



User & Technical Guide V.1.15

Hardware V-1.04



Terminal Serial Number

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Installed by (Company):

.....

Customer Name:

.....

Site Name:

.....

User & Technical Guide V.1.15

Hardware V-1.04

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Section 1: User Guide

Please read this User Guide to get the best use of your terminal.
If you have any further questions or comments, please contact
the company that has installed this equipment for you.

Purpose:

The terminal serves a two-fold purpose:

- To control access to a fuel pump by means of contactless tags and Virtual Tags (Pin Only Access).
- To register dispensed fuel for individual vehicles and/or drivers, and get an overview of the vehicles' economy.

In order to achieve this, the terminal is hooked up to the pump, controlling it and measuring the volume of the dispensed fuel. Each fuel transaction is saved in the terminal's memory. A batch of transactions can be transferred to a USB stick, then uploaded to the **iPETRO** website for presentation and further processing.

Tags and V-Tags:

Access to the fuel pump via the terminal is gained by means of a contactless tag. These are high security RFID tags, where only the tag's ID is read. Only tags provided by **PETRO INDUSTRIAL** may be used. Each tag can be set up on the **iPETRO** website with a PIN code and prompts for odometer, vehicle number and/or driver number.

However, access can also be gained without the use of a physical tag, but by means of PIN alone. In that case a 'virtual' tag (V-Tag) is assigned to the user together with a PIN code. Both physical and virtual tags can be set up together on the same terminal. All the V-Tags must have different PIN codes, since the tag is only identified by its PIN, but a physical tag can have any PIN code, even the same as another tag's PIN, physical or virtual. See the section 'Using **iPETRO** To Set Up **iPETRO**Lite Terminal' for further details.

Cleaning:



- Only use a damp cloth when cleaning the terminal.
- Only use detergent with a middle pH value.
- Do not use high pressure wash on the terminal.

Fuelling:

Please note that in the following example the display shows two pumps - the **iPETRO**Lite may only have one pump setup. In case two pumps are set up, these can run at the same time independently of each other.

1. When the terminal is ready for drawing fuel, the first line of the display shows 'Read tag', 'Enter PIN:' or 'Enter PIN / Read tag', depending on the presence of physical and/or virtual tags in the tag list. The second line shows the dispensed fuel volume for the current or last fuelling on the pumps:

```
Read tag
1:0.00 Lit    2:0:00 Lit
```

Or...

```
Enter PIN:
1:0.00 Lit    2:0:00 Lit
```

Or...

```
Enter PIN / Read tag
1:0.00 Lit    2:0:00 Lit
```

2. In the case of using a virtual tag, simply start by entering the PIN code. In the case of using a physical tag, place the tag close to the wireless reader on the terminal . The tag number will be shown on the second line, and on the first line, you will be prompted for information, depending on how the tag is set up.

3. In this example, user is prompted for all possible information (pin, odometer, vehicle and driver). First, enter the PIN code, followed by Enter:

```
Enter PIN: _
Tag: 1627033822
```

4. Enter the vehicle's odometer, followed by Enter:

```
Enter odometer: _
Tag:1627033822
```

5. Enter the vehicle number (e.g. it's registration number), followed by Enter:

```
Enter vehicle: _
Tag:1627033822
```

6. Enter the driver's name, followed by Enter:

```
Enter driver: _
Tag:1627033822
```

7. Finally, if two pumps are available, choose pump number, followed by Enter:

```
Choose pump (1,2) : _
Tag:1627033822
```

8. The pump is now ready for fuelling. The display will show this text for 5 seconds, but fuelling can commence straight away:

```
Pump ready:1
Tag:1627033822
```

9. When the nozzle for the chosen pump is lifted, the fuel pump motor will start, the pump number chosen will flash on the display, and the fuelled volume will be shown as fuel is dispensed:

```
Read tag
1:1.20 Lit    2:0:00 Lit
```

When the nozzle is returned, the fuel pump motor stops, and a resulting transaction of type F (for Fuel) will be saved in the internal datastore in the current transaction batch. The transaction contains all the relevant information about the fuelling: Date and time, transaction number and type, tag number, pump number, product code, volume in 1/100 units, volume unit, odometer, vehicle number and driver name. On the display the pump number stops flashing and the volume shown is the actual volume of the saved transaction.

Note: In case the power to the terminal is cut during fuelling, the last registered volume is saved temporarily in the datastore. When power is restored to the terminal, the registered volume is also restored, the fuelling is terminated and the resulting transaction is saved in the datastore as per normal. Hence, no fuel goes unregistered because of a power cut.

Error Messages:

When the tag is read, the following error situations could occur, and the text is shown on the first line of the display:

1. The tag list contains errors or is not sorted.

Tag list error
Tag:1627033822

2. The tag is not found in the tag list:

Tag not allowed!
Tag:1627033822

3. The tag is barred for a time due to entering the wrong PIN 3 times in a row.

Tag is barred!
Tag:1627033822

4. All pumps are busy.

No pumps available!
Tag:1627033822

5. Error in the PIN setup for the tag:

Wrong PIN setup!
Tag:1627033822

6. No more space in the current transaction batch (max. 2000 transactions):

Data store full
Tag:1627033822

7. Internal error in the datastore.
No fuelling is allowed till the data store has been re-formatted:

Data store error
Tag:1627033822

8. The internal real time clock is faulty.
No fuelling is allowed till it's fixed.

Real time clock error
Tag:1627033822

9. Too many zero-volume transactions in succession. This number is settable.
A power-cycle will get the terminal out of this state:

Zero-stop!
Tag:1627033822

During the pin entry, the following errors can occur:

1. Enter is pressed before 4 digits have been entered.

Too few digits!
Tag:1627033822

2. The PIN is wrong.

Wrong PIN!
Tag:1627033822

3. The tag is barred for x minutes after the wrong PIN has been entered 3 times in a row. This timeout can be set up via the website.

Tag is barred for x min
Tag:1627033822

Various available information:

When the terminal is idle, i.e. when the welcome text “Read tag” is shown, it’s possible to obtain various information about the terminal by pressing the Enter button. If only Enter is pressed, the display will show the information for only 2 seconds. If another button is pressed within the 2 seconds, the information is shown for 4 minutes. By pressing the arrow-up and arrow-down buttons, you can scroll through the available information screens. These are the screens:

```
Sapphire Lite V-2.08 ddk
F17EE1E0 Term-ID:11
```

Product name, software version and model
Software checksum and terminal ID

```
S/N:123456 Agent:987654
IMEI:863835028210669
```

Terminal serial number and agent ID
International Mobile Equipment Identity of the modem

```
P1 O1 UL p27.4 Z10 S0 C0
T1 Pt900 Pc120 Pn120
```

Pump 1, product, unit, pulses/unit, zero-stop, suspect pulses on/off, current sensor on/off
Tank number, max. pump time, pump chosen timeout and no flow timeout

```
P2 O2 UL p100 Z10 S0 C0
T2 Pt900 Pc120 Pn120
```

Pump 2, product, unit, pulses/unit, zero-stop, suspect pulses on/off, current sensor on/off
Tank number, max. pump time, pump chosen timeout and no flow timeout

```
T:OLE 1.01 111 111
1:1/5000 2:2/10000
```

Tank gauge type, software version and status flags for tank 1 and 2 (open, volume, enabled)
Tank 1, ID and volume, tank 2, ID and volume

Transferring data with USB:

The **iPETRO** USB stick is used to transfer data between the **iPETRO**Lite terminal, and an internet connected PC. Please note that only a USB stick supplied from **PETRO INDUSTRIAL** will work. The data transferred are typically transactions, receipts, tag information and terminal setup.

Data is stored on the terminal until it has received a read-receipt from the **iPETRO** website. This ensures that no transactions are lost in the synchronization process, even if the USB is damaged.



Placing USB stick on PC:

- Insert the USB stick into your internet connected Windows computer.
- Then start the synchronization program placed on the USB stick.
- Click the "Synchronize data" button to start synchronizing.
- Transactions from the USB stick are now transferred to **iPETRO** and a receipt for successful upload is written back to the USB stick, along with tag information and any changes in setup of terminal.

Placing USB stick on **iPETRO**Lite Terminal:

- Insert the USB stick into the **iPETRO**Lite terminal and the synchronization will happen automatically.
- If possible, the open batch is closed and transferred to the USB stick, unless it is already on the USB stick. Please note that only one batch is synchronized at a time, so always synchronize on the PC after synchronization on the terminal.
- In case a newer version of the software is available, the terminal will ask if it is ok to upgrade this.

Transferring data via built-in modem (online versions only)

The online version of Sapphire Lite synchronizes with Connect via a built-in 3G modem (UC15). This means that the USB function is disabled and USB sticks cannot be used on the terminal. However, when upgrading a USB terminal to online, the USB stick is used once after the upgrade has been done on Connect. A synchronization transfers pretty much the same data as done via a USB stick.

The terminal will automatically synchronize with Connect once a day at the time set in the setup menu under 'Set sync interval' (see the sub-heading 'Setting the sync interval' in the 'Menu System' section). The synchronization is only done while the terminal is idle, so any scheduled synchronization is postponed until ongoing transactions and user interactions have completed. During the synchronization no transactions can be started. A synchronization takes about 1 minute, depending on data load and connection speed. The display will show the progress of the synchronization, including mobile signal strength, and any errors encountered along the way.

The terminal will ping the Connect server once every 15 minutes. This takes only 10-12 seconds. During this time no transactions can be started. This also means that a ping is postponed until ongoing transactions and user interactions have completed. The display will show the progress of the ping and any errors encountered along the way. Normal scheduled pings do not show the mobile signal strength on the display. However, by holding down the P button for 2 seconds till another beep is heard, a ping is forced to be sent, and then the signal strength is shown on the display. This is handy, since it enables the user to check the quality of the mobile connection any time.

The pings also enable the terminal to receive commands from the Connect server. For example, when the user clicks the Emergency Sync button on Connect, the terminal is alerted to this via a ping. Thus, the terminal will synchronize straight after receiving the ping.

