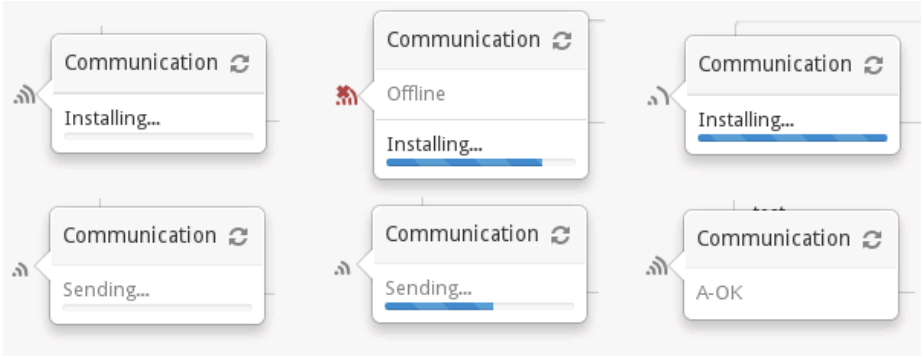
Once pairing has started in *ETH/GPRS* link mode, the controller editor will display the following:



Pairing can be cancelled by clicking .

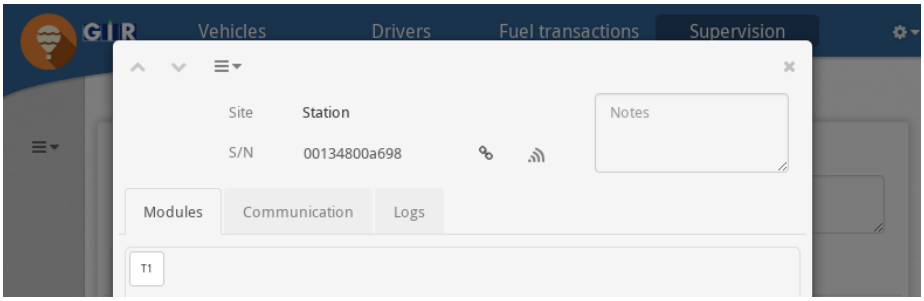


In *ETH/GPRS* link mode, the progression of the pairing process can be seen by clicking (refer to the *Communication* section below).



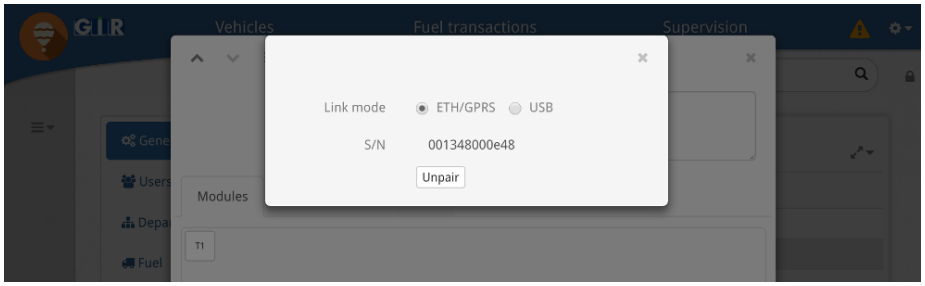
7.1.2 Paired state

After pairing has completed, the controller editor will display:



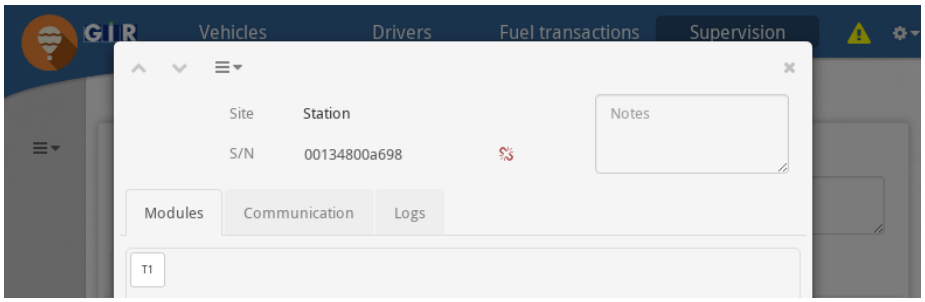
A controller can be unpaired by clicking .

Unpairing a controller is a dangerous operation that can result in data loss. It should only be done when you are certain that all transactions have been synchronized to the GIR W150 server. If you unpair a controller that has not completely synchronized, all transactions not yet retrieved can be lost.

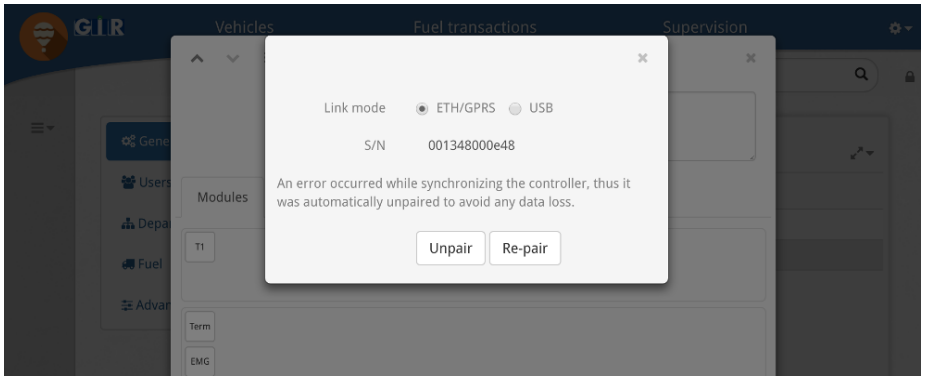


7.1.3 Automatically unpaired state

In the event of synchronization error, it is possible that a controller is unpaired automatically by the GIR W150 server in order to prevent inconsistencies or data loss. In this case, the following will be visible in the controller editor:



You'll find more details and possible actions if you click on the icon.



Actions:

- ***Unpair***: completely unpairs the controller with this serial number. The controller will then be in an uninitialized state and it will be possible to pair it with another serial number.

- ***Re-pair***: initiates a new pairing with the serial number. In that case, it will reset all the controller data and send again all the vehicles and drivers.

7.2 Communication

The communication state indicator is an icon that provides a quick overview of the status of the communication between a controller and the GIR W150 server. It is found in the controller editor to the right of the *S/N* field. Clicking this icon displays the communication window pop-up with details of the current state.

Communication state:

- (no icon): the controller is not yet paired.

- : *Offline* – the controller is offline.

- : *Unknown* – the controller may be offline.

- : *Loading* – the controller is currently pairing or upgrading its firmware (the icon is animated).

- : *Not synchronized* – the controller is synchronizing some data (the icon is animated).

- : *A-OK* – synchronized and operating normally. Nothing to report.

- : *Invalid pairing* – the controller is connected but cannot communicate with the server due to a pairing problem.

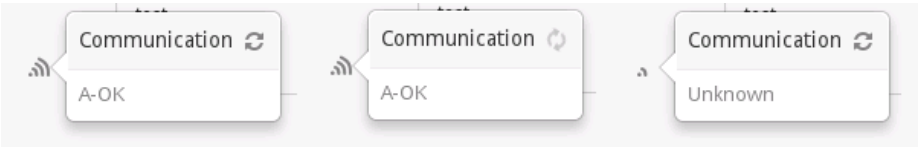
- *USB communication* – the controller communicates with files using USB devices. See the USB communication section below.

7.2.1 Ping

The synchronization process between controllers and the GIR W150 server is optimized such that messages are not continuously exchanged when there is no data needing to be sent. It is possible to immediately verify the controller connection and refresh the communication state by sending a *Ping*, accessed from the communication window pop-up (only available in *ETH/GPRS* link mode).

Clicking will send a Ping to the controller. The icon will spin while the Ping is being sent. If the Ping succeeds, the communication state indicator should return to the *A-OK* state.

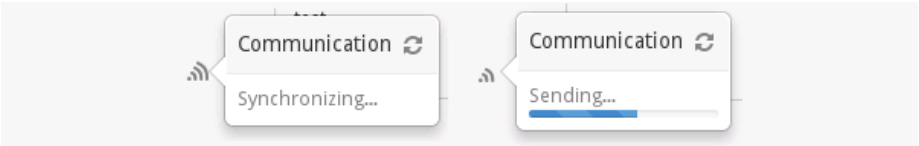
After 10 seconds we still haven't received the controller response, the ping fails and it switches to the *Unknown* state.



7.2.2 Synchronization

When in *ETH/GPRS* link mode and data has been changed by the GIR W150 server (such as a new vehicle added) or if the controller has transactions to send, then the controller enters the *Not synchronized* communication state. Clicking will show details in the communication window pop-up.

If there are fewer than 5 records needing to be synchronized, the communication window pop-up will display the message *Synchronizing...*. Otherwise, it will display the message *Sending...* or *Receiving...* along with a progress bar tracking the synchronization process.



7.2.3 Diagnostic tools

Diagnostic is an action available in the *Communication* tab of the controller editor. It allows to analyze what's going on a controller when it doesn't work as expected. The *Diagnostic* action requires kvgca 2.0.27 or above.

Clicking on this action opens a new window. If the controller is online, a form will be displayed containing three sliders:

- ***Modules test***: defines whether to test and report module statuses. Possible values are:
  - *None*: don't display module statuses.
  - *Soft*: displays current module statuses. This is a read-only operation which doesn't interrupt any controller operation, and may report cached information.
  - *Hard*: force a full modules refresh before displaying statuses. This operation is longer than *Soft*: it ensures that all module statuses are refreshed before reporting them. If a user prompt is in progress, it will be reset. Fuel transactions in progress are not impacted and can continue normally.
- ***Prompt logs***: this log contains interactions between the controller and the users. It displays data entered by users on the terminal keyboard, and badges used for identification. It also shows what was displayed on the terminal screen. If different than *None*, the slider defines how much data should be fetched from the controller (more data takes longer to retrieve).

- ***Devices logs***: this log contains all the technical data exchanged between the controller and devices on serial links. If different than *None*, the slider defines how much data should be fetched from the controller (more data takes longer to retrieve).

Below the form, or instead it if the controller is offline, a *Last operations* table allows to review the last diagnostic operations done on this controller. The *Show* button displays the results for this previous operation.

7.2.4 Other actions

The following actions are also available in the controller *Communication* tab:

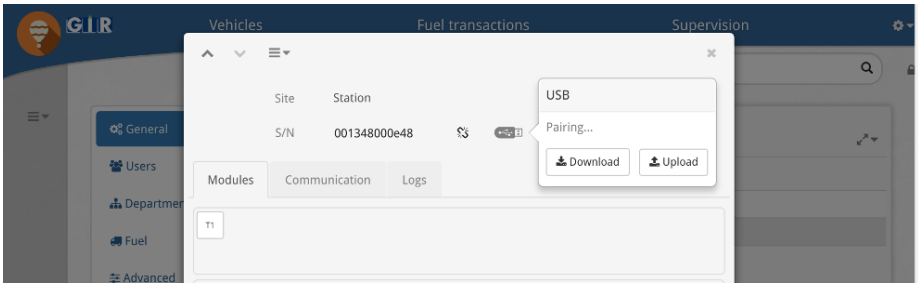
- ***Upgrade***: available if the controller is online and if its version is not up to date. It upgrades the controller to the latest version. Controller operation continues normally during almost all the upgrade operation, while transferring the new firmware file: only a small interruption occurs when the controller restarts on the new firmware. Fuel transactions in progress continue normally during and after an upgrade.
- ***Reboot***: available if the controller is online. This forces a full software system reboot on the controller. Fuel transactions in progress continue normally during a controller reboot, as long as pump modules are powered on.

