CARLO GAVAZZI
Automation Components

CARLO GAVAZZI

UWP-DLB

User manual
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Contents

About this user guide 4

Safety Instructions 5

UWP-DLB overview 6

Quick Start Steps 7

Logging-on for the first time 8

Logins and user types 10

Network Setup 11

Connect UWP-DLB to a CSMS backend (optional) 14

Configuring New Chargers 17

Charging Transactions 28

Whitelists 32

Charging times and Time Zones 34

Importing and Exporting Settings 35

UWP-DLB Licensing 36

Remote Access to UWP-DLB devices through the MAIACloud 37

Uncontactable Chargers / Meters and Load Balancing 39

UWP-DLB load balancing configuration 40

Load Balancing FAQs 41

Information and control of chargers 45

Admin and System Update 48

LEDs and reset 51

Email Report and Email Notifications 52

Security 54

View and Download the Debug log 56

Assembler 57

Site Visualiser 61

Building Management (Modbus Access) 62

Building Management API (API Settings) 65

Tested Chargers 71

Charger OCPP Messages 76

Log Out 78

About this user guide

Who is this instruction manual for?

The UWP-DLB instruction manual is for electrical engineers and product installers. It includes information on how to assemble the UWP-DLB and use the Carlo Gavazzi software to configure the UWP-DLB.

Wiring work involving live electrical current should always be performed by a qualified electrician.

Updates to this user guide

Firmware and Documentation updates can be found at https://gavazziautomation.com

Safety Instructions

⚠WARNING



Read and understand this manual and its safety instructions before using this product. Failure to follow the safety instructions can result in serious injury or death and/or damage to equipment.

Explanation of safety warnings

Carlo Gavazzi use the following safety warnings and messages in our documentation:

NOTICE

Indicates information considered important, but not hazard related.

NOTICE

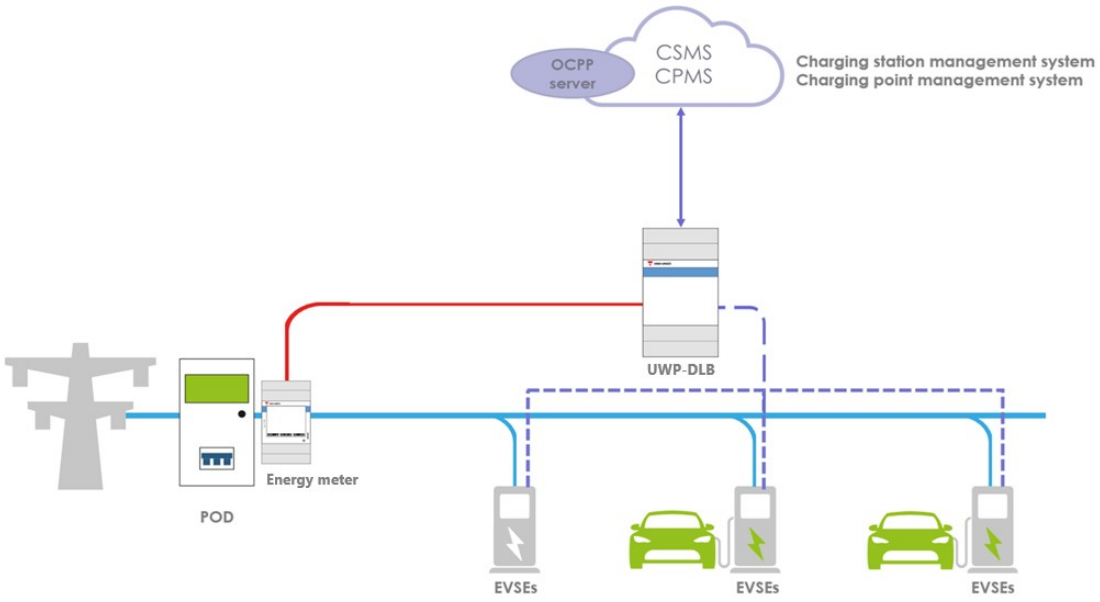
Indicates there is a risk of electrostatic discharge (ESD). Take anti-static precautions. Failure to do so could result in electrical damage to equipment.