Transferring data via built-in modem (online versions only) continued...

The following is a list of potential errors displayed in connection with pings and synchronizations. Note, these error texts are only in English:

"No modem"	The terminal does not detect any modem.
"APN missing"	The APN has not been set or is missing.
"Factory set"	The modem factory settings could not be invoked.
"SW vers"	The modem software version could not be read.
"IMEI"	The modem's International Mobile Equipment Identity (IMEI) could not be read.
"Auto SIM"	The auto-SIM detection mode could not be invoked.
"SIM not detected"	No SIM is detected.
"IMSI"	The SIM's International Mobile Subscriber Identity (IMSI) could not be read.
"SIM not ready"	The SIM is not ready yet.
"Attach network"	Unable to attach to a network.1
"Register network"	Network registration error.1
"Network not registered"	General Packet Radio Service (GPRS) registration error.1
"Signal too weak"	The mobile data signal is too weak for transmission.
"Set APN"	Error in setting the APN, error in APN format.2
"Network err, wrong APN?"	Open GPRS context error, likely due to wrong APN.2
"Query context"	Query GPRS context error.
"Bind bearer"	HTTP config context ID error.
"Set URL"	Syntax error in URL.
"Set content"	HTTP config content error.
"Init send"	HTTP init POST error.
"No response"	HTTP POST setup received no response.
"No POST result"	HTTP POST command received no response.3
"Fail:<HTTP error>"	HTTP POST command failed with the stated error code.3
"Close context"	Error in closing GPRS context.
"Detach network"	Error in detaching from network.
"CME ERROR: <code>"	General error code.4

Transferring data via built-in modem (online versions only) continued...

Error Notes:

Note 1:

The requested network cannot be reached. This could have one of the following causes: A. The modem is too far away from the service provider's mobile tower. B. The modem's frequencies are not supported by the service provider's mobile tower. Try a SIM from another service provider. Or use another modem (UC15-A for UMTS 850/1900MHz or UC15-E for UMTS 900/2100MHz).

Note 2:

Please look up on the Internet the Access Point Name details for the SIM. This is different from service provider to service provider. Also, make sure the format of the entered APN in the setup is correct. See the sub-heading "Setting the APN" in the section "Menu System".

Note 3:

These errors are most likely caused by a wrong URL. The default URL is <http://mcs-connect.com>. The following is a list of common HTTP error codes:

- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error
- 502 Bad Gateway
- 503 Service Unavailable
- 504 Gateway Timeout

Transferring data via built-in modem (online versions only) continued...

Error Notes Continued:

Note 4:

In some cases the modem returns a more detailed error code. The following is a list of common CME error codes:

14,512	SIM busy or not ready	312	PH SIM pin necessary	707	HTTP network open fail
20,322	Memory full	313	SIM failure	708	HTTP network no config
23,320	Memory failure	314	SIM busy	709	HTTP network deactivated
30,331	No network service (has the same cause as in note 1)	315	SIM wrong	710	HTTP network error
31,332	Network timeout	316	SIM PUK required	711	HTTP URL error
32	Network not allowed	317	SIM PIN2 required	712	HTTP empty URL
40	Network personalization PIN required	318	SIM PUK2 required	713	HTTP IP address error
41	Network personalization PUK required	500	Unknown	714	HTTP DNS error
42	Network subset personalization PIN required	517	Invalid service mode	715	HTTP socket create error
43	Network subset personalization PUK required	530	GPRS is suspended	716	HTTP socket connect error
44	Service provider personalization PIN required	531	Mobile Equipment storage full	717	HTTP socket read error
45	Service provider personalization PUK required	701	HTTP unknown error	718	HTTP socket write error
46	Corporate personalization PIN required	702	HTTP timeout	719	HTTP socket close
47	Corporate personalization PUK required	703	HTTP busy	720	HTTP data encode error
300	Mobile Equipment failure	704	HTTP UART busy	721	HTTP data decode error
310	SIM not inserted	705	HTTP no get/post request	722	HTTP read timeout
311	SIM pin necessary	706	HTTP network busy	723	HTTP response fail

Override Transactions

The **iPETRO**Lite can be set up for override transactions.

When override transactions are enabled, the pumps are authorized all the time, ready to draw fuel, without using a tag.

Any fuelling done in override transactions mode will be saved under tag number 0000000000 and type 'O' (for Override). To enable the override mode the switch inside the terminal must be set in the "up" position (see right image) and the feature must be enabled within the **iPETRO** website, this can be found on the Site Page just below the status box (see image below).

Note: When the override is enabled on the terminal the display will show "Manual Override" on the first line. To disable, move the switch to "down" position.



Switch in 'Up' position

Override is now enabled.
Display text: "Manual Override"



Switch in 'Down' position

Override is now disabled.
Display text: "Read tag"





iPETRO Website Overview

The following pages summarise common
usage of the **iPETRO** system



iPETRO Website Overview:

Home page:

The first page when logging on to the **iPETRO** website is the "Home" page. A graphical presentation of transactions over time is shown here. This can be filtered by product and date.

Graphical data may be printed or exported by using the buttons located in the upper right of the graph frame.

Click the downloads tab to download user guides and specification sheets

View other products in the **PETRO INDUSTRIAL** range by clicking on the 'Other Products' button.

iPETRO Website Overview:

Tags page:

The Tags page shows all tags and V-Tags (V-Tags require only the specified pin to be entered by the user to access fuelling). Changing details like Tag Name, Vehicle, Pin code etc. is simply done by editing the data in the overview.

Deactivate a tag or multiple tags (or Vtags) by unclicking the status box within the status column.

When creating or changing pin numbers they can be any combination of 4 digits, except for V-Tags (Virtual Tags) where pin number must be unique.

The list of tags is available to download as an excel spreadsheet via the download button.

Note: Tags assigned to a customer are not site-specific i.e. all tags can be used on all sites the customer has set up, and are not restricted to just one site.



The screenshot shows the iPETRO website interface. At the top, there is a navigation bar with links: Home, Transactions, Sites/Stocks, and Tags. The 'Tags' link is highlighted. Below the navigation bar, there are three main icons: a truck (highlighted with a red box), a location pin, and a clock. The main content area is titled 'Tags' and shows a table of tags. The table has columns: Tag No., Tag Name, Vehicle/Driver Name, Pin, Pincode Vehicle, Pincode Customer, Pincode Driver, and Status. Below the table, there is a 'Download XLS' button. At the bottom, there is a form to create or edit a tag, with fields for Tag No., Tag Name, Vehicle/Driver Name, and a Method dropdown menu.

Tag No.	Tag Name	Vehicle/Driver Name	Pin	Pincode Vehicle	Pincode Customer	Pincode Driver	Status
0210333312	Simple Tag	Detona Morales		0	0	0	0
1210140079	TAG 1	WILLIAM	1234	0	0	0	0
1220170075	TAG 2	Ritcher Colberg	2407	0	0	0	0
0734200008	TAG 4	Tia Castille	1234	0	0	0	0
P101000002	TAG 5	Reynold Hughes	1422	0	0	0	0
0210410014	TAG 6	Diana Phyllis	8888	0	0	0	0
0000470010	TAG 7	JIM 12 432	1234	0	0	0	0
0000410012	TAG 8	WB 12 K34	8123	0	0	0	0
0421437344	TAG 9	Spine	0000	0	0	0	0
0500250021	TAG 10	Spine	8888	0	0	0	0
P101000001	TAG 11	Andy Board	1234	0	0	0	0

Download XLS

Tag No. Tag Name Vehicle/Driver Name Method

Update Record



iPETRO FLUIDS MANAGEMENT

Home | Transactions | Stock/Checks | Tags | Transport Ltd

Downloads | Other Products

Sites

Displaying 1 to 2 of 2

Site Number	Site Name	Last Time	Last Sync	Status
1	Chem Site 1	1 Apr 2016, 9:03 a.m.	1 Apr 2016, 9:03 a.m.	
3	Chem Site 2	1 Apr 2016, 9:03 a.m.	1 Apr 2016, 9:03 a.m.	
25	Test Site 1	1 Apr 2016, 9:03 a.m.	1 Apr 2016, 9:03 a.m.	

From Date: From Time: To Date: To Time:

[Get Stock Levels](#)

Translations | Content | Downloads | Support | Login | Logout

www.iPETRO.com

iPETRO Website Overview:

Site List page:

The Site List page shows all sites and the details on them, like when they were last synced.

A basic stock level report showing the calculated stock figure, can be generated from the bottom of the page.

By clicking the 'Get Stock Levels' button this will generate a stock reconciliation spreadsheet that highlights issues such as stock losses etc.

This spreadsheet will be generated using your manual dip reads for calculated stock or if the system has a tank gauge installed, readings for actual stock.

iPETRO Website Overview:

Site Page:

When choosing a site, the Site page shows the details for a specific site, including stock information like current estimated level, dip reads and deliveries.

By clicking the 'Add Dip' or 'Add Delivery' buttons located next to the Tank Estimated Level Gauge, you can Easily enter dip readings and delivery amounts against specific dates/times.

Deliveries, dip readings and transactions can be edited or amended in the lower part of the site page by clicking on the pencil icon in the relevant row.

Note: As mentioned on page 09, the manual override is set from the site page.