7.3 USB Communication

If the *USB* link mode is selected during the pairing, the controller will communicate with the GIR W150 server through files on a USB device.

7.3.1 Pairing

Select *USB* link mode in the pairing window, enter your controller serial number and click “Pair”. The USB communication window pop-up will then show up and display *Pairing...* alongside two buttons: *Download* and *Upload*.



To complete the pairing, you’ll have to:

1. *Download* the synchronization file
2. Put the file on a USB device.

3. Insert the USB device in one of the controller's USB ports.
4. Follow the instructions on the terminal.
5. *Upload* the file created by the controller on the USB device.

Once the first *upload* is done, the USB communication window pop-up will display *Last synchronization:* and the date when the upload was done.

7.3.2 Communication

On *USB* link mode, the communication state indicator is replaced by an USB device icon: . A click on this icon displays the USB communication window pop-up which contains the following elements:

- ***Last synchronization***: the date of the last upload for this controller.
- ***Download***: button that generates and download a USB synchronization file to send the controller.
- ***Upload***: button that sends a USB synchronization file from the controller to the GIR W150 server. It is also possible to drag & drop the file directly into the window pop-up to trigger an upload.

A click on *Download* generates a file containing the GIR W150 server data in order to send it to the controller. The file should be named `gir-usbsync-<S/N>-server_to_vatersay.` (where `<S/N>` is the controller serial number). Copy this file directly to the root directory of a USB device, and then insert this USB device to one of the controller's USB ports. The USB device will then be automatically detected and the terminal will display:

```
PRESS 9 FOR USB SYNC
```

Press the `9` key to start the USB synchronization scenario. Press `Cancel` to return to the controller's idle state.

```
26/01/2018 10:28
DATE OK?
```

Press the `Validate` key to confirm that the date displayed is correct. If the date is not correct, press the `Cancel` key and enter the correct date. Once the date is validated, the USB synchronization will start:

```
USB SYNC 0.0%
PLEASE WAIT
```

This operation can take several minutes.

```
USB SYNC 100.0%
PLEASE WAIT
```

Once the following message is displayed, it is safe to remove the USB device:

```
USB SYNC OK
PLEASE REMOVE DEVICE
```

The controller will then reload its configuration with the new server data and then return to the idle state. During the USB synchronization scenario, the controller generates a file on the USB device (in its root directory). The file should be named `gir-usbsync-<S/N>-vatersay_to_server.dat`. This file contains the controller transactions to send to the GIR W150 server. This is the file that should be selected when the *Upload* button is clicked.

Once the upload is completed, the transactions are added to the application. A *+<N> Fuel transactions* notification is displayed (<N> is the number of transactions fetched from the controller), and the *Last synchronization* date is updated.

7.3.3 Special cases

During the USB synchronization scenario, if the USB file generated by the GIR W150 server contains a new version of the controller's firmware, the scenario will upgrade the controller firmware and reboot after displaying the following message:

```
REBOOTING...
PLEASE  WAIT
```

If the controller was already paired to another GIR W150 server, it will ask the user to confirm the pairing with the new server:

```
NEW SERVER DETECTED.
PAIR W/ NEW SERVER?
```

Press the `Validate` key to confirm, or the `Cancel` key to quit the USB synchronization scenario:

```
PAIRING WILL ERASE
LOCAL DATA. OK?
```

Press the `Validate` key again to confirm, or the `Cancel` key to quit the USB synchronization scenario:

```
PAIR W/ NEW SERVER?
TYPE 255 TO CONFIRM
```

Press the `2`, `5` and `5` keys to continue the pairing and erase the existing controller data, or the `Cancel` key to quit the USB synchronization scenario.

7.4 Controller usage

When a controller is idle, it will display one of the following messages on its onboard display:

- `PUMP 1 AVAILABLE`, `SEL.PUMP 1 2`: messages referencing pump numbers indicate that one or more pumps are available. Other pumps numbers not mentioned in the message are not available.
- `TRANSAC. IN PROGRESS`: all available pumps are currently in use.
- `OUT OF ORDER`: no pump is available.

A typical refueling process will consist of the following steps:

1. Pump selection: select a pump number on the keyboard. This step is skipped when only one pump is defined on a controller.
2. Identification: vehicle and (optionally) driver identification, as defined in the configuration (see: Settings / Ident. modes).
3. Optional entries: Meter and NCE code entries, as defined in the configuration (see: Settings / Models).

During data entry, the process can be cancelled at any time by pressing the cancel key.
The message `TRANSAC. CANCELLED` will appear and the controller will return to the idle state.

A detailed diagram of the refueling process is available in the appendix (see: Refueling process).

7.4.1 Pump selection

```
Mo 03/09/16 08:30 .+
PUMP 1 AVAILABLE
```

or

```
Mo 03/09/16 08:30 .+
SEL.PUMP 1 2
```

Select the desired pump number.

```
P1 DIESEL
Validate your choice
```

The pump and the product name appears. Press the `Validate` key to continue.

Note:

- When only a single pump is defined on the controller, the pump selection step is skipped.
- When a pump is not available, pressing its number shows the reason.

A hypothetical terminal with three pumps defined might show the following:

```
Mo 03/09/16 08:30 .+
SEL.PUMP 1 2
```

In this situation, pumps 1 and 2 are available for use. Pressing `3` would display the reason why pump 3 is unavailable:

```
Pump 3 DIESEL
BLOCKED/SUPERV.
```

7.4.2 Identification

In the next step, a controller waiting for a driver or vehicle identification will display one of the following messages:

Controller waiting for a vehicle badge:

```
P1 DIESEL
VEHIC. BADGE
```

Controller waiting for a vehicle code:

```
P1 DIESEL
VEHIC. CODE
```

Controller waiting for a driver badge:

```
P1 DIESEL
DRIVER BADGE
```

Controller waiting for a driver code:

```
P1 DIESEL
DRIVER CODE
```

After a successful identification, the vehicle or driver label may be displayed on the terminal, but only if all vehicles/drivers identify by badge.

7.4.3 Meter entry

```
P1 DIESEL
Meter km:
```

Enter the odometer value. Units may vary.
Possible error messages:

- INCORRECT VALUE: The entered meter value is outside of the valid range. See Settings / Models.

An incorrect value entered for a meter can be forced, in the following cases:

- Operator-initiated transaction (see: Settings / Ident. modes). A confirmation message to accept the forced value will appear after the first incorrect entry.
- The meter setting is not set to *range (strict)*. A confirmation message to accept the forced value will appear after the same incorrect value is entered twice in a row.

7.4.4 Activity code

```
P1 DIESEL
Activity:
```

Enter the activity code. Use the **Code** field in the activity editor (See Settings / Activities)

7.4.5 NCE code entry

```
P1 DIESEL
NCE code:
```

Enter the NCE code. Any non-empty value will be accepted.

7.4.6 Pump timeouts

Once the previous steps are completed, the controller will display *READY TO PUMP*, the pump will engage and dispensing can take place.
During product dispensing, the following timeouts apply:

- If dispensing is not started within T_{begin} seconds, the transaction is stopped.
- Once dispensing is started, if it idles for more than T_{end} seconds, the transaction is stopped.
- If the pump nozzle is hung up, the transaction is stopped.

- Once the transaction has been stopped, the volume output is counted for an additional T_{after} seconds and included in the transaction. This accounts for compression of the pump hose.

T_{begin} and T_{end} are defined in the pump configuration (See Settings / Sites). T_{after} is fixed to two seconds.

7.5 Operator menu

The operator menu can be accessed by pressing "0" on idle:

- when the idle prompt is pump selection, just pressing "0" enters the operator menu
- when the idle prompt is vehicle or driver identification, pressing "0"+validate enters the operator menu

This menu has two entries:

```
1:PUMPS
2:GAUGES
```

- "1:PUMPS" asks for operator authentication, then runs the pumps unblocking scenario
- "2:GAUGES" doesn't ask for authentication, and shows the current tanks stocks reported by gauges

7.5.1 Pumps unblocking

The pumps unblocking scenario first asks for operator authentication, using an operator badge or code defined in the identification modes (see: Settings / Ident. modes).

Then, for each pump currently blocked on the controller, it prompts for unblocking:

```
P1 DIESEL
UNBLOCK?
```

Pressing the Validate key unblocks the pump, which then becomes available for normal use.
Pressing the Cancel key leaves the pump blocked, and moves on to the next pump blocked if there is one.

Hardware-based pump unblocking

It is also possible to unblock a pump without an operator badge or code by accessing the internal case of a controller.
This can be useful when a pump is blocked, no operator badge or code has been defined, and no server connection is available to perform the unblocking from the supervision menu.

The hardware-based pump unblocking method is as follows:

- Open the controller case
- On the pump module controlling the pump you want to unblock, toggle the auto/manual (A/M) switch to "manual" (LED on)
- The terminal prompts to unblock the pump, press the Validate key to confirm
- Set the A/M switch back to "auto" (LED off)

7.5.2 Gauges

The gauges menu shows the current volume of all gauges on a controller.
It is read-only, and can be accessed without authentication.
It can be disabled in the controllers settings (see: Settings / Sites).

For each gauge, this menu shows the current volume. The gauge device is actively polled and the value is updated in real-time when it changes.

```
T1 DIESEL          ./+
000000 / 000000 L   *
```

The indicators on the screen are as follows:

- at the top left, the tanker number and product
- at the top right, a navigation indicator showing if there are gauges before or after the current one. Pressing 7/9 or -/+ browses to the next or previous gauge
- at the bottom left, the current volume value, followed by the tank total capacity as defined in the settings
- at the bottom right, a "*" indicator is shown when there is a communication error with the gauge device. This tells that the volume reported may be out of date

When there are multiple compartments, the tank capacity is replaced by the compartment number and total compartments count on the tank:

```
T1 DIESEL          ./+
000000 L (1/N)      *
```

7.6 Operator identification

Operator identification mode in controllers is accessed by identifying with specific badges and codes defined in the identification modes (see: Settings / Ident. modes). Operator mode provides access to special menu options that are useful in two particular cases:

- To bypass normal refueling restrictions on vehicles, drivers, products, etc. — typically by "forcing" a particular vehicle or driver for the transaction.
- As a wildcard badge when a badge has been lost or forgotten.