UWP-DLB overview

UWP-DLB is a local controller for the dynamic load management (DLM) of EV chargers.

It is designed to be installed onsite, local to the EV chargers, where it:

- Monitors OCPP messages relating to charging limits
- Monitors energy use on-site using a meter using TCP/RS485 (optional)
- Automatically adjusts the EV charger limits so that the load is balanced to the site
- Works with single and three phase systems
- Works with AC and/or DC chargers
- UWP-DLB can be configured locally or remotely using its website interface
- Support for whitelists of RFIDs (when used without a CSMS)
- Downloading of transactions is now supported in CSV and NEM12 format
- Supports grouping of chargers for separate cable run limits, and priority channels
- Network proxy allows access to configure other 3rd party IP devices using UWP-DLB



Intended use

UWP-DLB is designed to be used in two scenarios:

- Online: As a local load balancer, authorizing transactions through a cloud-based charge station management system (CSMS). Provides backup of transactions in the event of an internet outage.
- Offline: As a local load balancer with local authorization. In this mode RFID tags whitelist are used.

Quick Start Steps

When setting up a new device these are the recommended steps:

1. Connect via
   - Remote Access (see "Remote Access to UWP-DLB devices through the MAIACloud" on page 37)
   - Wired Ethernet
2. Log in using the **Assembler** login and default password (see "Logging-on for the first time" on the facing page)
3. Configure the network (see "Network Setup" on page 11)
   - Make Ethernet the primary connection, if possible, for maximum reliability.
   - When using DHCP be sure to add your MAC address of the UWP-DLB to your server or router so that the IP address doesn't move in the future, otherwise choose a static IP address for UWP-DLB.
   - If you are intending on using the modem for communications, ensure there is no gateway on the Ethernet/Wi-Fi otherwise routing will not go over the modem for external communications.
4. Change the passwords from the defaults for security purposes (see "Security" on page 54 > Change a user password).
5. Configure parameters on the **Configuration** page for your site requirements.
   - Include the CSMS uplink if you have a CSMS backend (see "Connect UWP-DLB to a CSMS backend (optional)" on page 14)
   - Enter the site power input (see "Configuring New Chargers" on page 17 > Removing groups)
   - Enable the external meter if applicable (see "UWP-DLB load balancing configuration" on page 40)
   - Configure chargers to point to the IP address of UWP-DLB
   - Ensure the chargers, PC/Laptop and internet connections are configured on networks that can communicate with each other. If in doubt request help from Carlo Gavazzi support or your in-house network engineers.
6. Configure each connected charger
   - Set the mode of operation for the charger either Single/Three Phase
   - Physical electrical connections of the chargers (L1/L2/L3)
   - Maximum power each charger can utilize.
   - Current reported in Amps or Watts in their charger's smart profile
   - Assign a friendly name (optional) for each charger

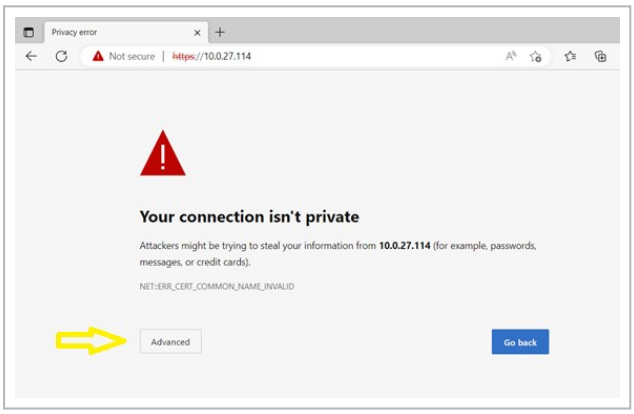
7. When running offline (no CSMS)
    - Configure RFID tags if available (see "Whitelists" on page 32)

Logging-on for the first time

1. After powering up and connecting the controller to the LAN network, after about two minutes you will be able to find the IP address and connect to the web app.