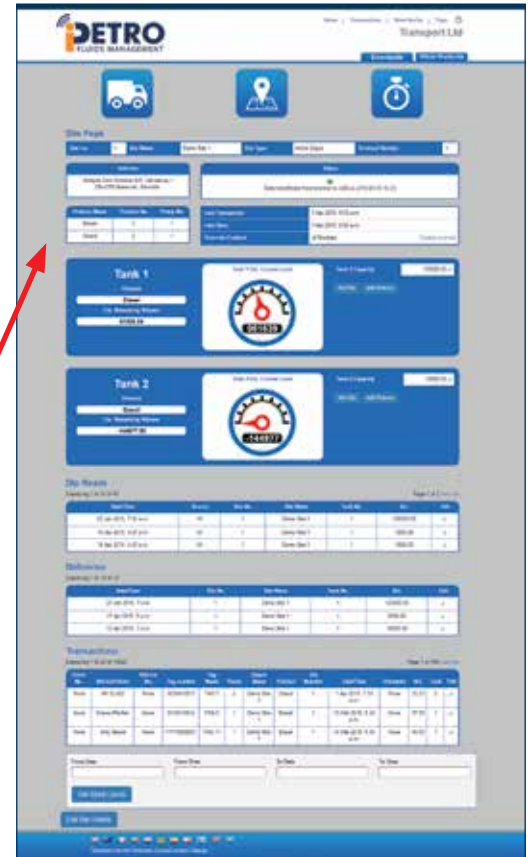
Data transferred from terminal to USB on 2016-03-10 16:22

Last Transaction	12 Apr 2016, 0:02 a.m
Last Sync	12 Apr 2016, 8:03 a.m
Override: Enabled	☒ Enabled Disable override

Tank 1 Est. Current Level

Tank 1 Capacity

100000.00



Site Page

Site Name

Site Address

Site Phone

Site Email

Site Website

Site Manager

Site Supervisor

Site Operator

Tank 1

Estimated Level

100000.00

Add Dip

Add Delivery

Tank 2

Estimated Level

100000.00

Add Dip

Add Delivery

Dip Reads

Date	Time	Level	Unit	By	Notes
12 Apr 2016	0:02 a.m	100000.00	L	1	
12 Apr 2016	8:03 a.m	100000.00	L	1	
12 Apr 2016	16:22	100000.00	L	1	

Deliveries

Date	Time	Amount	Unit	By	Notes
12 Apr 2016	0:02 a.m	100000.00	L	1	
12 Apr 2016	8:03 a.m	100000.00	L	1	
12 Apr 2016	16:22	100000.00	L	1	

Transactions

Date	Time	Amount	Unit	By	Notes
12 Apr 2016	0:02 a.m	100000.00	L	1	
12 Apr 2016	8:03 a.m	100000.00	L	1	
12 Apr 2016	16:22	100000.00	L	1	

20



Transactions

Logging in 11:29 AM 2016 Page 1 of 1 (1000)

Driver No.	Vehicle/Driver	Vehicle No.	Tag number	Tag Name	Pump	Depot Name	Product	Site	Date/Time	Customer	Vol	Tank	Bill
None	YMC000001	None	421014010	TAG 1	1	Depot Site 1	Derail	2	29-Mar-2016, 7:57 AM	None	91.59	1	✓
None	Tra Carilla	None	3714502936	TAG 4	1	Depot Site 2	Derail	2	29-Mar-2016, 7:44 AM	None	91.59	1	✓
None	Chemo/Puffin	None	10710410014	TAG 6	2	Tank Site 3	Derail	31	29-Mar-2016, 3:14 AM	None	45.73	13	✓
None	VIS 32 SIA	None	9308410112	TAG 8	1	Depot Site 2	Derail	2	29-Mar-2016, 9:35 AM	None	99.57	6	✓

Product	Count	Volume
Derail	121	4806.27
Crack	79	9368.02

Download XLS Download CSV Print Report

Period: Last 24 Hours Default Report: Last 24 Hours From Date: To Date: Site: All Sites Product: All Products Vehicle Number: Driver Number: Tag Number: All Tags Tag Name: All Tags Vehicle / Driver Name: Tag Type: All Tags Update Search

Language | Contact Us | Feedback | Change

iPETRO Website Overview:

Transactions Page:

The transaction page shows transactions based on the filters below the grid.

Transactions can be downloaded as XLS and CSV files, or simply be printed out using the Print Report button.

The default report can be set to the last download. This will automatically show the latest transactions downloaded from the usb when you enter the transactions screen.

iPETRO Website Overview:

Edit Transaction Display:

When clicking the Cogwheel menu on upper right side of the page, the Edit Transaction Display is available. This page changes what columns show in the transaction page, what the columns are called, and how long the fields are when exporting to CSV.

The drag and drop facility can be used to re-order the columns.

The lower part of this screen also allows for column names and field lengths to be edited to create fully customised csv and printable reports specific to the users requirements.

Note: Dependant on user level there will be other options in the 'cog-wheel dropdown menu: Edit users (available on managers logins) and 'Change Password' (available to all users).



The screenshot shows the 'Edit Transaction Table Columns' interface in the iPETRO Fluids Management system. The interface is divided into two main sections: 'Active Fields' and 'Hidden Fields'. The 'Active Fields' section contains a list of fields that are currently displayed in the transaction table, including 'Transaction ID', 'Site ID', 'Site Name', 'Tag Number', 'Product Name', 'Product Code', 'Operator Code', 'Pump Code', 'Wellbore Code', 'Well Name', and 'Well Type'. The 'Hidden Fields' section contains a list of fields that are currently hidden, including 'Site ID', 'Site Name', 'Tag Number', 'Product Name', 'Product Code', 'Operator Code', 'Pump Code', 'Wellbore Code', 'Well Name', and 'Well Type'. Below these sections, there are input fields for editing the column names and lengths for each field. The interface also includes a 'Save' button at the bottom left and a 'Cogwheel' menu icon in the top right corner, which is highlighted with a red box. The Cogwheel menu contains options for 'Edit Transaction Display', 'Logins', 'Export Data', and 'Print Reports'.

Frequently asked questions:

Why is my tag not working?

If the tag is read and shown on the display, the tag may not be in the tag list on the terminal. Check that the tag is set as Active on **iPETRO**, synchronise the USB stick on **iPETRO**, then on the terminal.

If the terminal is in Manual Override mode, no tags can be read.

If other tags can be read, the tag could simply be faulty and a new tag should be issued.

If no tags can be read, replace the tag reader.

How do I get a new tag?

Extra tags should be ordered through the company who have installed your **iPETRO** Lite.

Why does the assigned USB-stick not work?

If the display says 'USB read error!', the stick could be faulty or the contacts on the reader and /or on the stick could be dirty.

If the display says 'USB-stick volume error!', the stick has an internal error. Please order a new one.

Why does my own USB-stick not work?

As a security measure, to prevent other people from tampering with your **iPETRO** Lite terminal, only USB sticks supplied from **PETRO INDUSTRIAL** and assigned to the terminal will work on it.

How do I get a new USB-stick?

Extra USB-sticks should be ordered through the company who have installed your **iPETROLite**.

I don't understand the error message on the terminal!

Please look through the list of error messages in this user guide. If that does not help you, contact the company who has installed your **iPETROLite**.

Notes:



Section 2: Technical Guide

Please note that this section is intended
for distributors and resellers only.

Agent Quick Guide:

How to setup an **iPETROLite**:

- 1 Login to PETRO INDUSTRIAL-iPETRO.com
- 2 Add Site (See page 22 “Using **iPETRO** To Set Up **iPETROLite** Terminal - Add Site”)
This assigns the terminal to a site for a new or existing customer. Make sure you select the terminal with the correct serial number.
- 3 Assign USB stick to site (See page 23 “Assign Tags/ V-Tags/ USB”)
- 4 Assign Tags to customer (See page 23 “Assign Tags/ V-Tags/ USB”)
- 5 Set up terminal (See page 25 “Menu System”)
Make sure that:
 - a. Terminal no matches what is on **iPETRO** under the site
 - b. Product numbers on pumps matches what is on **iPETRO** under the site.
- 6 Use The USB stick to transfer Tags to terminal by (See page 8 “Transferring data with USB”)
 - a. Plug USB into PC and sync with **iPETRO**
 - b. Plug USB into **iPETROLite**

Note: If at this stage the display says ‘Conf err! (L:1,F:X)’; the most likely explanation is that the terminal ID in the terminal doesn’t match that on **iPETRO**.

- 7 Now terminal is set up, and tags should work
- Carry out a test transaction.
- 8 Use The USB stick to transfer transactions to **iPETRO** by:
(See page 8 “Transferring data with USB”)
 - a. Plug USB into **iPETROLite**
 - b. Plug USB into PC and sync with **iPETRO**

Note: If you encounter the error ‘Cannot Find Product’ or ‘Cannot Parse Payload’, the most likely cause is that transactions on the terminal have been made on a product code or a pump number that doesn’t exist in **iPETRO**. Installers sometimes make the mistake of doing a few test transactions and then change the product code to the one set up on **iPETRO**, but then the test transactions won’t be accepted. Contact the installer for advice.
- 9 Check that the transactions are now showing correctly on **iPETRO** for the customer (See page 15 “Transactions Page”)
- 10 Add a customer login (See page 17 “Managing Users”)

Please note that once the USB stick starts to sync back and forth between the **iPETROLite** and **iPETRO** website it will contain a number of files. We are working on hiding these files from the user to make it more user friendly. Use the “Start” shortcut with this icon to launch the sync program.

Agent Quick Guide:

How to resell a **iPETROLite**:

- 1 Login to PETRO INDUSTRIAL-iPETRO.com.

In the top right corner you can click the cog menu, the subsequent menu will offer a number of options:



PETRO INDUSTRIAL can create your resellers in **iPETRO**, so you can forward items from your stock to the resellers stock.

The main steps needed to assign items are:

- 2 "Assign Terminals"
This moves the terminal(s) from your stock to your resellers stock.
- 3 "Assign Tags"
This moves the Tag(s) from your stock to your resellers stock.

- 4 "Assign USB"

This moves the USB(s) from your stock to your resellers stock.

Once Terminals, Tags and USBs are in resellers stock, the reseller can set everything up independent of you as an individual agent.

In addition to the 3 main operating components (Terminals, Tags & USB) stock upgrades for additional functionality can now be assigned to your resellers. These upgrades include V-Tags for pin only access (See pg 23), Pump upgrades and Tank Gauging (See pg 37-40).

Assigning upgrades to a reseller is carried out via the cogwheel.