Depending on the application configuration, Operator mode should be used in the following manner:

7.6.1 Vehicle code only

Forcing a vehicle code:

- VEHIC. CODE: Enter the operator code
- VEHIC. CODE: Enter the vehicle code

7.6.2 Vehicle badge only

Forcing a vehicle, vehicle badge lost

- VEHIC. BADGE: Use the operator badge
- VEHIC. CODE: Enter the vehicle code

7.6.3 Driver badge then vehicle code

Forcing a vehicle, forcing a driver, driver badge lost:

- DRIVER BADGE: Use the operator badge
- VEHIC. CODE: Enter the vehicle code

7.6.4 Driver badge then vehicle badge

Forcing a driver, driver badge lost:

- DRIVER BADGE: Use the operator badge
- VEHIC. BADGE: Use the vehicle badge

Forcing a vehicle, vehicle badge lost:

- DRIVER BADGE: Use the driver badge
- VEHIC. BADGE: Use the operator badge
- VEHIC. CODE: Enter the vehicle code

7.6.5 Driver code then vehicle badge

Forcing a driver: not possible.

If you are concerned that you may need to perform this action, it may be better to use the "vehicle badge then driver code" identification mode.

Forcing a vehicle, vehicle badge lost:

- DRIVER CODE: Enter the driver code
- VEHIC. BADGE: Use the operator badge
- VEHIC. CODE: Enter the vehicle code

7.6.6 Driver code then vehicle code

Forcing a driver:

- DRIVER CODE: Enter the operator code
- VEHIC. CODE: Enter the vehicle code

Forcing a vehicle:

- DRIVER CODE: Enter the driver code
- VEHIC. CODE: Enter the operator code
- VEHIC. CODE: Enter the vehicle code

7.6.7 Vehicle badge then driver code

Forcing a vehicle, forcing a driver, vehicle badge lost:

- VEHIC. BADGE: Use the operator badge
- VEHIC. CODE: Enter the vehicle code
- DRIVER CODE: Enter the driver code

7.6.8 Vehicle badge then driver badge

Forcing a vehicle, vehicle badge lost:

- VEHIC. BADGE: Use the operator badge
- VEHIC. CODE: Enter the vehicle code
- DRIVER BADGE: Use the driver badge

Forcing a driver, driver badge lost:

- VEHIC. BADGE: Use the vehicle badge
- DRIVER BADGE: Use the operator badge

7.6.9 Vehicle code then driver badge

Forcing a vehicle: not possible.

If you are concerned that you may need to perform this action, it may be better to use the “driver badge then vehicle code” identification mode.

Forcing a driver, driver badge lost:

- VEHIC. CODE: Enter the vehicle code
- DRIVER BADGE: Use the operator badge

7.6.10 Vehicle code then driver code

Forcing a vehicle, forcing a driver

- VEHIC. CODE: Enter the operator code
- VEHIC. CODE: Enter the vehicle code
- DRIVER CODE: Enter the driver code

Chapter 8

Specific features

GIR W150 has a number of additional features that are available in the Settings / Advanced / Features page. To make this tab visible, a valid QSC/RSC code must be entered via the button (see: Settings / QSC/RSC protection).

8.1 KM+Miles odometers (imperial)

This feature allows for vehicles with odometers in imperial miles to be used alongside others with odometers in kilometers.

When enabled, the *mi* and *mi + h* values is added as choices for the *Meter(s)* option .

Once *mi* or *mi + h* is selected for a product, the vehicle is considered to have an odometer in miles. When the vehicle is identified to a controller, the controller will prompt for its meter in miles. The odometer in the vehicle editor will also be shown in miles.

On the Vehicles, Drivers and Fuel transactions pages, a *km / mi* switch will be added on the left side of the page, below the *delete* icon. This switch can be used to dynamically change the units for all odometer values shown in all lists on the page.



8.2 Third-party services

The *Third-party services* feature allows the GIR W150 server to communicate with external web services. A *Third party services* tab appears in the Settings / Advanced section.

Third-party services fields:

- ***Type***: web service type. Currently, only *Meter collection* is available.

- ***Vendor***: web service provider. Available values:
  - *Ctrack*
  – *Eliot/OMP* (also allows to resolve vehicles if the vehicle of a transaction has the "generic" third-party ID, and GPS coordinates)
  – *Fleetmatics* (also allows to retrieve hour meter)
  – *Geotab* (also allows to retrieve hour meters and GPS coordinates)
  – *Geothentics*
  – *GPS Insight* (also allows to retrieve GPS coordinates)
  – *Groeneveld* (also allows to resolve vehicles if the vehicle of a transaction has the "generic" third-party ID)
  – *INGTECH*
  – *Isotrak*
  – *Matrix telematics* (also allows to retrieve GPS coordinates)
  – *NIBC Corcra* (also allows to retrieve hour meter)
  – *Ocean*
  – *Transics* (also allows to retrieve GPS coordinates)
  – *Trimble* (also allows to retrieve GPS coordinates)
  – *Truckonline* (also allows to retrieve GPS coordinates)
  – *Verizon Connect Fleet (TDE)*
  – *Verizon Networkfleet* (also allows to retrieve hour meter and GPS coordinates)

- ***Details***: customizes the web service URL and access credentials.

- ***Label***: optional label. If set, this value is appended to the third-party service label when the service is referenced elsewhere.

Meter collection services allow for vehicle meters to be retrieved automatically from third-party services so that they need not be entered by drivers during transactions.

If there is a *Meter collection* third-party service defined, a new field is added to the vehicle editor: *Meter collection*. Clicking this field opens a new window with the following options:

- ***Meter collection***: defines how the vehicle meter is retrieved for future transactions. Possible values:
  - *Manual*: the vehicle meter is input manually on the controller terminal (classic behaviour).
  – *Auto*: the vehicle meter is retrieved automatically from a third-party service.

- ***Meter collection service***: third-party service to use to retrieve the vehicle meter. Displayed if *Auto* Meter collection is selected.

- ***Third-party ID***: the vehicle ID as configured in the third-party service. Displayed if a Meter collection service is selected. A *Test* button will be visible to test whether the vehicle ID is correctly recognized by the third party service.

If a *Meter collection* third-party service with vehicle resolution (*Eliot/OMP) is defined, a new field is added to the driver editor: _Third-party ID*. Clicking this field opens a new window allowing to configure the driver ID as configured in

the third-party service. A *Test* button will be visible to test whether the driver ID is correctly recognized by the third party service, with an optional *Date* parameter which allows to simulate the vehicle resolution for a transaction.

8.2.1 Geofencing

Along with odometers and hour meters, some third-party services allow to fetch the GPS coordinates of a vehicle at the date of the fuel transaction. When such a service is defined in the application, this triggers some changes in the "Fuel transactions" page.

When a fuel transaction has GPS coordinates, this adds a *Map* tab in the fuel transaction editor, which contains the following markers:

- A green marker displaying the position of the vehicle for this transaction
- A red marker displaying site GPS position of the fuel transaction (if defined in the site settings)
- Blue markers displaying the GPS positions of all the other sites (if any)

Still in the fuel transaction editor, when both the transaction and its site have GPS coordinates, this adds the following field in the "Details" tab:

- ***Geofencing***: displays the distance between the transaction and its site, in km (or miles in US units)

When a third-party service defined in the application can resolve GPS coordinates, this adds a *Geofencing map* item in the *Fuel transactions* page action menu. This action is only enabled when the filtered collection results total count is less than 2000. When clicked, this shows a new window containing a map that displays:

- The GPS positions of all filtered transactions as green markers
- The GPS positions of all sites as blue markers

In the third-party services editors that can resolve GPS coordinates, this adds the following field:

- ***Geofencing radius***: threshold defining the maximum distance in km (or miles in US units) for the fuel transactions *Geofencing* values. When defined, the icon at the right of the *Geofencing* field in fuel transactions becomes red when its value exceeds this threshold

The *Geofencing radius* threshold also allows to trigger alerts:

- When there are transactions in the last 24 hours with an exceeding *Geofencing* distance, this displays a *Geofencing alert* item in the alert panel. The *(View)* link for this alert allows to see all the transactions that triggered this alert
- When a user has enabled the *Unauthorized refueling transactions* notification, this user will now receive an email alert when the resolved *Geofencing* distance of a new fuel transaction exceeds the third-party service *Geofencing radius* threshold

8.3 Generic badges

This feature enables multi-technologies badges for the *TLG* reader. It adds the following values to the Vehicles and Drivers identification modes:

- ***Generic TLG badge***
- ***Advanced badge***

With the TLG reader, more than 40 different RFID technologies are supported, in 125kHz and 13.56MHz ranges, including EM, HID, HITAG, ISO14443A/Mifare, ISO14443B, LEGIC, ISO15693...
The TLG reader can also be used to read EMG and MFG badges.

8.4 MFG badges

This feature enables the MFG badge technology. It adds the following value to the Vehicles and Drivers identification modes:

- ***MFG badge***

It also adds the *GemProx* reader device in the controller modules configuration.

8.5 BS125 badges

This feature enables the BS125 badge technology. It adds the following value to the Vehicles and Drivers identification modes:

- ***Advanced badge***

It also adds a *BS125* pump reader device in the controller modules configuration.

8.6 RPK badges

This feature enables the RPK badge technology. It adds the following values to the Vehicles and Drivers identification modes:

- ***RPK badge***
- ***Advanced badge***

It also adds a *RPK* pump reader device in the controller modules configuration.

8.7 ISO2 badges

This feature enables the ISO2 badge technology. It adds the following value to the Vehicles and Drivers identification modes:

- ***Advanced badge***

It also adds a *ISO2* reader device in the controller modules configuration.

8.8 iButton badges

This feature enables the iButton badge technology. It adds the following value to the Vehicles and Drivers identification modes:

- ***iButton S/N badge***

It also adds a *iButton* reader device in the controller modules configuration.

8.9 Tacho badges

This feature enables the Tacho badge technology. It adds the following value to the Drivers identification modes:

- ***Tacho badge***

It adds the following value to the Vehicles identification modes if *Driver + Vehicle* is selected in the *Identification* field:

- ***Tacho – Auto ID badge***

If drivers use *Tacho badge* and vehicles *Tacho – Auto ID badge*, then a second identification mode is allowed for vehicles.

It also adds a *Tacho* reader device in the controller modules configuration. In this module editor, the following parameters are available:

- ***Tacho. download***: if set to something else than *None*, enables the Tacho. download on this controller. Currently only works with *ETH/GPRS* communication mode, and not in *USB* mode. Possible values:
  - *None*: Tacho. download is disabled for this reader
  - *C1B (Daily)*: Tacho. download is enabled for this reader, C1B files will be downloaded at most once a day for a given Tacho card
  - *C1B (Forced)*: Tacho. download is enabled for this reader, C1B files will be downloaded more than once a day for a given Tacho card

When the Tacho. download is enabled on a controller, it adds a new event type: *Tacho. download*. This event allows to download the file if it succeeded, but if the Tacho. download stopped it contains the reason why it failed. The tacho. download is performed automatically on the controller when a Tacho. card is inserted.