   The IP address can be found by looking at the DHCP list on your server/router for the network name UWP-DLB-xxxx or by using an IP scanner software.

   Note: no valid signed certificate will be available for this network name, as this is a HTTPS secure connection it will give a browser warning that must be dismissed to continue to the website.



2. Click on “Advanced”, then “Continue to xx.xx.xx.xx”:



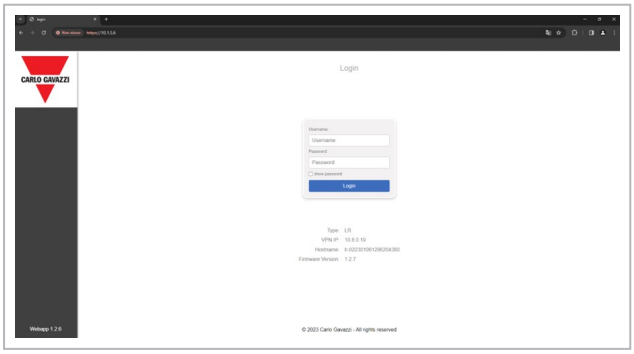
Once connected you should log into the web interface.

There are three accounts, each with different permissions.

3. For setting up the UWP-DLB, log in as **Assembler** using the follow details:

Username: admin

Password: admin



Notes:

- *When you log in for the first time you will be requested to change your password from the default to a unique password.*
- *If you ever factory reset the unit, this will revert to the factory default again.*

4. When the browser refreshes, it will show the **Info** page.

You can now use the various settings to configure your UWP-DLB.

Logins and user types

There are three default logins for UWP-DLB. The three logins represent the three user types, each of which has access to different features based on their level (level 1 is lowest and level 3 is highest).

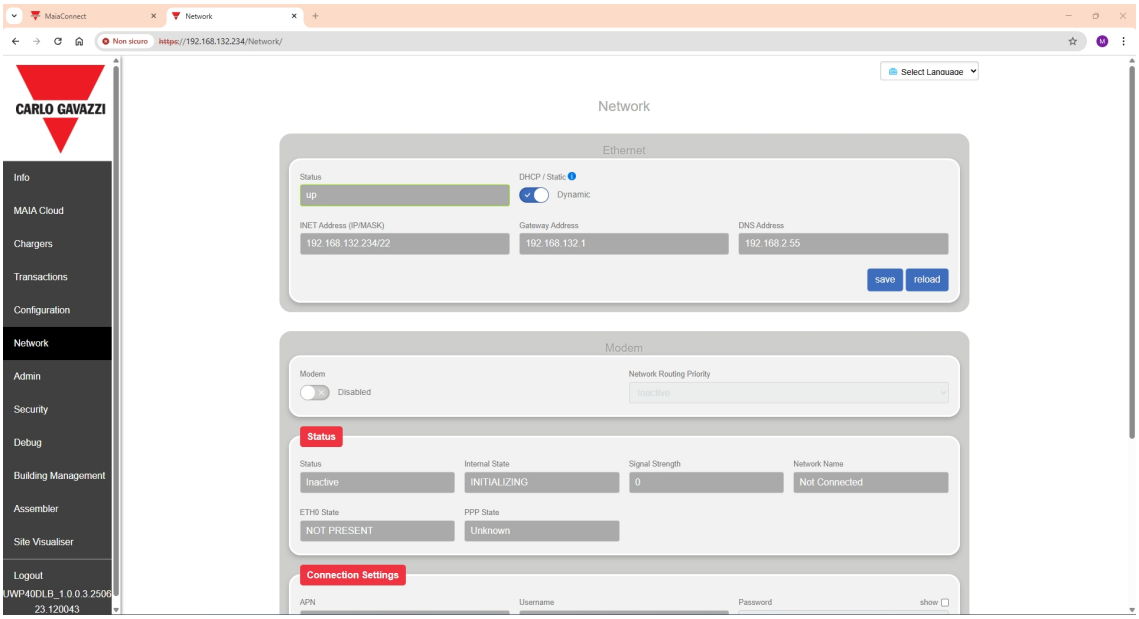
EV / Installer are not available until the user has set a password for them through the Assembler login.