See below the interface for reassigning pump upgrades - in this instance the user is assigning 1 pump upgrade to the 'Test PETRO INDUSTRIAL Reseller'.



Using iPETRO To Set Up iPETROLite Terminal

Add site:

When setting up a iPETROLite the first thing that should be done is adding a site. This is achieved via the Cogwheel menu in the top right corner of the screen.

The steps involved when setting up a site is:

- Select the terminal
- Select existing customer or add new
- Input site details
- Choose upgrades if wanted (pump upgrade for two pumps, tank gauge upgrade)
- Setup tanks and “products”



The screenshot shows the iPETRO FLUIDS MANAGEMENT software interface. At the top, there is a navigation bar with the iPETRO logo and a 'Cogwheel' menu icon. Below the navigation bar, there are several input fields for site information:

- Pending terminal:** A dropdown menu with 'Terminal-00000000' selected.
- Customer:** A dropdown menu with 'Add new customer' selected.
- New customer name:** A text input field with 'New Customer' below it.
- Address:** A large text input field with 'New Customer's Address' above it.
- Site Name:** A text input field with 'Premises' below it.
- Site Number:** A text input field with '4' below it.
- Site type:** A dropdown menu with 'Home Depot' selected.
- Timezone:** A dropdown menu with 'Europe/London' selected.
- Can this terminal use software override?:** A checkbox with 'X' checked.
- Tank 1 Product:** A dropdown menu with 'Add New Product' selected.
- Tank 1 Product Name:** A text input field with 'Diesel' below it.
- Tank 1 Product Number:** A text input field with '1' below it.
- Tank 1 Pump Number:** A text input field with '1' below it.
- Tank 1 Capacity (litres):** A text input field with '20000' below it.
- Tank 2 Product:** A dropdown menu with 'Add New Product' selected.
- Tank 2 Product Name:** A text input field with 'Petrol' below it.
- Tank 2 Product Number:** A text input field with '2' below it.
- Tank 2 Pump Number:** A text input field with '1' below it.
- Tank 2 Capacity (litres):** A text input field with '6000' below it.

At the bottom left, there is a blue button labeled 'Add New Site'. At the bottom right, there is a status bar with various icons and the text 'iPETRO FLUIDS MANAGEMENT'.

Using iPETRO To Set Up iPETROLite Terminal

Assign Tags/ V-Tags/ USB:

Assigning a tag, V-Tag or USB from items in stock is simply a question of finding a the desired medium (tag, Vtag or USB) in stock, clicking or dragging it over in the “To Assign” box, choose the customer (and site if USB) and click the assign button. Items may also be assigned to a reseller if they are setup and available in the drop-down box.

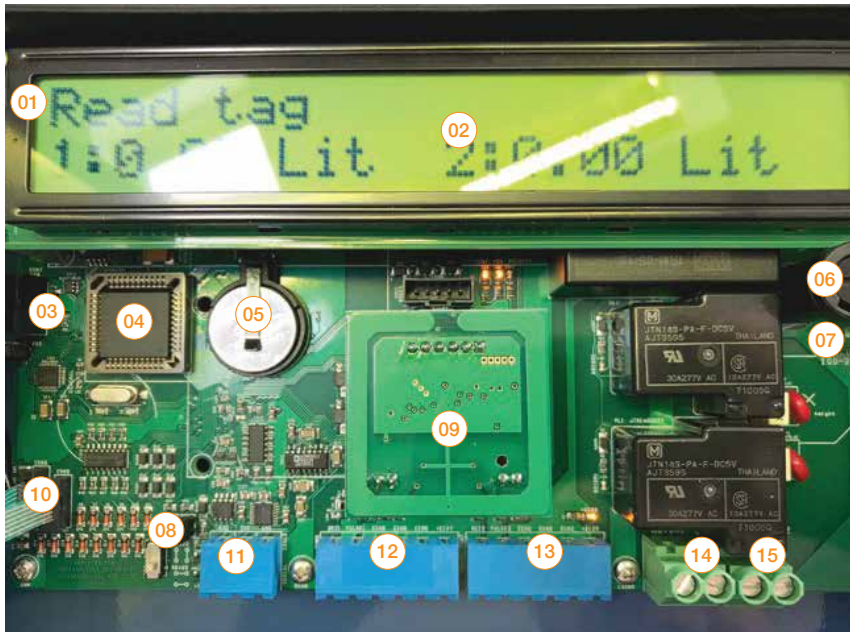
When assigning tags or V-Tags from large lists of stock, click the ‘Contactless tags only’ or ‘V-Tags Only’ button to display media relevant to that selection only.

V-Tags in the stock list are denoted by a ‘V’ prior to the item number.

Note: To support the use of V-Tags the iPETROLite terminal must be V-Tag enabled. A terminal upgrade can be purchased to allow the use of V-Tags alongside standard tags.



Overview of Components



Parts with (R) in list below are replaceable parts:

- 01. Display contrast adjuster
Display automatically adjusts contrasts according to temperature
- 02. Display (R)
- 03. Input connector for USB
- 04. CPU / Program Flash
- 05. Battery for realtime clock (R)
- 06. Fuse (R)
- 07. Mains input
- 08. Manual transaction override switch
- 09. TAG reader (R)
- 10. Input connector for keyboard
- 11. Serial port for Tank Gauge
- 12. Inputs for pump 1 + 12V optional output for pulser
- 13. Inputs for pump 2 + 12V optional output for pulser
- 14. Outputs for pump 1 motor
- 15. Outputs for pump 2 motor



CAUTION:

Only replace the battery with the same type, CR2032, and with the plus terminal facing upward!
Must only be replaced by technical personnel, not by an operator!

Menu System:

To enter the **iPETRO**Lite menu system, hold down the “Clear” button for five seconds. Now a challenge code comes up. Agents will possess a response code generator, alternatively call your agent for a response code to enter.

Challenge: 02BB2B3F
Response code: _

Once the correct response code is entered, access is granted to the following sub-menus. See the sections to follow for more information about each menu item:

Set clock	Setting of the internal real time clock
Set auto DST	Setting of auto daylight savings time (DST) adjustment
Set URL	Setting of URL for the Connect server (online versions only)
Set APN	Setting of Access Point Name (online versions only)
Set sync interval	Setting of the daily sync time (online versions only)
Do sync with Connect	Invoking a sync with Connect (online versions only)
Set language	Setting of the display language. Available are English and Danish
Set mem warning	Setting of transaction memory low warning
Set tag barred min	Setting of how long time a tag is barred after too many wrong PINs
Terminal ID	Setting of terminal ID

Pump A setup	Settings for pump A
Pump B setup	Settings for pump B
Tank setup	Settings for the attached tank gauge
Format datastore	Formatting of the internal datastore (Warning: All settings will be cleared and set to default values!)

Pressing clear again, makes it possible to clear the challenge code:

Clear challenge (Y/N) :

Doing this locks the terminal, so another challenge / response code is necessary in order to enter the menu again. If the challenge code is NOT cleared, access to the menu is granted without any code, as long as it's done within 15 minutes, after which the current challenge code expires.

Setting the Clock:

The display will show the current date and time in the first line and the day of the week and the DST adjustment in the second line:

```
Clk: 15/03-2016 16:26:56
Tuesday, standard time
```

Press Enter:

```
(YYYYMMDDHHMMSS)
Set: _
```

Now enter the date and time as indicated (year, month, date, hours, minutes, seconds) and press Enter:

```
(YYYYMMDDHHMMSS)
Set: 20160315162656
```

The date and time is now set.

Setting auto Daylight Savings Time (DST):

The terminal can adjust for DST automatically. Although there are some strange times in the world when DST is adjusted for, the terminal assumes it takes place between 2 and 3 am on a Sunday morning. This setting sets up in which month and on which Sunday the DST starts and ends.

The first setting adjusts the start month. Use arrows left and right to adjust the value:

```
→Start DST month 3
Start DST Sunday 5
```

Press arrow down to adjust the start Sunday. If DST should start on the 1st Sunday, choose 1, on the 2nd, choose 2, and so on. If DST should start on the last Sunday of the month, always choose 5, regardless of whether the last Sunday is actually the 5th. Adjust the value:

```
Start DST month 3
→Start DST Sunday 5
```

Press arrow down to adjust when DST should end:

```
Start DST Sunday 5
→End DST month 10
```

```
End DST month 10
→End DST Sunday 5
```

Scroll up and down to see if the settings are correct. Press Enter and answer Yes to have the changes saved.

Setting the URL (online versions only)

The online version is equipped with a modem. The Uniform Resource Locator (URL) setting contains the web address of the Connect server. It should be `http://mcs-connect.com`

Press Clear for each character to clear. Enter the correct URL. To change between upper case and lower case hold down the key for 2 seconds and the letter will change case. From then on all keystrokes will be in that new case, until a key is held down again for 2 seconds. This feature is also used to invoke special characters instead of the numbers and the space key. The following table shows each key and its function in upper case and lower case mode, respectively:

Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
A	a	B	b	C	c	D	d
E	e	F	f	G	g	H	h
I	i	J	j	K	k	L	l
M	m	N	n	O	o	P	p
Q	q	R	r	S	s	T	t
U	u	V	v	W	w	X	x
Y	y	Z	z	Æ	æ	Ø	ø
Å	å	<space>	.	1	'	2	"
3	?	4	:	5	%	6	-
7	/	8	_	9	=	0	,

URL: `http://mcs-connect.com_`

Press Enter when the correct URL has been entered.

Setting the APN (online versions only)

The Access Point Name (APN) details are set in this format:

<APN>,<username>,<password>,<authentication protocol>.

The <authentication protocol> must be a number from 0 to 3, having the following meaning: 0=None, 1=PAP, 2=CHAP, 3=PAP or CHAP.

Usually the Internet Service Provider (ISP) doesn't require username, password or authentication protocol, so in most cases the format would be: <APN>,,,0. Please look up on the Internet the APN for the ISP who provided the SIM card for the modem.