8.10 RS-232 / Wiegand badges

This feature enables the RS-232 / Wiegand badge technology. It adds the following value to the Vehicles and Drivers identification modes:

- ***Advanced badge***

It also adds the *Passive RS-232* and *MR-Access* reader devices in the controller modules configuration.

8.11 Legacy Mifare badges

This feature enables the Legacy Mifare badge technology. It adds the following value to the Vehicles and Drivers identification modes:

- ***Legacy Mifare badge***

It also adds the *GemProx* reader device in the controller modules configuration.

8.12 PIN-protected badge or code

This features allows to use PIN security codes during the Vehicles and Drivers identification. For all the available identification modes, it adds a *"+ PIN code"* variant, which prompts for a PIN code after the badge or code identification.

8.13 US units

This feature enables United States customary units throughout the application. Kilometer units are replaced by miles, liters are replaced by gallons, L/100km is replaced by mpg, L/h is replaced by gal/h and millimeters are replaced by inches.

8.14 Cons. km/L

This feature displays all fuel consumptions in kilometer per liter (km/L) instead of L/100km.

8.15 AEAT exportación (AEAT export)

Activates the AEAT export, available for ES licenses only. Adds a *AEAT exportación* tab in the advanced parameters of the application, containing the following fields:

- ***Formato*** (Format): selects the formats used for the export. Available values: *CAE (.csv)*, *CIM (.xml)*, *CIM (.csv)*, *ATC Canaria – CAE (.xml)* and *ATC Canaria – CIM (.xml)*.
- ***Posición de palabra de la matricula*** (registration word position): selects the position of the work in the *ID* field in the vehicle editor which allows to fetch the vehicle registration number.
- ***NIF por vehículo*** (NIF per vehicle): if enabled, allows to define a NIF code per vehicle.

This feature adds the *AEAT* tabs in the product, site and vehicle editors containing fields used by the export, depending on the format selected (see below). It also adds the *AEAT – NIF* field in the department editor.

This feature adds the *AEAT exportación* action in the *Fuel transactions* page which allows to generate a new export or to download the previous exported files.

8.15.1 CAE (.csv)

This format enables the following fields:

- Vehicles: *Elegible AEAT*, *NIF* (if the NIF por vehículo_ option is enabled).
- Departments: *NIF*.
- Sites: *Elegible AEAT*, *NIF*, *CAE*, *Razón social*.
- Products: *AEAT – Código*.

The *AEAT exportación* export form for this format requires to select a *NIF* value, and exports transaction with the following filter:

- Product *Código*: not empty.
- Vehicle *AEAT eligible*: enabled.
- Site *AEAT eligible*: enabled.
- Site *CAE*: not empty.
- Vehicle / Department *NIF*: selected *NIF*.
- Site *NIF*: selected *NIF*.

The exported filename is "aeat-[NIF]-[date].csv".

8.15.2 CIM (.xml)

This format enables the following fields:

- Vehicles: *Elegible AEAT*, *NIF* (if the NIF por vehículo_ option is enabled).
- Departments: *NIF*.
- Sites: *Elegible AEAT*, *NIF*, *CIM*, *CodEE*, *Razón social*.
- Products: *AEAT – Código*.

The *AEAT exportación* export form for this format requires to select a *CodEE* value, and exports transaction with the following filter:

- Product *Código*: not empty.
- Vehicle *AEAT eligible*: enabled.
- Site *AEAT eligible*: enabled.
- Site *CIM*: not empty.
- Vehicle / Department *NIF*: not empty.
- Site *CodEE*: selected *CodEE*.

The exported filename is "aeat-[CodEE]-[date].xml".

8.15.3 CIM (.csv)

This format enables the following fields:

- Vehicles: *Elegible AEAT*, *NIF* (if the NIF por vehículo_ option is enabled).
- Departments: *NIF*.
- Sites: *Elegible AEAT*, *NIF*, *CIM*, *Razón social*.
- Products: *AEAT – Código*.

The *AEAT exportación* export form for this format requires to select a *Razón social* value, and exports transaction with the following filter:

- Product *Código*: not empty.
- Vehicle *AEAT eligible*: enabled.
- Site *AEAT eligible*: enabled.
- Site *CIM*: not empty.
- Vehicle / Department *NIF*: not empty.
- Site *Razón social*: selected *Razón social*.

The exported filename is “aeat-[Razón social]-[date].csv”.

8.15.4 ATC Canaria – CAE (.xml)

This format enables the following fields:

- Vehicles: *Elegible ATC Canaria*, *NIF* (if the NIF por vehículo_ option is enabled).
- Departments: *NIF*.
- Sites: *Elegible ATC Canaria*, *NIF*, *CAE*, *Razón social*.
- Products: *ATC Canaria – Tipo*.

The *AEAT exportación* export form for this format requires to select a *NIF* value, and exports transaction with the following filter:

- Product *ATC Canaria – Tipo*: not empty.
- Vehicle *Elegible ATC Canaria*: enabled.
- Site *Elegible ATC Canaria*: enabled.
- Site *CAE*: not empty.
- Vehicle / Department *NIF*: not empty.
- Site *NIF*: selected *NIF*.

The exported filename is “atc-[NIF]-[date].xml”.

8.15.5 ATC Canaria – CIM (.xml)

This format enables the following fields:

- Vehicles: *Elegible ATC Canaria*, *NIF* (if the NIF por vehículo_ option is enabled).
- Departments: *NIF*.
- Sites: *Elegible ATC Canaria*, *NIF*, *CIM*, *CodEE*, *Razón social*.
- Products: *ATC Canaria – Tipo*.

The *AEAT exportación* export form for this format requires to select a *CodEE* value, and exports transaction with the following filter:

- Product *ATC Canaria – Tipo*: not empty.
- Vehicle *Elegible ATC Canaria*: enabled.
- Site *Elegible ATC Canaria*: enabled.
- Site *CIM*: not empty.
- Vehicle / Department *NIF*: not empty.
- Site *CodEE*: selected *CodEE*.

The exported filename is “atc-[CodEE]-[date].xml”.

8.16 Excises export

Activates the Excises export, available for BE licenses only. Adds a *Excises export* tab in the advanced parameters of the application, containing the following field:

- ***Product***: product on which the excises export apply.

This tabs also allows to define periods. Each period contains the following fields:

- ***From (start date)***: start date of the period.
- ***To (end date)***: end date of the period.
- ***Rate***: refund rate used for this period.

This feature adds the *Excise* tabs in vehicles and in manual deliveries, both containing the same *Excises eligible* field.

This feature adds the *Excises export* action in the *Fuel transactions* page which allows to generate the export for the site and dates provided. Once the export is generated, it is possible to print it.

8.17 Name + First name

This feature adds the *First name* field in drivers collection and editor.

8.18 Other features

8.18.1 Hide volume units

This feature removes the *L* or *gal* units from the GIR W150 server application and from the controller terminal screens.

8.18.2 Show vehicles impexp IDs

This feature adds an *Impexp ID* field to the vehicle editor. This is used to provide compatibility with the ID requirements of external third-party applications. The *Impexp ID* value is then be used as the *vehicle.id* value when exporting data.

8.18.3 Show drivers impexp IDs

This feature adds an *Impexp ID* for drivers.

8.18.4 Show settings impexp IDs

This feature adds an *Impexp ID* for entities in the settings.

Appendix A

System prerequisites

A.1 Server machine

For an On-Prem installation with a few controllers, the machine hosting the GIR W150 server must meet the following requirements:

- Operating system: Windows 7, Windows Server 2008 R2 or later
- Memory: at least 2 GB
- Available disk space: the disk space used is very dependent on configuration and usage. Generally, it is recommended to have at least 10 GB available for the application.

For an On-Prem installation with many controllers (20 or more), the machine capabilities must be adapted to the expected usage. Contact GIR for more information.

A.2 Client machine

The client machine must run one of the supported web browsers:

- Google Chrome, Mozilla Firefox, Microsoft Edge: an up-to-date version of the consumer or enterprise releases. In practice, any reasonably recent version (less than one or two years old) should work.
- Apple Safari: version 11 or later
- Android Browser: version 5 or later

A.3 Storage capacities

GIR W150 server and controllers can support up to:

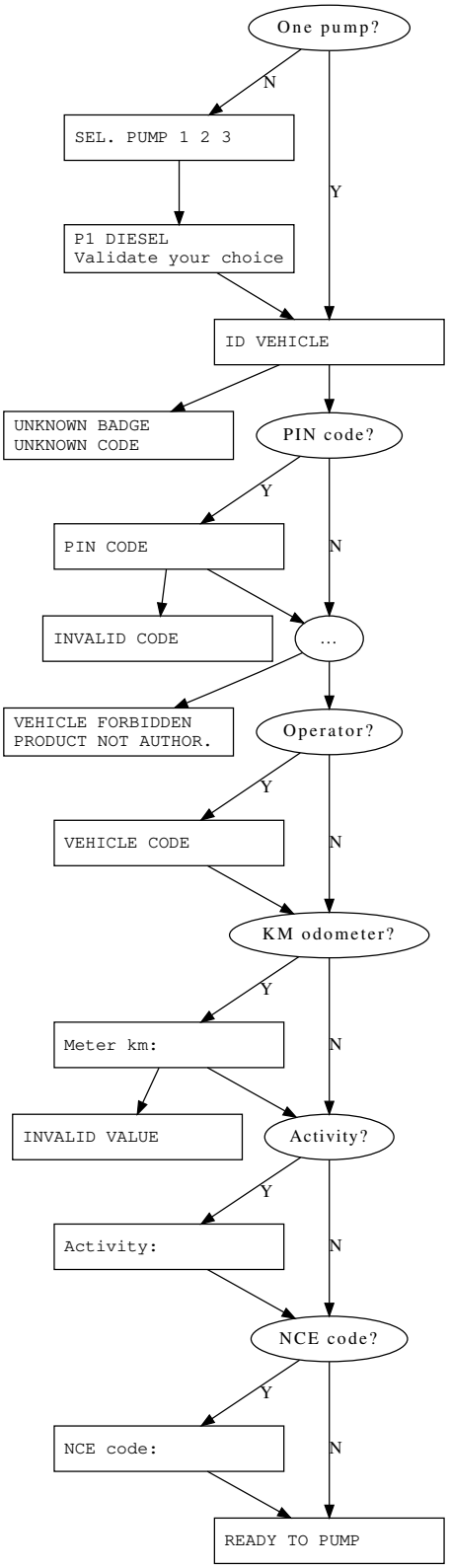
- 16 products
- 3000 vehicles

- 3000 drivers
- 50 controllers
- 1000 activities
- 1000 models
- 150000 transactions (Controller autonomy: 2500 transactions)