- Level 1 login (used to view chargers and transactions):
  Username: EV
  Password: Set through assembler login
- Level 2 login:
  Username: Installer
  Password: Set through assembler login
- Level 3 login (Assembler user with administrator rights):
  Username: admin
- **Password**: admin

Note that the Assembler is the highest-level access, most of the UWP-DLB settings in this document are assuming the user has logged in with this level.

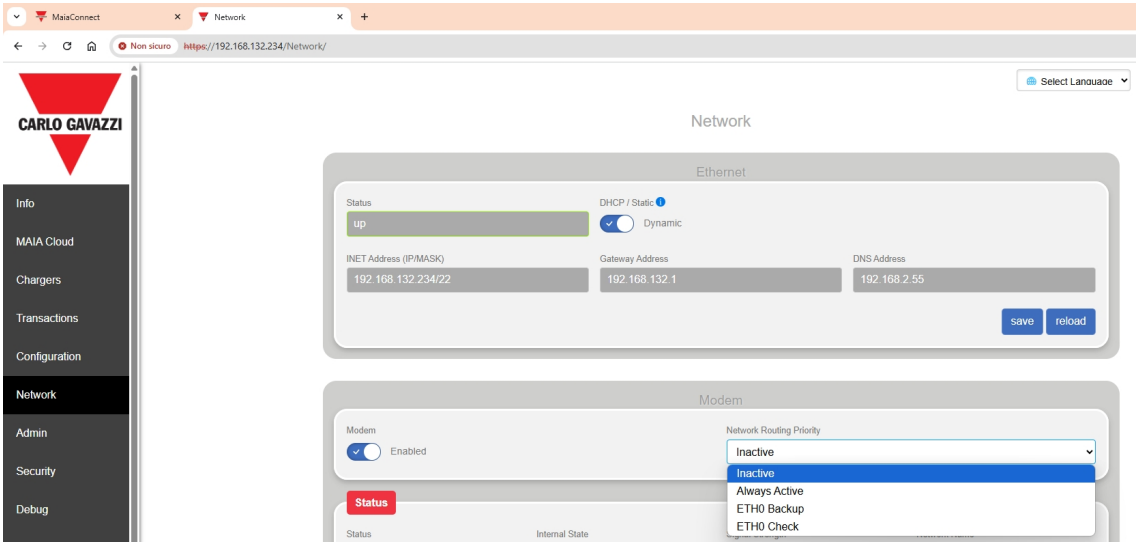
Network Setup

Once connected to UWP-DLB you should confirm your network settings in the **Network** page:



Network Route Priority

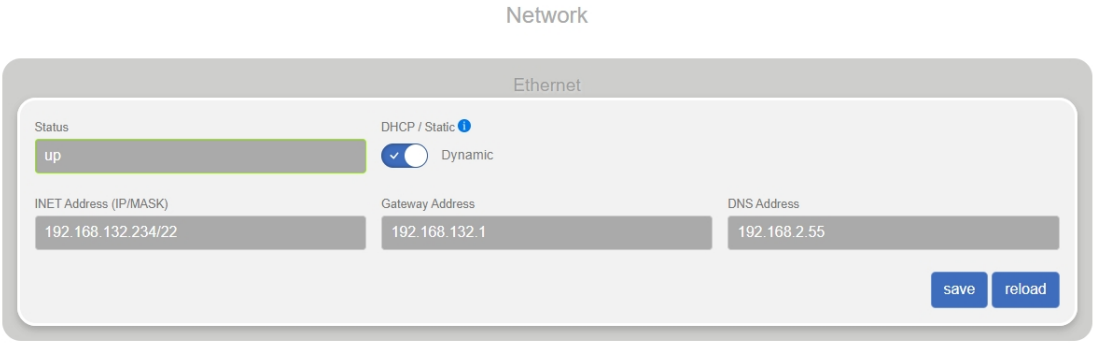
If you are using multiple networks (Ethernet + 4G) you should tell UWP-DLB which connection gives you a path to the internet by selecting the internet interface:



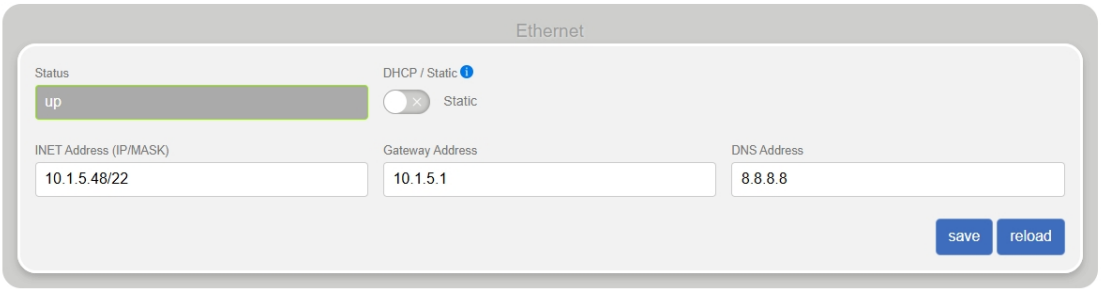
You may wish to set a number of chargers up on Ethernet, then use the 4G on-board modem for remote access/monitoring, in this case you would select 4G in the box here.

Ethernet

Ethernet if connected will shows its status, IP address, DNS gateway and DNS server when on DHCP mode:



Turn DHCP off to enter static IP information:



When entering static address, be sure to enter gateway and DNS servers if you are connecting to a CSMS else domain names and addresses off the current local subnet cannot be contacted.

The IP address when working on static IPs is entered with the IP/CIDR, this means a subnet mask of 255.255.255.0 is a CIDR of /24, for an IP address 10.0.27.114 it would be entered as:

10.0.27.114/24

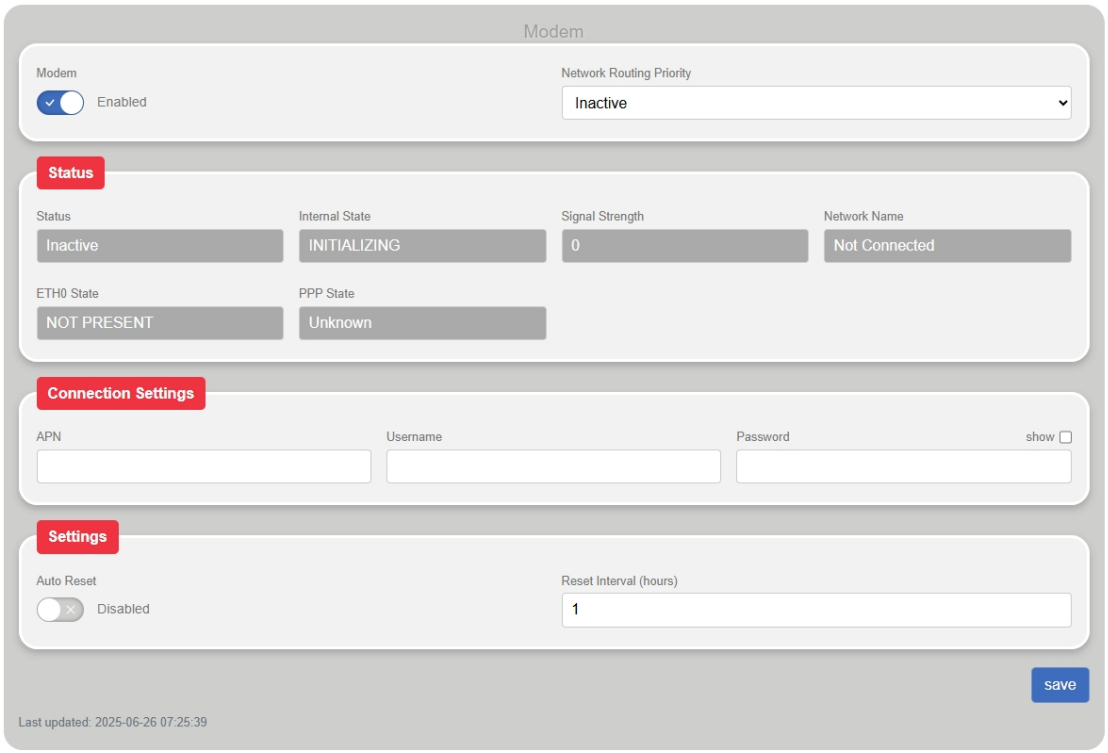
If you are using DHCP ensure your router has the UWP-DLB device listed as a reserved IP address, i.e. it will constantly get the same IP address. Failure to do so will mean the IP address may change over time, any chargers connecting to the old address will be disconnected.