Press Clear for each character to clear. Enter the correct APN, username, password and authentication protocol. Changing between upper case and lower case mode is done as when setting the URL (see previous menu item).

APN: telstra.wap,,,0_

Press Enter when the correct APN has been entered.

Setting the Sync Interval (online versions only)

This setting denotes the daily time when the terminal should perform a synchronisation with Connect. The setting consists of 4 digits, denoting hour and minute in the 24-hour format. For example, 2340 means the sync will take place daily at 23:40 hours, or 11:40 pm.

Sync time (HHMM): 2340_

Press Clear for each character to clear. Enter the synchronisation time in hours and minutes, 4 digits. Press Enter.

Do Sync with Connect (online versions only)

This menu item can be used to invoke a synchronisation with Connect. The info texts shown during synchronisation are the same as when a normal scheduled sync is done at idle. See the section 'Transferring data via built-in modem' (see page 11).

Sync now (Y/N): N

Press 'Y' for Yes, or 'N' for No. Press Enter.

Setting the language:

The display will show the current language. Use arrows right and left to adjust the language, then press Enter:

```
Set language: English
```

Three settings are available: English, Danish (or Swedish) and File.

In case File is chosen, the terminal must be loaded with a valid text file beforehand, containing all the texts the terminal can display. Such a text file can be ordered from PETRO INDUSTRIAL. This means that the terminal can display any language using the Latin alphabet, but it also means that certain texts in the default languages could be altered, if so desired. For example, the text 'Enter odometer:' could be changed to 'Enter hours:'.

Setting the time in which a tag is barred:

The tag barred minutes expresses the time in which a tag is barred or blocked after the wrong PIN code has been entered too many times.

The display shows the current setting. Press Clear to clear the value and enter another value. Press Enter:

```
Tag barred min: 10_
```

Setting the memory warning:

The low memory warning expresses how many transactions there are still room for in the datastore, before a memory warning is issued, when a tag is read for fuelling.

The display shows the current setting. Press Clear to clear the value and enter another value. Press Enter:

```
Low mem. warning: 60_
```

Setting the terminal ID:

The terminal ID is a very important setting. It IDs the terminal against the USB stick. If the ID doesn't match, no synchronization with the USB stick can take place. (The error message 'Conf err! (L:1,F:X)' will appear on the terminal if this is the case).

The display shows the current setting. Press Clear to clear the value and enter another value. Press Enter:

```
Terminal ID: 11_
```

Pump settings:

The pump settings are crucial to the correct functioning of the terminal. Settings for Pump A and B can be adjusted. In the following, only settings for one pump is shown. The adjusting of the various settings are done by scrolling up and down with the arrow up and down buttons, then adjusting the chosen setting with the arrow right and left buttons. Holding down the buttons will make the values change progressively faster.

Pump number: The first setting adjusts the pump number. Use arrows left and right to adjust the value:

```
→ Pump number      1
  Product number    5
```

Product number: The product number must be the same as the number chosen on **iPETRO** for the pump. If not, any batch containing transactions with an unknown product number will be rejected. Use arrows left and right to adjust the value:

```
  Pump number      1
→ Product number    5
```

Product Unit: The product unit must match the unit set up on **iPETRO**. The range of available characters is [A..Z]. Choose L for litres. Use arrows left and right to adjust the value:

```
  Product number    5
→ Product unit      L
```

Display Unit: The display unit is the unit of the dispensed fuel shown on the display. Up to 10 characters can be entered, but in case the terminal runs two pumps, the unit will be truncated to only 3 characters per pump. Press arrow right and a cursor will appear to the right of the unit text. Press Clear to clear the setting. Enter the unit text. When small letters should be chosen, hold down the letter button, and the letter changes to a small letter. Do that again, and it changes back to a capital letter. Doing this with the numbers, alternate characters will appear: ¹2³ \$ % £ / ° €. For example, if natural gas is dispensed, the unit could be expressed in Normal Cubic Metres or Nm³. Press Enter when finished:

```
  Product unit      L
→ Display unit      Lit_
```

Max pump time: This is the maximum time in seconds in which the pump will run for. When the time is up, the transaction terminates and the pump stops. The range is [0..200000]. Use arrows left and right to adjust the value:

```
→ Display unit      Lit
  Max pump time      900
```

Pump settings:

Chosen Timeout: This is the maximum time in seconds in which the pump can be chosen. That is the time from which the pump is chosen till the nozzle is lifted and the pump is started. When the time is up, the transaction terminates with a volume of 0 litres. The range is [0..255]. Use arrows left and right to adjust the value:

```
Max pump time      900
→ Chosen timeout   120
```

No flow timeout: This is the maximum time in seconds in which no flow is detected. This is the time during fueling in which there is no flow, for whatever reason. The timeout is only applied after 10 pulses have been counted from the flow meter; before then the Chosen timeout (mentioned above) applies. When the time is up, the transaction terminates and the pump stops. The range is [0..255]. Use arrows left and right to adjust the value:

```
Chosen timeout     120
→ No flow timeout  120
```

Pulses/unit: This is the number of pulses that must be counted from the flow meter in order to get one unit of fuel (e.g. one litre). This value can have up to 3 decimal places. This is obtained by pressing the P button. For every press, the decimal point rotates to the left up to 3 decimal places and then back to none. The range of the raw value, regardless of the decimal point is [0..16383]. Use arrows left and right to adjust the value:

```
No flow timeout    120
→ Pulses/unit      10
```

Suspect Pulses: The terminal can be set up to detect pulses from the flow meter, even when a pump has NOT been authorized. So if someone manages to hardwire the power to the pump and steal fuel, at least the volume and the time it occurred can be registered. This is done by setting this value higher than 0. The value then determines the number of pulses the terminal receives before it starts a 'suspect' transaction. See the section 'All supported bowser configurations' for further details. The range for this value is [0..255]. Zero means the feature is disabled. Use arrows left and right to adjust the value:

```
Pulses/unit        10
→ Suspect pulses    0
```

Pump settings:

Zero Fillings: This is the number of transactions in succession with a volume of 0 that are allowed before the terminal will stop any further pump authorisations. Only a reboot will clear the zero fillings counter. A value of zero disables this feature. The range is [0..255]. Use arrows left and right to adjust the value:

```
Suspect pulses    0
→Zero fillings   10
```

Tank Number: This is the number of the tank attached to the pump. The range is [0..255]. Use arrows left and right to adjust the value:

```
Zero fillings     10
→Tank number      1
```

Current Sensor: When set to Yes, this setting changes the terminal's behaviour of the pump control, to cater for the use of a current sensor nozzle switch. This is a switch that closes when the current through the pump motor exceeds a certain threshold. See the section 'All supported bowser configurations' for further details. When set to No, this feature is disabled. Use arrows left and right to adjust the value:

```
Tank number       1
→Current sensor    No
```

This concludes the setup of pump A

The same procedure applies to the setup of pump B. However, in case no 2-pump upgrade has been purchased for the terminal, the display will reject an attempt to enter the pump B setup with the text:

```
No access!
```

All Supported Bowser Configurations

Should there be no nozzle signal or if in an extreme case the fuel pump is hard-wired in an attempt to steal fuel without authorisation, the fuel volumes can still be registered

The following documentation explains how to connect the bowser to the terminal and how to set it up in the agent's menu, covering all the supported combinations.

Use Tags to Authorise a Pump:

1. Nozzle signal available:

Process: Present tag, PIN, etc., choose pump. The pump relay turns on when the nozzle is lifted, the pump relay turns off and a fuel transaction is saved when the nozzle is returned.

Setup: "Current sensor" = No. The nozzle input is connected to the nozzle switch, the pulse input is connected to the flow meter, and the pump motor relay contact is connected to power in series with the pump motor (default wiring).

Display: Previous volume is shown until the nozzle is lifted, after which the volume is cleared and the pump number flashes. Fuelled volume is shown as the fuel is dispensed. Pump number and volume freeze when the nozzle is returned.

2. Nozzle signal provided via pump motor current sensor:

Process: Similar to no. 1, but when the pump is chosen, the pump relay turns on straight away. The pump relay is still on when the nozzle switch is activated. The pump relay turns off and a fuel transaction is saved when the nozzle is returned.

Setup: "Current sensor" = Yes. The nozzle input is connected to a current sensor contact switch, the pulse input is connected to the flow meter, and the pump motor relay contact is connected to power in series with the pump motor. The pump motor itself has a built-in switch, that disconnects the pump motor when the nozzle is in.

Display: Previous volume shown when the terminal is idle. When the pump is chosen, the volume is cleared and the pump number flashes. No change when the nozzle switch is activated. Fuelled volume is shown as the fuel is dispensed. Pump number and volume freeze when the nozzle is returned.

3. No nozzle signal at all:

Process: Similar to no. 2, but the transaction is completed only after no pulses have been detected for the duration of the 'No flow timeout'.

Setup: Similar to no. 2, but the nozzle input is just shorted to ground all the time.

Display: Previous volume shown when the terminal is idle. When the pump is chosen, the volume is cleared and the pump number flashes. Fuelled volume is shown as the fuel is dispensed. Pump number and volume freeze when 'No flow timeout' occurs.

All Supported Bowser Configurations continued...

Use Tags to Authorise a Pump Continued:

4. Suspect pulse detection in combination with any of the above setups:

Process: Fuel dispensed and thereby pulses detected between authorised transactions are recorded and saved as suspect transactions (S-transactions). An S-transaction ends when 'No flow timeout' occurs. While an S-transaction is in progress, the pump motor relay is NOT activated, and the pump cannot be chosen by the user either.

Setup: In addition, Suspect pulses = number of pulses at which the S-transaction begins.

Display: S-transactions are NOT revealed on the display.

Manual Override Mode:

1. Nozzle signal available:

Process: The pump relay turns on when the nozzle is lifted, the pump relay turns off and an Override transaction (O-transaction) is saved when it's returned.