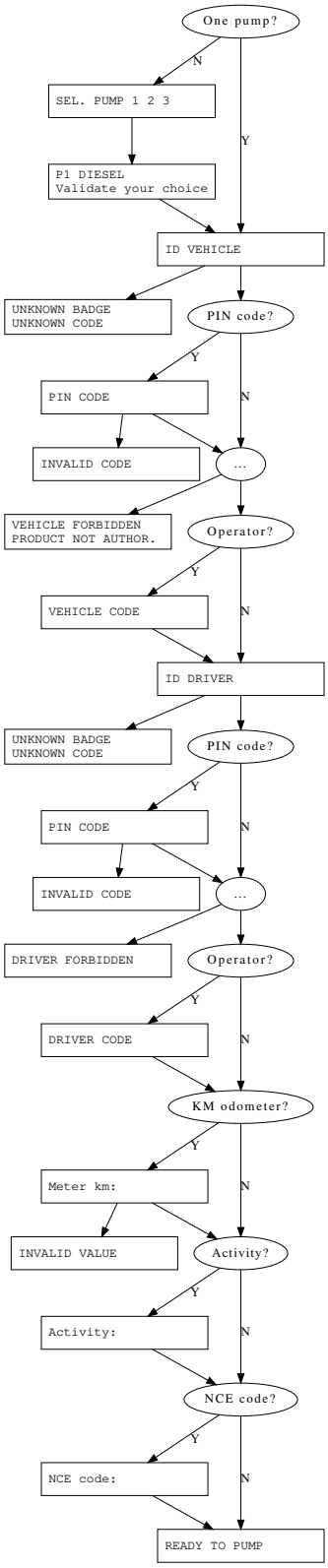
Appendix B

Fueling scenario

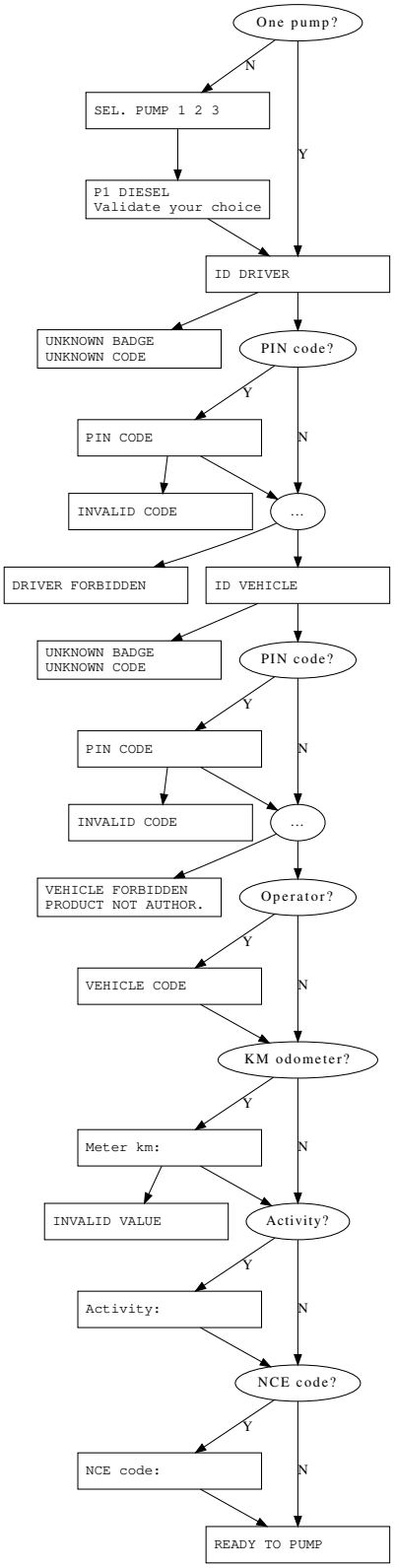
B.1 Vehicle only



B.2 Vehicle + driver



B.3 Driver + vehicle



Appendix C

Vehicles and drivers import and export

This chapter describes the methods available for importing or exporting vehicles and drivers.

These are mechanisms to automate the reading, creation, modification or deletion of vehicles or drivers, in order to synchronize this data between GIR W150 and a third-party system (for instance an employee directory, a fleet management software, ...).

Vehicle and driver import and export can be performed:

- programmatically, with web services
- manually, using "Bulk import" to copy/paste from a spreadsheet

Web services documentation can also be found online at https://apidoc-gir-w150.klervi.com/.

The following sections, Vehicles, Drivers, and Common mechanisms, describe the data model as well as a number of mechanisms that are common between all methods. The specifics of each import/export method are then discussed in the sections Web services and Bulk import.

C.1 Vehicles

This table describes the data model of vehicles, available in the `/api-impexp/vehicles` web service.

Name	Type	Description
`id`	ID	Vehicle identifier
`name`	Text	ID (label) of the vehicle (mandatory)
`badge`	Text	Badge used for identification
`pubsn_badge`	Text	Public S/N badge (read-only)
`code`	Text	Code used for identification
`pin_code`	Text	PIN code
`model.id`	ID	Model identifier
`model.name`	Text	Model name
`department.id`	ID	Department identifier
`department.name`	Text	Department name
`kmeter`	Integer	Odometer (in km or miles)
`hmeter`	Decimal	Hour meter (in hours)
`notes`	Text	Additional notes for this vehicle
`vtanks[].product.id`	ID	Product identifier
`vtanks[].product.name`	Text	Product name

C.2 Drivers

This table describes the data model of drivers, available in the `/api-impexp/drivers` web service.

Name	Type	Description
`id`	ID	Driver identifier
`name`	Text	Driver name (mandatory)
`first_name`	Text	Driver first name (1)
`badge`	Text	Badge used for identification
`pubsn_badge`	Text	Public S/N badge (read-only)
`code`	Text	Code used for identification
`pin_code`	Text	PIN code
`department.id`	ID	Department identifier
`department.name`	Text	Department name
`activity_prompt`	Boolean	Activity code prompt
`nce_prompt`	Boolean	NCE code prompt
`notes`	Text	Additional notes for this driver

(1): only when the *Name + First name* feature is enabled

C.3 Common mechanisms

C.3.1 Identifiers

Each object (vehicles, drivers, departments, models, products...) is uniquely identified by its `id` field. This field must be unique, to avoid ambiguities when referencing an object.

GIR W150 automatically generates a unique identifier for all objects, as a UUID. It is recommended to use this auto-generated ID in most cases, as the guarantee of uniqueness is then assured by GIR W150 .

In some cases, it can be relevant to use external identifiers, typically coming from a third-party system. This is possible by enabling the "Impexp ID" features in the *Advanced / Features* tab of the application settings:

- *Show vehicle impexp IDs*: enables external IDs for vehicles.
- *Show driver impexp IDs*: enables external IDs for drivers.
- *Show settings impexp IDs*: enables external IDs for departments, models, products, sites and activities.

When impexp IDs are enabled for a given object type:

- An *Impexp ID* field is displayed in the application, where the external ID can be entered manually.
- An *Impexp ID* value must be defined in the `id` field when a new record is created with the API.
- An *Impexp ID* value must be set in the `id` field to reference an existing object.

When impexp IDs are enabled, the third-party system is fully responsible for setting the `id` field in the API, when creating new objects or referencing existing ones. If impexp IDs are enabled on an entity that doesn't have an *Impexp ID* value defined, GIR W150 falls back to the default auto-generated UUID. This situation should be considered as exceptional: for instance, it can happen just after the impexp IDs feature is enabled on a non-empty database, when all impexp ID values haven't been set yet. It is highly discouraged to mix Impexp IDs and UUIDs usage for a given entity: if you decide to use impexp IDs for vehicles, then all vehicles should have an *Impexp ID* value defined.

Caution: while using external IDs can sometimes simplify the development of an interface between GIR W150 and a third-party system, that system must then assume full responsibility for generating and maintaining unique IDs. We recommend enabling this feature only when the detailed technical implications are well understood. Also note that *Impexp IDs* are visible and editable manually in the application. If two IDs are identical, this can cause conflict errors.

C.3.2 References

Some fields in the data model are references to other entities, such as:

- `department`, `model`, and `product` in vehicles
- `department` in drivers

The behaviour when reading and writing *reference* fields is different than when dealing other fields. The properties within these fields (such as the `name` of a department) are shared between other records with a matching `id` property in the reference field. Changing any properties within the reference field of a record will also change the properties in the reference field of all other records that contain a matching `id` property.

When writing data (via POST or PUT request), if no `id` is provided, then an attempt is made to resolve the `id` value to an existing reference field value with the same `name` value. If no matching value is found, then a new `id` is assigned.

For instance, a PUT request on a vehicle containing `"model":{"name":"m1"}` will:

- Search if there is a model whose name is "m1".
- If the "m1" model is found, assign it to the vehicle.
- If the "m1" model is not found, create a new "m1" model and assign it to the vehicle.

Resolving an entity uses the `id` field when it is set in a request, and the `name` field otherwise.
If both `id` and `name` are set, the search is performed by `id`, and the `name` field of the referenced entity is modified if needed, to match the request content.

Constraints on references

In vehicles, tanks are identified by their product (`vtanks[].product` field). As products are part of the protected settings, it is not possible to create a new product through a vehicle creation or update, but only to reference an existing product, by ID or by name. A vehicle can't have two tanks referencing the same product.

C.4 Web services

Web services expose a REST API in JSON format.

They are available at <app_url>/api-impexp/vehicles and <app_url>/api-impexp/drivers, where <app_url> is the same URL you use to access the application web interface.
HTTP methods GET, POST, PUT, and DELETE are used to perform the different operations.

Vehicles are available at /api-impexp/vehicles:

- `GET /api-impexp/vehicles`: Read the vehicles list
- `GET /api-impexp/vehicles/<id>`: Read a vehicle
- `POST /api-impexp/vehicles`: Create a vehicle
- `PUT /api-impexp/vehicles/<id>`: Update a vehicle
- `DELETE /api-impexp/vehicles/<id>`: Delete a vehicle

Drivers are available at /api-impexp/drivers:

- `GET /api-impexp/drivers`: Read the drivers list
- `GET /api-impexp/drivers/<id>`: Read a driver
- `POST /api-impexp/drivers`: Create a driver
- `PUT /api-impexp/drivers/<id>`: Update a driver
- `DELETE /api-impexp/drivers/<id>`: Delete a driver

C.4.1 Authentication

Accessing web services requires authentication. An HTTP header `"X-Klervi-API-Key: <apikey>"` must be added to the request, where `<apikey>` is the value of the *Impexp API key* field in the *Advanced / Impexp* tab of application settings. If this header is missing or invalid, an authentication error is returned (401).

C.4.2 HTTP status codes

The API uses HTTP status codes to indicate the success or failure of an operation:

- a 2XX status code indicates a successful operation.
- a 4XX status code indicates an error due to request content. Retrying the same request will cause the same error.
- a 5XX status code indicates an internal or temporary error. Retrying the same request may succeed.

When an error occurs, a message in the response body contains a detailed description of the problem.

In the future, new fields may be added to the JSON body of server responses (both success and failure). The caller must be prepared for this, by not assuming anything about field names that are not presently documented in this API. The HTTP status code alone should be used to determine whether an operation is successful – not the fact that the response body is empty (as this behaviour may change in the future). Certain API requests do currently return empty objects upon successful completion.