Modem Support

UWP-DLB supports a cellular 4G modem. The modem requires a 4G enabled SIM to be fitted.

The user should enter the network SIM **APN**, **username**, **password** and click **save**.

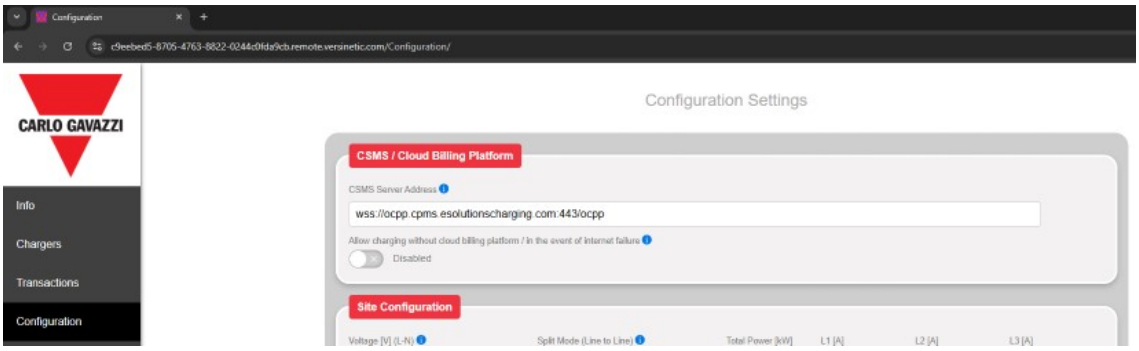
Note: If a gateway is present on Ethernet/Wi-Fi the system will attempt to use this for the remote cloud services, if no internet capability is available, you can use a SIM for the 4G modem, ensure that the Route to Internet option at the top of the screen is set to Cellular to tell UWP-DLB to route internet traffic appropriately.


Modem
Modem
Enabled
Network Routing Priority
Inactive
Status
Status
Inactive
Internal State
INITIALIZING
Signal Strength
0
Network Name
Not Connected
ETH0 State
NOT PRESENT
PPP State
Unknown
Connection Settings
APN
Username
Password
show
Settings
Auto Reset
Disabled
Reset Interval (hours)
1
save
Last updated: 2025-06-26 07:25:39

Connect UWP-DLB to a CSMS backend (optional)

You can connect your UWP-DLB to a Charging Station Management System (CSMS) and then use the CSMS to authorise charging requests. If you are not using a CSMS the default settings will result in UWP-DLB not attempting to connect to a cloud billing platform, if this is intended this section can be skipped.

To use a CSMS with UWP-DLB, set up the connection on the Configuration page, entering the cloud billing platform (CSMS) into the server address box below:



To connect your UWP-DLB to a CSMS:

1. Navigate to the **Configuration** page.
2. Enter the **CSMS Server Address**. Set this as your CSMS protocol, address and port number using this format:

   ```
   <protocol>://<IP>:<Port>
   For example: ws://10.0.27.81:80
   ```

NOTICE

WS (no SSL) defaults to using port 80 if no port is specified

WSS (SSL encryption) defaults to using port 443 if no port is specified

It is best to be explicit and include the port in the above connection string for clarity

3. You can optionally add a prefix to your CSMS address, this is then passed with every message to the CSMS, this makes it clearer that a charger is part of a particular UWP-DLB installation.