Setup: "Current sensor" = No. The nozzle input is connected to the nozzle switch, the pulse input is connected to the flow meter, and the pump motor relay contact is connected to power in series with the pump motor (default wiring).

Display: Previous volume is shown until the nozzle is lifted, after which the volume is cleared and the pump number flashes. Fuelled volume is shown as the fuel is dispensed. Pump number and volume freeze when the nozzle is returned.

2. Nozzle signal provided via pump motor current sensor:

Process: The pump relay is on all the time. A transaction starts when the nozzle is out and the current sensor switch closes. The transaction completes and an O-transaction is saved when the nozzle is returned and the pump stops.

Setup: "Current sensor" = Yes. The nozzle input is connected to the current sensor contact switch, the pulse input is connected to the flow meter, and the pump motor relay contact is connected to power in series with the pump motor. The pump motor itself has a built-in switch, that disconnects the pump motor when the nozzle is in.

Display: Previous volume is shown until the pump is started, then the volume is cleared and the pump number flashes. Fuelled volume is shown as the fuel is dispensed. Pump number and volume freeze when the pump is stopped.

All Supported Bowser Configurations continued...

Manual Override Mode Continued:

3. No nozzle signal at all:

Process: Similar to no. 2, but the transaction starts after detecting 10 pulses and it completes only after no pulses have been detected for the duration of the 'No flow timeout'. After completion the internal pulse counter is cleared, thus making the terminal ready for pulse detection again.

Setup: Similar to no. 2, but the nozzle input is just shorted to ground all the time.

Display: Previous volume is shown until 10 pulses are detected, after which the pump number flashes and the fuelled volume is shown as the fuel is dispensed. Pump number and volume freeze after the transaction completes by means of the 'No flow timeout'. Fuelled volume is shown as the fuel is dispensed. Pump number and volume freeze when 'No flow timeout' occurs.

4. Suspect pulse detection; logically only works in combination with 1 and 2:

Process: Pulses detected when a transaction is not in progress, are recorded and saved as S-transactions. An S-transaction ends when the 'No flow timeout' occurs or when the nozzle switch changes position. While an S-transaction is in progress, no change to the pump motor relay contact occurs.

Setup: In addition, Suspect pulses = number of pulses at which an S-transaction begins.

Display: S-transactions are NOT revealed on the display.

Terminal – Technical Specification:

Important Installation Requirements:

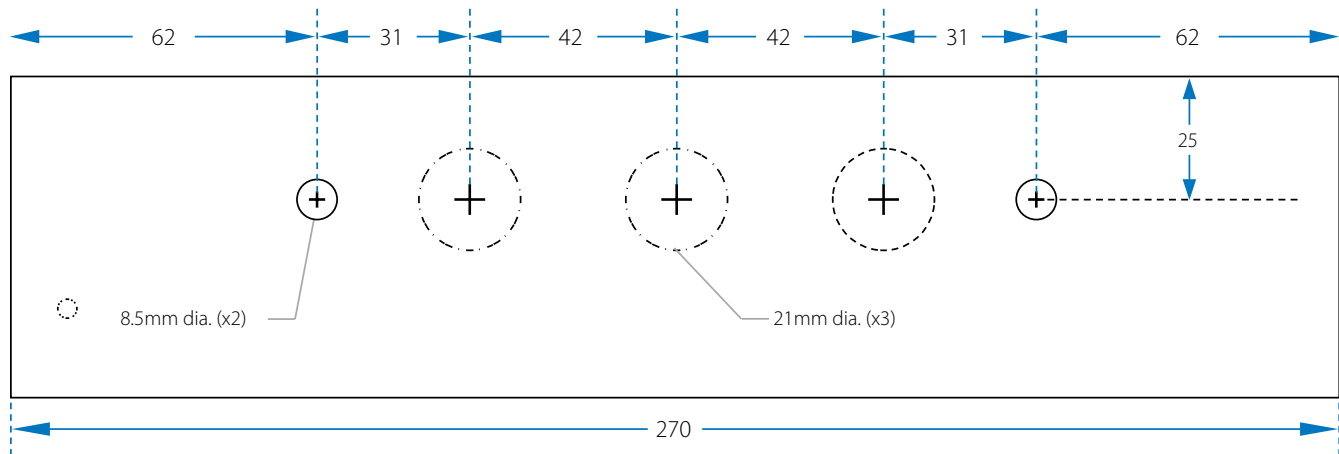
The terminal **MUST** be installed according to the requirements and regulations set out by the relevant authorities in the country in which it is to be used.

Canada: The equipment **MUST** be installed and employed in accordance with ANSI/NFPA 70, National Electrical Code® (NEC) and the Canadian Electrical Code (CEC), Part I, CSA C22.1.

Description	iPETRO Lite Spec
Dimensions	(H x W x D) 240 x 270 x 65mm
Power Supply	100–240VAC, 50-60Hz, ONE PHASE ONLY
Power Consumption, max.	15W (pump motors excluded)
Fuse	1.6A, slow
Display Type	2x24 characters dot-matrix
Display Viewing Angle	+/-40°
Tag Reader Interface Mifare	(iPETRO supplied tags)
USB Interface Version 2.0 compliant	(iPETRO supplied USB stick)
Pump Relays Current, max.	30A, resistive
Pump Relays Motor Switching, max.	1½HP @ 240VAC or ¾HP @ 120VAC
Nozzle and Pulse Input Current @ 0V	8mA
Nozzle and Pulse Input Current @ +12V	0mA
Nozzle and Pulse Input Low Voltage	0-2V
Nozzle and Pulse Input High Voltage	8-75V
Time between Pulse Input Edges, min.	300µs (e.g. square wave 1670Hz, max.)
+12V Output Current, max.	350mA
Tank Gauge Interface	RS232 or RS485
Tank Gauge Types Supported	Ocio, OLE

Mounting:

At the bottom of the case, holes are available for mounting and for cable glands. Two 8.5mm holes, one on either side, are for mounting, and the three 21mm holes in the middle are for cable glands. See this drill guide (not to scale):



FRONT

A to-scale drill guide can be downloaded here: https://mcs-connect.com/media/download_uploads/2015-07-28/Sapphire_Lite_Drill_Guide.pdf

Mounting continued:

The terminal can be mounted on a pedestal, directly on top of a bowser or on a wall, using the wall mount shown here:



Cabling



Cables going in and out of the terminal MUST go through the glands at the bottom, so as to ensure cable strain relief and waterproofing.

If more than one cable has to go through a gland, proper gland filling must be used, like the example to the left of a 3-in-1 gland filling. This is especially applicable for the low-voltage control cables, like nozzle and flow meter pulse cables.

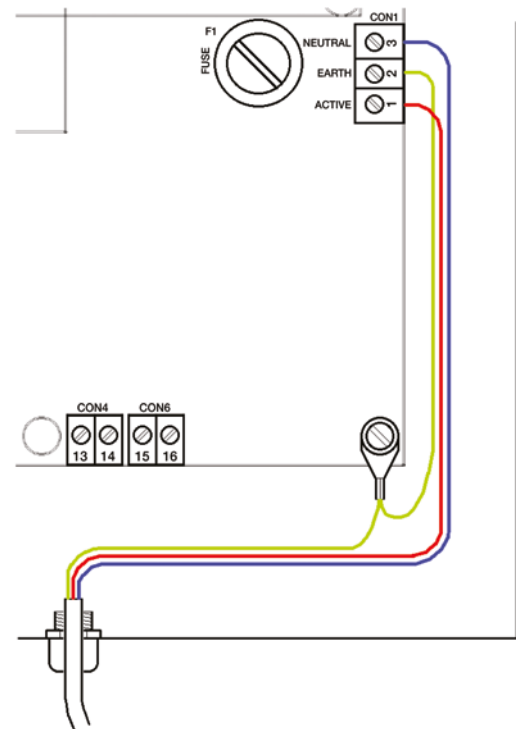
Connecting Power:

Proper earth connection MUST be ensured. Where the power cable enters through a gland, strip off the outer cable insulation, so each individual wire is accessible. Run the two power wires to the CON1 power connector, active phase to pin 1 and neutral to pin 3, but connect the earth wire to the right-hand bottom stand-off screw first, before continuing to CON1, pin 2.

See the diagram on the right.

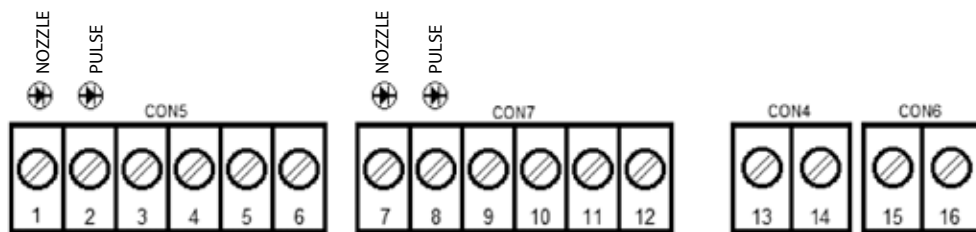
Creepage distance:

IMPORTANT: Make sure that uninsulated wire ends are pushed all the way into the metal part of the terminal blocks, so that no metal part of the wire is exposed. This will ensure the minimum creepage distance of 6.4mm is observed. This requirement applies to the power and relay connectors only (CON1, CON4 and CON6).



Connecting Pumps:

Whether the terminal software settings support 1 or 2 pumps is managed by MCS according to the customer's plan. Connection of the pumps is done on the connector pins on the bottom of the board.



Please note the LEDs above the pin connectors, indicating nozzle and pulse input.