The table below lists some common responses and their HTTP status code:

Code	Description	Cause
200	OK	Success
400	Bad Request	Request content is invalid (for instance: bad JSON, mandatory `name` field not set, inconsistent data...)
401	Unauthorized	The X-Klervi-API-Key header is missing or incorrect
404	Not found	GET request on an object whose id is unknown
405	Method Not Allowed	HTTP method is not supported on this resource
409	Conflict	The object identifier (`id`) is not unique
500	Internal error	Temporary error due to some server condition

C.4.3 Requests/Reponses content

This section describes the general structure of HTTP requests and responses. It uses URLs with the vehicles web services as an example, but all information here is generic and also applies to the drivers web services.

POST /api-impexp/vehicles

A POST request creates a new object:

- The request body must be a JSON object, matching the data model.
- Fields indicated as mandatory in the data model (for instance, for vehicles, the `name` field) must be defined.
- Other fields are optional and may be omitted, in which case the object is created with default values (for instance, if the `vtanks` field is omitted when creating a vehicle, it will be created with products defined as *Authorized by default* in the settings).

The response to a POST returns the created object in the `<result>` field.

PUT /api-impexp/vehicles/<id>

A PUT request modifies an existing object:

- The request body must be a JSON object, matching the data model.
- Omitted fields are left unchanged.

The response to a PUT returns the modified object in the `<result>` field.

DELETE /api-impexp/vehicles/<id>

A DELETE request deletes an existing object.

The response to a DELETE is an empty JSON object.

Note: a DELETE on a non-existing ID is considered as successful, and returns "200 OK". See the Idempotency section for the reason of this behaviour.

GET /api-impexp/vehicles/<id>

A GET request on an individual object gets the data for this object.

The response to a GET returns the requested object in the `<result>` field.

GET /api-impexp/vehicles

A GET request on a collection lists all object of a given type (for instance all vehicles). This call accepts optional parameters in the "Query string":

- `<limit>` defines the maximum number of objects to return in the response (by default: 500).
- `<offset>` defines the position of the first object to return in the `<result>` array (by default: 0, i.e. return the first object and its successors).

The response to a GET returns the following fields:

- `<result>`: an array containing at most `<limit>` objects, starting from position `<offset>`.
- `<offset>`: number of objects ignored before the first object returned. This value always matches the `<offset>` value set in the request.
- `<more>`: a boolean indicating if the limit of the `<result>` array is reached. When `<more>` is `true`, there remains objects to read, and a new GET request has to be performed, by incrementing the offset to get the rest of the data. When `<more>` is `false`, the end of the list has been reached and all objects have been read.

The `<limit>` and `<offset>` parameters coupled with the `<more>` field provide a paging mechanism, allowing to browse a full collection with several GET requests, even when the collection contains a lot of elements. In order to keep reasonable sizes for HTTP responses, it is recommended to not use "pages" of more than a few hundred elements. The server may restrict the maximum value of the `<limit>` parameter.

C.4.4 Idempotency

When a request is sent to the server and a network problem occurs, the caller may not get a response. In such a case, the caller will have to re-emit the request.

However, the caller may not always be able to know if the network error occurred when transmitting the request to the server, or when receiving the response. In the first case, there is nothing special to watch out for: the caller simply re-emits the request, and the server processes it. The second case is more complex as it requires that all requests are idempotent to avoid undesired duplicates. In other words, sending a request once or several times must produce the same result server-side.

- GET requests are idempotent by nature, as they do not change the server state.
- PUT requests are idempotent as well: if the server receives a PUT request for the second time, all fields will already have the correct value, and the server state will remain unchanged.
- DELETE requests are made idempotent by considering that deleting an unknown ID is always successful. This way, if the caller doesn't receive the response to a first DELETE request and re-emits it, it will still receive a "200 OK" response, indicating that the object is indeed no longer in the database.
- POST requests are the most problematic: as they do not contain an ID (except when using Impexp ID: see below), the server has no way to know if a POST request to create a new object has already been processed or not. This can be solved by the `X-Klervi-Idempotency-Key` HTTP header, which does the following:
  - The value defined by this header is called an "idempotency key"
  - When a POST request contains an idempotency key, the key is associated to the object created, for 24 hours after the first request has been processed.
  - If an idempotency key has already been processed, the rest of the POST request is ignored (as the creation already occurred), and the associated object is simply returned. In such a case, the request is equivalent to a GET request with the object identifier.

For POST requests without an Impexp ID, is is recommended to use the `X-Klervi-Idempotency-Key` header, with a random or content-related idempotency key, which is re-transmitted as is when there are retries. Without this header, a network error at the wrong time may cause duplicates to be created when there are retries.

Idempotency and Impexp ID

When using the *Impexp ID* feature (see the Identifiers section), POST requests can contain an external ID, and are then naturally idempotent. The `X-Klervi-Idempotency-Key` HTTP header remains operative if it is set, but it is no longer required.

For convenience, when external IDs are enabled, a PUT request on an unknown ID is interpreted as a creation operation, and is naturally idempotent as well.

C.4.5 Examples

Create a vehicle with a license plate and a badge

Request:

```
POST /api-impexp/vehicles
```

```
{
  "name": "AA-001-AA",
  "badge": "20000001"
}
```

Response:

```
{
  "result": {
    "id": "bb1fe6ad-c986-4e4e-be2e-78fa5bf828e7",
    "name": "AA-001-AA",
    "badge": "20000001",
    ...
    "vtanks": [ {
      "product": {
        "id": "3e565959-e6b5-4de3-8c69-dbe3d476d893",
        "name": "DIESEL"
      }
    } ]
  }
}
```

Modify the badge of a vehicle

Request:

```
PUT /api-impexp/vehicles/bb1fe6ad-c986-4e4e-be2e-78fa5bf828e7
```

```
{
  "badge": "20000002"
}
```

Response:

```
{
  "result": {
    "id": "bb1fe6ad-c986-4e4e-be2e-78fa5bf828e7",
    "name": "AA-001-AA",
    "badge": "20000002",
    ...
  }
}
```

List all vehicles, in "pages" of ten

We assume the database contains 14 vehicles, from AA-001-AA to AA-014-AA.

Request 1: the `offset` parameter is implicitly zero.

```
GET /api-impexp/vehicles?limit=10
```

Response 1: the `result` array contains 10 vehicles, the `more` boolean to `true` indicates that there are more vehicles.

```
{
  "result": [
    { "name": "AA-001-AA", ... },
    { "name": "AA-002-AA", ... },
    { "name": "AA-003-AA", ... },
    ...
    { "name": "AA-010-AA", ... }
  ],
  "offset": 0,
  "more": true
}
```

Request 2: to continue listing vehicles, we set the `offset` parameter to 10.

```
GET /api-impexp/vehicles?offset=10&limit=10
```

Response 2: the `result` array contains 4 vehicles, the `more` boolean to `false` indicates that this is the end of the list.

```
{
  "result": [
    { "name": "AA-011-AA", ... },
    { "name": "AA-012-AA", ... },
    { "name": "AA-013-AA", ... },
    { "name": "AA-014-AA", ... }
  ],
  "offset": 10,
  "more": false
}
```

Read a vehicle

Request:

```
GET /api-impexp/vehicles/bb1fe6ad-c986-4e4e-be2e-78fa5bf828e7
```

Response:

```
{
  "result": {
    "id": "bb1fe6ad-c986-4e4e-be2e-78fa5bf828e7",
    "name": "AA-001-AA",
    "badge": "20000002",
```

```
    "code": "",
    "pin_code": "",
    "model": null,
    "department": null,
    "kmeter": 0,
    "hmeter": 0,
    "vtanks": [ {
      "product": {
        "id": "3e565959-e6b5-4de3-8c69-dbe3d476d893",
        "name": "DIESEL"
      }
    } ]
  }
}
```

Delete a vehicle

Request:

```
DELETE /api-impexp/vehicles/bb1fe6ad-c986-4e4e-be2e-78fa5bf828e7
```

Response:

```
{}
```

The deleted vehicle is no longer in the vehicles list, and a GET on its id returns a 404 error.

Create a driver with a name and a code

Request:

```
POST /api-impexp/drivers
```

```
{
  "name": "Martin",
  "code": "1234"
}
```

Response:

```
{
  "result": {
    "id": "a3cffa32-f795-4a21-9131-1127f7c8efcf",
    "name": "Martin",
    "code": "1234",
    ...
  }
}
```

Read a driver

Request:

```
GET /api-impexp/drivers/a3cffa32-f795-4a21-9131-1127f7c8efcf
```

Response:

```
{
  "result": {
    "id": "a3cffa32-f795-4a21-9131-1127f7c8efcf",
    "name": "Martin",
    "first_name": "",
    "badge": "",
    "code": "1234",
    "pin_code": "",
    "department": null,
    "activity_prompt": false,
    "nce_prompt": false
  }
}
```

Modify the department of a driver

Request:

```
PUT /api-impexp/drivers/a3cffa32-f795-4a21-9131-1127f7c8efcf

{
  "department": { "name" : "D1" }
}
```

Response: the driver has been assigned to the "D1" department, which has been created if needed.

```
{
  "result": {
    "id": "a3cffa32-f795-4a21-9131-1127f7c8efcf",
    "name": "Martin",
    "code": "1234",
    "department": {
      "id": "702f6726-bd13-4916-adb9-9840064cd7bf",
      "name": "D1"
    },
    ...
  }
}
```

C.5 Bulk import

The bulk import mechanism allows to quickly import into the application vehicles or drivers from a spreadsheet.

The imported or exported data is constituted by a first header line defining the fields for each column, followed by N lines of vehicles or drivers. The fields in a line are separated by tab characters.

To access to that feature, navigate to the *Vehicles* or the *Drivers* page. Then click directly on the info icon in the action menu, without selecting any vehicle or driver to the list. This will open a new window containing the *Bulk operations* tab. When you select this tab, the following actions are available:

- ***Bulk update***: allows to update or delete all the records currently displayed in the collection.
- ***Bulk import***: allows to import multiple drivers or vehicles at the same time.
- ***Bulk export***: allows to export all the drivers or vehicles currently displayed in the collection.

C.5.1 Basic usage

To correctly import vehicles or drivers, this is the recommended workflow:

1. First, configure the application settings to your needs (features, products).
2. Create a sample vehicle or driver in the application. If needed, create also a sample department, model or activity.
3. Click on *Bulk import* in the *Bulk operations* tab of the info window.
4. On the top half of the window, you'll find your sample vehicle or driver in a tab-separated text format. Copy/paste the contents of this data to an empty spreadsheet to get the import columns, and your sample vehicle or driver as an example.
5. Fill your spreadsheet with all the vehicles or drivers to import. The first column should be the primary key used to resolve existing vehicle or drivers (example: code, badge, name).
6. Copy/paste your spreadsheet cells (**including the headers**) to the bottom half text area of the import window.
7. Click on *Preview* and check that there are no errors.
8. Finally, click on *Import* to save the vehicles or driver imported.

C.5.2 Bulk import fields

All fields defined in the Vehicles and Drivers sections can be used. For example:

- `name`: vehicle/driver name.
- `department.parent.name`: direction name.
- `vtanks[0].product.name`: 1st product name.

Those field names can be a bit complicated, as they are intended for programmatic usage. To make manual usage easier, aliases are used automatically in *Bulk export* and *Bulk import*, for the most common cases.

For instance, the following aliases are available for vehicles:

Alias	Original field name	Type	Description
`model`	`model.name`	Text	Model name
`department`	`department.name`	Text	Department name
`department.id`	`department.name`	ID	Department identifier
`department.name`	`department.name`	Text	Department name
`product1`	`vtanks[0].product.name`	Text	1st product name
`product1.id`	`vtanks[0].product.id`	ID	1st product identifier
`product1.name`	`vtanks[0].product.name`	Text	1st product name
`product2`	`vtanks[1].product.name`	Text	2nd product name

The following fields are also available for vehicles and drivers bulk import (they are however not exported):

Name	Type	Description
`tps_id`	Text	Third-party ID used by Third-party services (1)

(1): only when the *Third-party services* feature is enabled

C.5.3 Bulk import preview

In the *Bulk import* window, after you click on *Preview*, you can review the changes that will be applied to the database before clicking on *Import*:

- ***Pending changes***: summary of the changes that will be applied to the database once the import is validated.
- ***Errors***: list of warnings or errors ordered by line number.
- ***Preview***: list of vehicles or drivers as they would be seen in the application once the import is validated. A click on a line opens a window showing the details for that record.

Click on *Import* to validate those changes or on *Back* to go back to the previous screen.

Appendix D

Transactions export

This appendix describes the different transactions export methods available:

- The HLF1 file format export
- The C4 file format export
- The transactions export web service

D.1 Export mechanisms

D.1.1 File export

The file export format and parameters can be defined in the application settings, in the *Advanced / Impexp* tab. When enabled, it exports files in the impexp/export/todo directory (on Windows it's typically C:\girw150\data\impexp\export\todo). When you are done with an export file, we recommend you to move this file to the impexp/export/done directory.

One parameter in particular (*Transac. change*) defines how transactions changes are tracked:

- *None (do not export changes)*: only transactions creations are exported.
- *Update (one new line per change)*: a transaction modification is exported as a new line which updates a previous transaction.
- *Diff (two new lines per change)*: a transaction modification is exported as two lines: the first line cancels the previous transaction, and the second line creates a new transaction with updated values.
- *Full diff (multiple new lines per change)*: a transaction modification is exported as at least two lines, and sometimes more, in case of cascading changes on the following fields: `kdelta`, `kcons`, `hdelta`, `hcons`.

D.1.2 Web service export

The web service exports uses HTTP calls and returns the exported data in the JSON format.

In order to access those web services, you'll have to add the "X-Klervi-API-Key: <apikey>" HTTP header where <apikey> is the value of the *Impexp API key* field in the *Advanced / Impexp* tab of your application settings. You also have to allow the API key to read the application data: the *Authorization* field in the advanced window of this setting needs to be set to *Read-only* or *Read/Write*.

The JSON response is structured like this:

```
{
  "result": [
    {
      "id": "05008e00-5d00-0000-005a-005500e336f1",
      ...
    },
    ...
    {
      "id": "0f000d00-7800-4800-005a-005500e43745",
      ...
    }
  ],
  "more": true
}
```

- <result> is the array containing the exported data. Please note that if the size of this array hits a predetermined limit, we'll stop sending you data and you'll have to call the web service once again with the right parameters to get the rest of the data.
- <more> is a boolean set to true if the limit of <result> is hit and there is some data left.
- <id> is an unique identifier for an exported element.

If <more> is set to true and you'd like to fetch more data, just add the ?last_id=lastidfetched query-string parameter to the URL where <lastidfetched> is the last exported element <id> you fetched with this web service. The response will then contain the following elements. For the example above, you would use ?last_id=0f000d00-7800-4800-005a-005500e43745.

?change=mode is another useful query-string parameter defining how transactions changes are tracked, where <mode> can take the following values:

- none: only transactions creations are exported.
- update: a transaction modification is exported as a new element which updates a previous transaction.
- diff: a transaction modification is exported as two elements: the first one cancels the previous transaction, and the second one creates a new transaction with updated values.
- fulldiff: a transaction modification is exported as at least two elements, and sometimes more, in case of cascading changes on the following fields: kdelta, kcons, hdelta, hcons.

If no <change> parameter is added, the default behavior of the web service is the same as ?change=diff.

D.1.3 Recommendations

- Don't make any assumption about the order of the exported transactions. For instance, they are not always ordered by date, e.g. when there are modifications, or when some transactions were not received by the server just after being made. The export mechanism with the `<last_id>` parameter guarantees that all transactions are exported.
- New columns or fields can be added to the export formats anytime.

D.1.4 Fuel transactions ledger

The lines exposed by the web service and the file export when the *Transac. change* parameter is set to *Diff* can be vizualized in the application web interface by selecting a record in the *Fuel transactions* page, then by opening the *Info* window and displaying the *Ledger* tab. The *id* column in that tab match the `id` field in the web service response or C4 format, which is the export line UUID and also the value to pass to the `<last_id>` parameter of the web service.

The detailed view of each record in this tab contains all the exported fields using the C4 format below.

At the top right corner of the tab, a link allows to access to the dedicated *Fuel transactions ledger* page.

D.2 HLF1 format

D.2.1 General

The HLF1 export format exported by GIR W150 is fully compatible with GIR W100 and GIR W200 servers HLF1 export format.
For a full description of the *GIR HLF1* format please refer to the *GIR Titan-Hykkoris* (W100) documentation.
NB.: when creating a new file-based interface please consider using the newer C4 export format described below.

D.2.2 Export IDs (Identifiers)

Each exported HLF1 row is identified by its unique `id`. An exported row may handle 3 different cases:

- Creation of a fuel transaction: exported `id` is a new unique identifier.
- Deletion of a fuel transaction: the exported `id` is the same as the initial transaction creation.
- Update of a fuel transaction: exported `id` is a new unique identifier.

WARNING: The HLF1 format doesn't provide any trivial way to know which transaction has been updated when using the *Update (one line per change)* option. Therefore the *Diff (two new lines per change)* should generally be used when tracking changes with the HLF1 export format.

D.3 C4 format

D.3.1 General

The C4 exported files are text files containing fuel transactions. Each line ends with CRLF (ASCII hex codes `0x0D` & `0x0A`) and represents a transaction, except the first one if there's a header. The file is encoded in UTF-8.

All fields are separated by a comma (`,` – ASCII hex code `0X2C`) and can take an unlimited number of characters.

Field types:

- Text values are delimited by a double quote sign (`"` – ASCII hex code `0x22`)
- ID values are also delimited by double quotes
- Datetime values are in UTC in the ISO 8601 format (i.e.: `YYYY-MM-DDTHH:mm:ssZ`), in double quotes as well
- Decimal values use the dot notation (`.` – ASCII hex code `0x2E`) with a possible minus sign in front of it (e.g.: `-3.14`), without space.
- Boolean values are either `false` or `true` without quotes

D.3.2 Export IDs (Identifiers)

Each exported C4 row is identified by its unique `id`. An exported row may handle 3 different cases:

- Creation of a fuel transaction: exported `id` is a new unique identifier. Actual transaction is identified by the `transac_id` field.
- Deletion of a fuel transaction: exported `id` is a new unique identifier. Actual transaction is identified by the `transac_id` field. NB: in this case the `_deleted` field is set to `true`.
- Update of a fuel transaction: exported `id` is a new unique identifier. Actual transaction is identified by the `transac_id` field.

D.3.3 Fuel transaction URL

A link to a fuel transaction in GIR W150 can be built with:
`https://<domain>/r/transac_fuels/<transac_id>`

- `<domain>`: the domain name you use to access your application
- `<transac_id>`: the `transac_id` field (ex: 338d031b-cef7-43f0-afba-dc0f1b5b76f0)

D.3.4 Columns

The table below lists the CSV columns for the GIR C4 format. Additional columns may be added after those described here, but the position of the following columns is guaranteed not to change.

Position	Name	Type	Description
01	`id`	ID	Export line UUID (unique)
02	`transac_id`	ID	Transaction public ID
03	`_deleted`	Boolean	`true` if the transaction was cancelled
04	`type`	Text	`int` (internal) or `ext` (external). Other possible value: `tanker` (3)
05	`date`	Datetime	Date + time in UTC
06	`vehicle.id`	ID	Vehicle public ID
07	`vehicle.name`	Text	Vehicle name (labeled as "ID" in the UI)
08	`vehicle.badge`	Text	Vehicle badge (4)
09	`vehicle.code`	Text	Vehicle code (4)
10	`driver.id`	ID	Driver public ID
11	`driver.fstname`	Text	Driver first name
12	`driver.name`	Text	Driver name
13	`driver.badge`	Text	Driver badge (4)
14	`driver.code`	Text	Driver code (4)
15	`department.id`	ID	Department public ID
16	`department.name`	Text	Department name
17	`product.id`	ID	Product public ID
18	`product.name`	Text	Product name
19	`volume`	Decimal	Distributed volume (L or gal) (1)
20	`unit_price`	Decimal	Unit price (1)
21	`kmeter`	Integer	Odometer (km or Miles) (1)
22	`hmeter`	Decimal	Meter in hours
23	`activity.id`	ID	Activity public ID
24	`activity.name`	Text	Activity name
25	`nce_code`	Text	NCE code
26	`site.id`	ID	Site public ID
27	`site.name`	Text	Site name
28	`pump`	ID	Pump number
29	`manual`	Boolean	`true` if created manually
30	`mtr_forced`	Boolean	`true` if the meter was forced
31	`vol_max`	Boolean	`true` if the maximum capacity was reached

32	`new_kmeter`	Boolean	`true` if the odometer was initialized
33	`new_hmeter`	Boolean	`true` if the hour meter was initialized
34	`local_date`	Text	Local date in the `YYYY-MM-DD` format
35	`local_time`	Text	Local time in the `HH:MM:SS` format
36	`line_id`	Integer	Consecutive integer between 0 and 999999999 replacing `id` for legacy systems
37	`kdelta`	Integer	Covered distance (km or Miles) (1)
38	`kcons`	Decimal	Fuel consumption (km/L or MPG) (1)
39	`hdelta`	Decimal	Covered time (h)
40	`hcons`	Decimal	Fuel consumption (L/h)
41	`custom_price`	Decimal	Unit price assigned using the "Edit prices" window (2)
42	`tanker.id`	ID	Tanker vehicle public ID (3)
43	`tanker.name`	Text	Tanker vehicle name (labeled as "ID" in the UI) (3)
44	`tanker.badge`	Text	Tanker vehicle badge (3)
45	`tanker.code`	Text	Tanker vehicle code (3)
46	`dest_type`	Text	`tanker` if the transaction was delivered to a tanker vehicle, or `vehicle` otherwise (3)
47	`tank.id`	ID	Tank public ID
48	`tank.name`	Text	Tank name

Fields of type "ID" contain the "Public ID" for a given entity, using the rules defined in the Identifiers section of the "Vehicles and drivers import and export" chapter.
Those fields are either UUIDs or "Impexp IDs" depending on the settings for the entity.