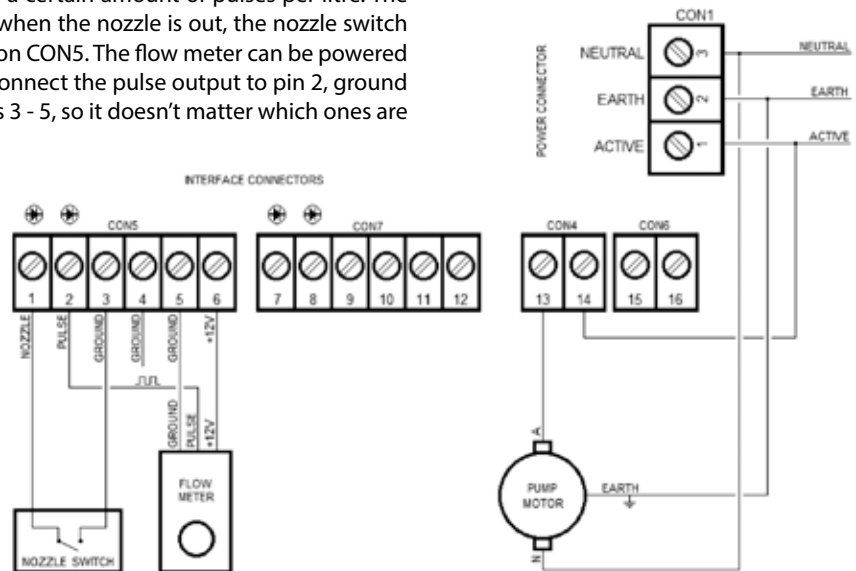
Pump A	Pump B	Description
1	7	Nozzle input, active low
2	8	Pulse input, active low
3	9	Ground
4	10	Ground
5	11	Ground
6	12	+12V for flow meter, max. 350mA
13-14	15-16	Pump relay contacts, N/O, see ratings under 'Specifications'

Connection Example: Simple Pump Bowser to Pump A:

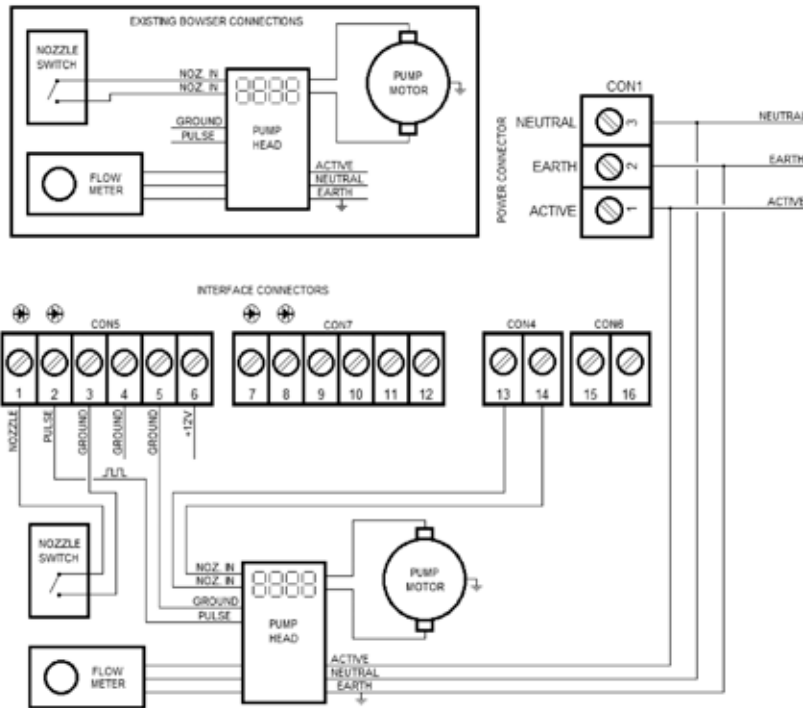
The diagram to the right shows how to connect a simple bowser to Sapphire Lite.

The bowser could consist of a mechanical display that shows the fuelled volume, a fuel pump, a nozzle switch and a flow meter. The flow meter produces a certain amount of pulses per litre. The nozzle switch must be an N/C-type (normally closed), ie. when the nozzle is out, the nozzle switch is closed. Connect the nozzle switch between pin 1 and 3 on CON5. The flow meter can be powered by the terminal on pin 6, provided it can run on 12VDC. Connect the pulse output to pin 2, ground to pin 5 and power to pin 6. Note: Ground is found on pins 3 - 5, so it doesn't matter which ones are used.

The pump just needs AC power to run, e.g. 240VAC, but it must be controlled by the terminal. So connect pin 14 to the active phase from the mains, pin 13 to the active phase input on the pump, and the neutral from the mains to the neutral on the pump. Also, connect the earth on the pump to earth from the mains. The terminal itself gets power from the active and neutral from the mains, as shown on the figure. Remember to connect earth as well. If the bowser should be connected to Pump B's controls, use CON7, pins 7-12, and CON6, pins 15 and 16, instead.



Connection Example: Electronic Bowser to Pump A



The top left diagram shows how to connect an electronic bowser to Sapphire Lite.

The figure shows how an existing electronic bowser could be wired. The pump head controls the pump and uses as inputs a nozzle switch and a flow meter. The pump head also has a pulse out for counting fuelled volume by an external device. Underneath is shown how the bowser could be connected to Sapphire Lite. The nozzle switch is simply disconnected from the pump head and attached to CON5, pin 1 and 3. In turn, the nozzle inputs on the pump head are simply connected to pins 13 and 14 on CON4. Hence, when a fuelling is authorised and the nozzle is lifted, the contacts of the pump relay on CON4 will close, thus simulating a nozzle-taken signal to the pump head. The pump head itself takes care of starting the fuel pump. The pulse output from the pump head is connected to pins 2 and 5 on CON5. There is no need to power the pulse output, so the +12VDC on CON5, pin 6, is not used.

The mains power is connected to both the bowser and the terminal power inputs as shown. Remember to connect earth as well.

iPETROLite Tank Gauging:

Initial Checks:

The program version for the **iPETROLite** must be 1.10 or higher, and the client program on the stick must be 1.4.0.0 or higher. The upgrades to these versions can be carried out later, once the basics have been setup on **iPETRO** and on the terminal. Please note there will be no tank gauge functionality before this is done.

The terminal version can be displayed on the terminal display by pressing Enter. View the client version by inserting the stick on a PC, go to folder 'client', right-click on slclient.exe, click on Properties, then Details.

Stage 01:

When setting up the terminal on **iPETRO**, remember to carry out the setup of the tank gauge at the same time. The tank gauge that is available in the customers stock is applied in the same way as a 2-pump upgrade.

On the setup page on **iPETRO**, choose the tank gauge driver and submit the changes. Now do a synchronisation of the USB stick on **iPETRO**. This will ensure the config.dat file and the tank gauge driver file (called tg.bin) are both present and correctly set up. Check that both files are in the DATA folder.

Stage 02:

If the terminal is not already set up, make sure this is done by following the instructions in the 'Menu system' section. In particular, make sure the terminal ID and the pump's product number is correct according to **iPETRO**.

Carry out a sync on the terminal with the USB stick. Amongst other items, the tank gauge driver will be copied to the terminal. At this point the terminal display will say: Processing TG, and then in the second line a progress bar will be filled. This process will happen quickly. After the USB has been processed, unplug it and enter the menu again.

The tank gauge settings can now be accessed and adjusted.

iPETROLite Tank Gauging: Stage 02 Continued...

Ocio/Puisi Tank Gauge Setup:

Use the up/down arrows to scroll through the list and select the desired item. Right/left arrows will adjust values, hold down the key to adjust faster; the following items can be adjusted:

▲	Puisi enable	Yes
▼	Puisi speed	1200
▼	Puisi product	X
▼	Tank litres	XXXX
▼	Height mm	XXXX
▼	Shape B	Yes/No
▼	Beeps	Yes/No

1. **Pump enable:** Set to Yes.
2. **Puisi speed:** Set to 1200 baud (or bit/sec).
3. **Puisi product:** Set to the product number corresponding to the product in the pump setup for the pump attached to the tank.

4. **Tank litres:** Set to tank's capacity in litres.
5. **Height mm:** Set to tank's internal height in millimetres.
6. **Shape B:** Set to Yes if the tank is round, lying down, otherwise No. (Please see 'Explanation of Shape B' below).
7. **Beeps:** Set to Yes initially, which results in certain beeps every second if the program can understand the data sent to it from the gauge. When all is working, set to No.

Note: The terminal will only receive data from the gauge when in idle, i.e. when the display says 'Read tag'.

Explanation of Shape B:

The Ocio setup can choose the shape of the tank itself, and shape B is a cylindrical tank lying down. When that is the case, there is not a linear relationship between the fluid's height in the tank and the volume.

Only the height of fluid is sent from the Ocio gauge, this then requires the volume to be calculated. If the tank was a square box or even an upright cylinder, the relationship between the height and the volume is linear. Double the height, double the volume. But when the cylinder is lying down, maths has to be employed to work out the volume from the height, specifically square root and arc sine.

In reality, the program is just using precalculated values in a table. So the shape setting is important.

iPETROLite Tank Gauging: Stage 02 Continued...

OLE Tank Gauge Setup:

Use the up/down arrows to scroll through the list and select the desired item. Right/left arrows will adjust values, hold down the key to adjust faster; the following items can be adjusted:

▲ OLE enable	Yes
Baudrate	9600
Parity	E/N/O
Product A	X
Product B	X
Dev addr A	X
Dev addr B	X
▼ Beeps	Yes/No

1. **OLE enable:** Set to Yes.
2. **Baudrate:** Set to the baudrate setting of the tank gauge (most likely 9600).
3. **Parity:** Set to the parity setting of the tank gauge (E for Even, N for None, O for Odd).

4. **Product A:** Set to the product number corresponding to the product in the pump A setup for the pump attached to the tank.
5. **Product B:** Set to the product number corresponding to the product in the pump B setup for the pump attached to the tank.
6. **Dev addr A:** Set to the device address corresponding to the pump A tank.
7. **Dev addr B:** Set to the device address corresponding to the pump B tank.
8. **Beeps:** Set to Yes initially, which results in a high pitch beep every second if the driver receives valid data from the gauge. If not, a low pitch beep is issued. When all is working, set to No.

Note: The terminal will only receive data from the gauge when in idle, i.e. when the display says 'Read tag'.

Note: If only one pump is set up, drawing from only one tank, set the Product B and Dev addr B settings to 0. If two pumps are set up, drawing from the same tank, the product numbers for the pump setups must be identical, and both Product A and Product B must be set to that number. Also, Dev addr A and Dev addr B must be identical and set to the device address of the one and only tank gauge attached. If two pumps are set up, drawing from two different tanks, Product A and Product B must be set to the corresponding product numbers in the pump setups, and Dev addr A and Dev addr B must be set to the corresponding device addresses of the tank gauges attached. The tank gauge hardware could be one unit capable of reading two different tank gauges, or two different units reading one gauge each. In case of the latter, the wires from the units are simply connected in parallel.

iPETROLite Tank Gauging:

Stage 03:

The hardware interface used for tank gauge communication for both Ocio and OLE is RS485. The interface type can be chosen on the main board and the tank gauge wires are connected to CON13 (see the next section 'How to Connect the Tank Gauge to iPETRO Lite).

If the Beeps have been turned on in the terminal's tank gauge setup menu, the following applies:

Ocio/Piusi: If operational, a low and a high pitch beep is issued once a second, one right after the other. If no valid data is received, no beeps are issued.

OLE: If operational, a high pitch beep is issued once a second, one for each tank setup. If no valid data is received, a low pitch beep is issued.

When a batch of transactions is closed and transferred to the USB stick (when making a sync on the terminal), a valid dip read must be available for it to be included in the batch. When that is the case, a tank gauge reading will appear on the site page on iPETRO as a dip reading of the source type TG.

How to Connect **Ocio** and **OLE** Tank Gauges to **iPETRO Lite**:

The serial interface on iPETRO Lite supports both RS232 and RS485. Set the 2 jumpers in the jumper field J2 in position RS485 for Ocio and OLE tank gauges (see right-hand picture below). Connect + and - on the tank gauge to TXD (A+) and RXD (B-) on CON13, respectively.

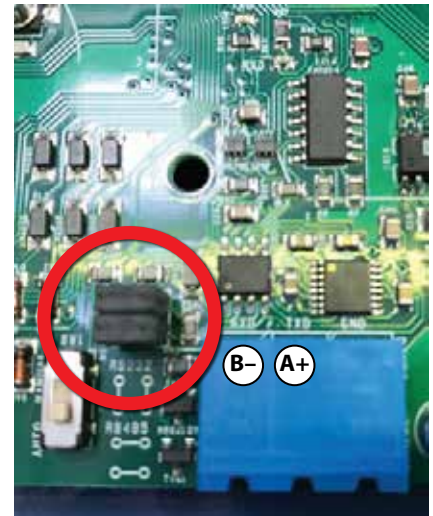
Ocio Tank Gauge Connector



OLE Tank Gauge Connector

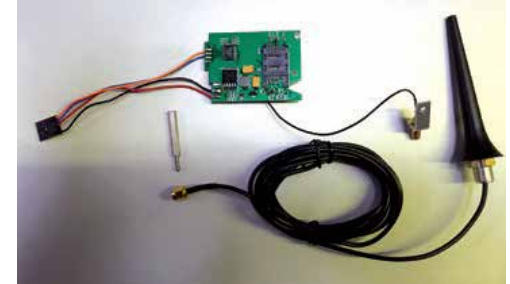


iPETRO Lite Tank Gauge Connector

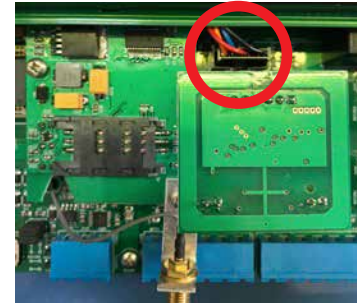


Installation of the iPETRO Lite Online upgrade Kit:

By carrying out the following steps the Sapphire Lite can now be given online functionality.
Any issues, please contact MCS support on support@mcscardsystems.com.



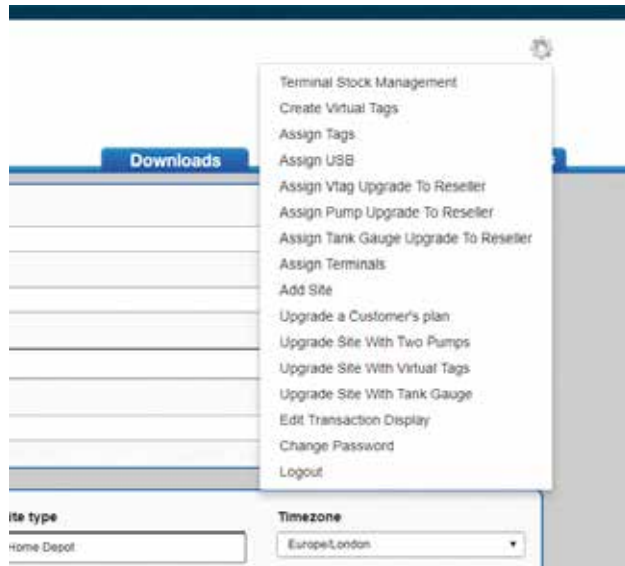
Hardware Installation:



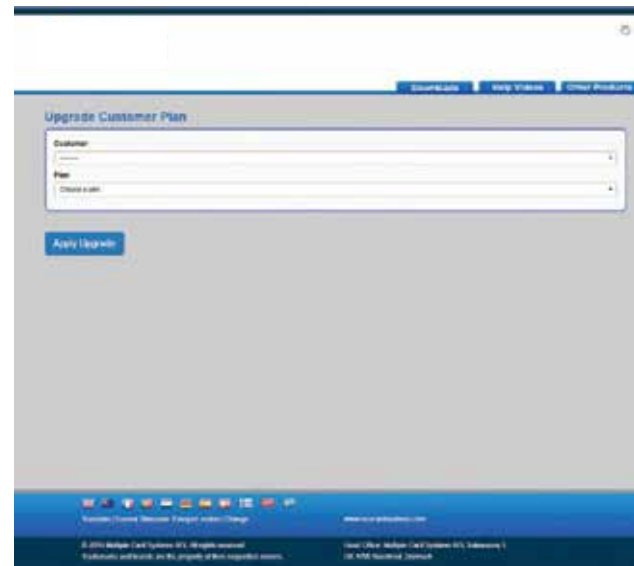
1. Before install, please note the IMEI no.
 2. Install the modem and antenna bracket.
 3. Plug the modem cable in to CON10.
 4. Insert the SIM on the modem.
 5. Finally, install the antenna in free air, and connect it to the antenna connector on the modem.
- Now the Sapphire Lite is ready to be upgraded to online on the connect website, please see overpage for details.

Upgrading the iPETRO Lite to Online within the iPETRO website:

Now that the iPETRO Lite Online upgrade kit has been installed the unit must be 'initialised' within the iPETRO website.

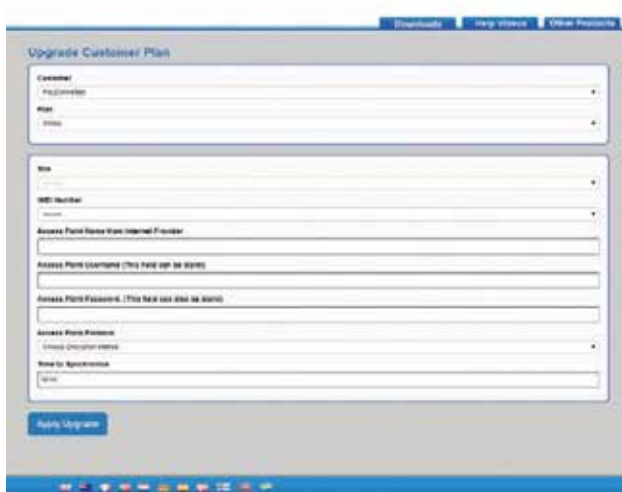


1. To update an existing site, click the menu and then choose "Upgrade a Customer's plan":

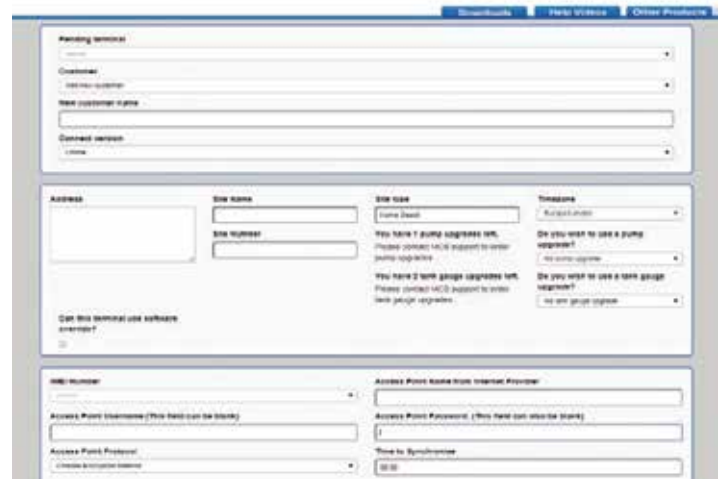


2. Choose the customer and set plan to online

Upgrading the iPETRO Lite to Online within the iPETRO website continued:



3. Then fill out the details and click 'Apply Upgrade'.



4. When adding a new site as an online Sapphire Lite, choose online in connect version. This completes the setup of the Sapphire Lite Online terminal within Connect.

Do a sync with Connect via the USB stick on a PC. The stick will then contain all the necessary setup in order to upgrade the terminal to online. Do a sync with the USB stick on the terminal. After the sync, the software will be upgraded to the online version (version 2.02 or higher). After the upgrade the terminal will reset and after 30 seconds it will start a ping and a sync with Connect through the installed modem. Three settings can be adjusted in the setup menu, if need be: URL, APN and sync interval. See the relevant sub-headings under 'Menu System' from page 31 on.



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Notes:

Drill Guide

Drill guide not sat in the pocket on this page?

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