Especially, for vehicles, the `vehicle.id` field is the "Public ID" of a vehicle, and is not to be confounded with the `vehicle.name` field. `vehicle.name` is the main field used to name a vehicle, and typically appears as the first column in the vehicles menu UI, with the label "ID" in the English version of GIR W150 .

(1) Unit depends on settings or area
(2) Only set if the "Editable price" W250 feature is enabled and if the "Editable prices" field in the Advanced / Impexp settings is not "None"
(3) Only set if the "Tanker vehicles" W250 feature is enabled

(4) If the "2 identifications per vehicle/driver" option is enabled for this vehicle/driver record, this field uses the first badge/code displayed in the vehicle/driver record

D.4 Web service /api-impexp/transac_fuels

D.4.1 URL

This web service provides access to fuel transactions on the following URL:
GET <app_url>/api-impexp/transac_fuels

`<app_url>` is the same URL you use to access the application web interface.

D.4.2 Fields

This export format use the same fields as the C4 file export, but in JSON. Additional fields are also available, the detail is available on our online documentation for the impexp API: https://apidoc-gir-w150.klervi.com/

Example of JSON data:


```
{
  "result": [
    {
      "id": "05008e00-5d00-0000-005a-005500e336f1",
      "transac_id": "338d031b-cef7-43f0-afba-dc0f1b5b76f0",
      "_deleted": false,
      "type": "int",
      "date": "2018-01-10T09:57:52Z",
      "vehicle": {
        "id": "120",
        "name": "HDW-7034",
        "badge": "",
        "code": "2324"
      },
      "driver": {
        "id": "211",
        "fstname": "Andrew",
        "name": "Nelson",
        "badge": "20000047",
        "code": ""
      },
      "department": null,
      "product": {
        "id": "1",
        "name": "GOI"
      },
      "volume": 6.70,
      "unit_price": 0.00,
      "kmeter": null,
      "hmeter": null,
      "activity": null,
```

```
      "nce_code": "",
      "site": {
        "id": "2",
        "name": "Station"
      },
      "pump": "1",
      "manual": false,
      "mtr_forced": false,
      "vol_max": false,
      "new_kmeter": false,
      "new_hmeter": false,
      "local_date": "2018-01-10",
      "local_time": "10:57:52",
      "line_id": 156,
      "kdelta": null,
      "kcons": null,
      "hdelta": null,
      "hcons": null
    },
    ...
  ],
  "more": false
}
```

Appendix E

Remote Control and Monitoring API

This chapter describes the web services available to perform remote control and monitoring on controllers.

E.1 Web services

Web services expose a REST API in JSON format.

They are available at <app_url>/api-impexp/, where <app_url> is the same URL you use to access the application web interface.
HTTP methods GET, POST, PUT, and DELETE are used to perform the different operations.

Sites are available at /api-impexp/rcm/sites:

- `GET /api-impexp/rcm/sites`: Read the list of sites list
- `GET /api-impexp/rcm/sites/<id>`: Read a site

Supervision actions are available at /api-impexp/rcm:

- `POST /api-impexp/rcm/block_pump`: block a pump
- `POST /api-impexp/rcm/unblock_pump`: unblock a pump
- `POST /api-impexp/rcm/start_pump`: start a remote transaction
- `POST /api-impexp/rcm/force_refresh`: triggers a new gauging

Inventories are available at /api-impexp/inventories:

- `GET /api-impexp/inventories`: Read the inventories list (works the same as `GET /api-impexp/transac_fuels`)

E.2 Sites

This table describes the data model of sites in the `/api-impexp/rcm/sites` web service.

Name	Type	Description
`id`	ID	Site public ID
`name`	Text	Site name
`controllers[].sn`	Text	Controller S/N
`controllers[].online`	Boolean	`true` if the controller is online
`controllers[].date`	Datetime	Last time the system communicated with this controller
`tanks[].id`	ID	Tank public ID
`tanks[].name`	Text	Tank name
`tanks[].product.id`	ID	Product public ID
`tanks[].product.name`	ID	Product name
`tanks[].capacity`	Integer	Tank capacity (L or gal)
`tanks[].volume`	Decimal	Gauged volume (L or gal)
`tanks[].volume_date`	Datetime	Date and time when gauge was last read
`pumps[].id`	ID	Pump public ID
`pumps[].name`	Text	Pump name
`pumps[].num`	Text	Pump number
`pumps[].product.id`	ID	Product public ID
`pumps[].product.name`	Text	Product name
`pumps[].tank.id`	ID	Tank public ID
`pumps[].tank.name`	Text	Tank name
`pumps[].blocked`	Boolean	`true` if the pump is currently blocked
`pumps[].blocked_reason`	Text	Pump blocking reason: `supervision`, `zero_volumes`, `error` or `tank_block`
`pumps[].manual`	Boolean	`true` if the pump is currently in manual mode
`pumps[].pumping`	Boolean	`true` if the pump is currently delivering fuel, either when a transaction is in progress, or when it's in manual mode
`pumps[].transaction.date`	Datetime	Date + time when the transaction on this pump started
`pumps[].transaction.vehicle.id`	ID	Vehicle public ID
`pumps[].transaction.vehicle.name`	Text	Vehicle name or registration
`pumps[].transaction.driver.id`	ID	Driver public ID
`pumps[].transaction.driver.name`	Text	Driver name

pumps[].transaction.activity.id	ID	Activity public ID
pumps[].transaction.activity.name	Text	Activity name
pumps[].transaction.nce_code	Text	NCE code
pumps[].transaction.kmeter	Integer	Odometer (km or miles)
pumps[].transaction.hmeter	Decimal	Meter in hours
accesses[].id	ID	Access public ID
accesses[].name	Text	Access name
accesses[].stay_open	Boolean	`true` if the access is currently in "stay open" mode (1)

(1): only for access-only licenses when the *Zones* feature is enabled

E.3 Inventories

This table describes the data model of inventories in the `/api-impexp/inventories` web service.

Name	Type	Description
id	ID	Inventory public ID
date	Datetime	Date + time in UTC
site.id	ID	Site public ID
site.name	Text	Site name
tank.id	ID	Tank public ID
tank.name	Text	Tank name
volume	Decimal	Gauged volume (L or gal)
temperature	Decimal	Gauged temperature (°C)

E.4 Supervision actions

This section describes the detail of the requests to perform supervision actions. All supervision actions web services are POST requests. On success, the HTTP status code is 200, and the response of those actions is just `{}`.

E.4.1 POST /api-impexp/rcm/block_pump

Name	Type	Description
pump	ID	Pump public ID

E.4.2 POST /api-impexp/rcm/unblock_pump

Name	Type	Description
pump	ID	Pump public ID

E.4.3 POST /api-impexp/rcm/start_pump

Name	Type	Description
pump	ID	Pump public ID
vehicle	ID	Vehicle public ID
driver	ID	Driver public ID
kmeter	Integer	Odometer (km or Miles)
hmeter	Decimal	Meter in hours
activity	ID	Activity public ID
nce_code	Text	NCE code

E.4.4 POST /api-impexp/rcm/force_refresh

Name	Type	Description
pump	ID	Site public ID

E.5 Examples

E.5.1 Get the status of a site

Request:

```
GET /api-impexp/rcm/sites/bfb3505b-9426-4c21-98e0-2803802d442e
```

Response:

```
{
  "result": {
    "id": "bfb3505b-9426-4c21-98e0-2803802d442e",
    "name": "Station",
    "controllers": [
      {
```

```
      "sn": "001348000000,
      "online": false,
      "date": "2020-09-04T09:07:10.941871Z"
    }
  ],
  "tanks": [
    {
      "id": "019b1733-078e-466d-a777-4bf598905272,
      "name": "Station T1 DIESEL",
      "product": {
        "id": "141da8b9-5755-4467-8c4b-ecaddd7126c5,
        "name": "DIESEL"
      },
      "capacity": 10000,
      "volume": 4400,
      "volume_date": "2020-08-28T12:02:42Z"
    }
  ],
  "pumps": [
    {
      "id": "b41024e5-7a6b-0b64-dde3-1f03ccb1cd5b",
      "name": "P1,
      "num": "1,
      "product": {
        "id": "141da8b9-5755-4467-8c4b-ecaddd7126c5,
```

```
          "name": "DIESEL"
        },
        "tank": {
          "id": "019b1733-078e-466d-a777-4bf598905272,
          "name": "Station T1 DIESEL"
        },
        "blocked": false,
        "manual": false,
        "pumping": false,
        "blocked_reason": "",
        "transaction": null
      }
    ]
  }
}
```


E.5.2 Block a pump

Request:

```
POST /api-impexp/rcm/block_pump
{
  "pump": "b41024e5-7a6b-0b64-dde3-1f03ccb1cd5b"
}
```

Response:

```
{}
```

E.5.3 Unblock a pump

Request:

```
POST /api-impexp/rcm/unblock_pump

{

  "pump": "b41024e5-7a6b-0b64-dde3-1f03ccb1cd5b"

}
```

Response:

```
{}
```

E.5.4 Start a remote transaction

Request:

```
POST /api-impexp/rcm/start_pump

{

  "pump": "b41024e5-7a6b-0b64-dde3-1f03ccb1cd5b",

  "vehicle": "fb7e78b1-9005-49b5-96cf-a5071177505a",

  "driver": "5d49d014-1bd7-49f8-851d-92eaa44ad112

}
```

Response:

```
{}
```

E.5.5 Trigger a new gauging

Request:

```
POST /api-impexp/rcm/force_refresh
```

```
{
  "site": "bfb3505b-9426-4c21-98e0-2803802d442e"
}
```

Response:

```
{}
```

E.5.6 Fetch the first inventories

Request:

```
GET /api-impexp/inventories
```

Response:

```
{
  "result": [
    {
      "id": "22d8c15f-e4af-4a58-9178-eabafd6d1fb0,
      "date": "2018-06-14T07:40:05Z",
      "site": {
        "id": "bfb3505b-9426-4c21-98e0-2803802d442e",
        "name": "Station"
      },
      "tank": {
        "id": "141da8b9-5755-4467-8c4b-ecaddd7126c5,
        "name": "Station T1 DIESEL"
      },
      "volume": 20238,
```

```
      "temperature": 16.3
    },
    ...
    {
      "id": c58709c9-d4f2-49e5-ac1e-da9d35652722,
      ...
    }
  ],
  "more": true
}
```

E.5.7 Get the next inventories (after `c58709c9-d4f2-49e5-ac1e-da9d35652722`)

Request:

```
GET /api-impexp/inventories?last_id=c58709c9-d4f2-49e5-ac1e-da9d35652722
```

Response:

```
{
  "result": [
    ...
  ],
  "more": true
}
```