   For example:

CSMS Server Address	wss://ocpp-toolkit-api.site.app/
Identity	zone1

Charger ID	mp-012345678
Would result in a charger connecting to	wss://ocpp-toolkit-api.site.app/zone1/mp-012345678

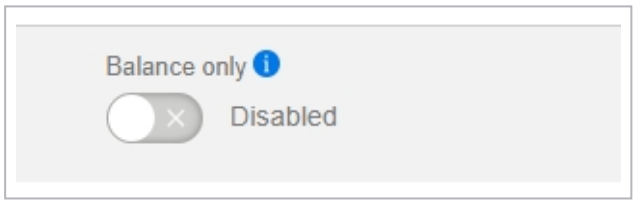
4. Allow charging without cloud billing platform (in Standalone mode) - default Enabled



- Enabled - will let new charge sessions continue without CSMS authentication (this will use the local whitelist if enabled or just auto accept transactions if the RFID whitelist is disabled)
- Disabled - will stop any new sessions from starting unless a CSMS is attached, any in progress transaction will be allowed to complete.

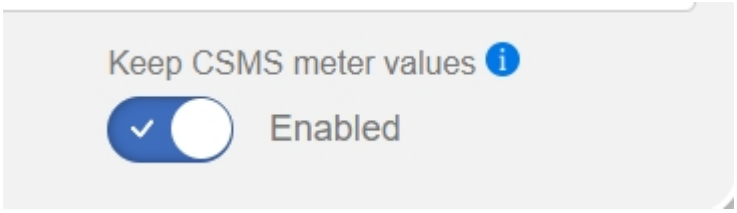
*Note: When no CSMS is used, this should be set to **Enabled** or otherwise no new charging sessions will be allowed*

5. Balance only can be enabled, stopping any messages from UWP-DLB overriding CSMS configuration of local authorization. Only enable this if you require this, enabling it will disable UWP-DLB ability to handle offline charging and whitelists:

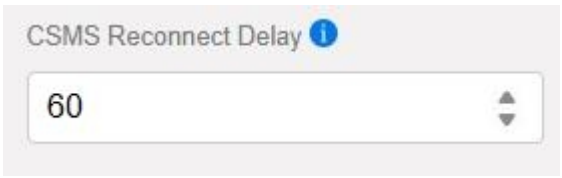


Note.
When balance only is selected, the UWP-DLB doesn't send these keys:
({"key":"LocalAuthorizeOffline","value":"false"})");
({"key":"StopTransactionOnEVSideDisconnect","value":"true"})");
({"key":"LocalAuthListEnabled","value":"false"})");
({"key":"AuthorizationCacheEnabled","value":"false"})");
({"key":"AuthorizeRemoteTxRequests","value":"true"})");
({"key":"AllowOfflineTxForUnknownId","value":"false"})");

6. Keep CSMS meter values is by default enabled, this will forward any meter configuration from the CSMS to the charger, incompatible messages may stop UWP-DLB from load balancing, this can be fixed on the CSMS or by disabling this feature, which then only allows a set configuration to the charger but may not be compatible with the CSMS end:



7. Select **Save**.
8. **CSMS Reconnect Delay:** the delay (in seconds) before attempting to reconnect to the CSMS backend (60 seconds default)

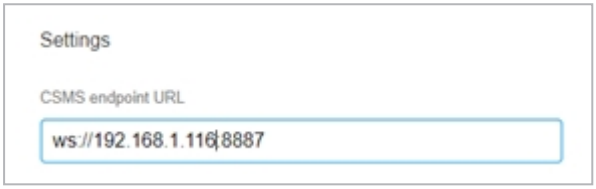


9. **Add version:** when enabled, the FW version of the UWPDLB is appended to any boot notificaiton message sent to the CSMS backend (disabled by default)



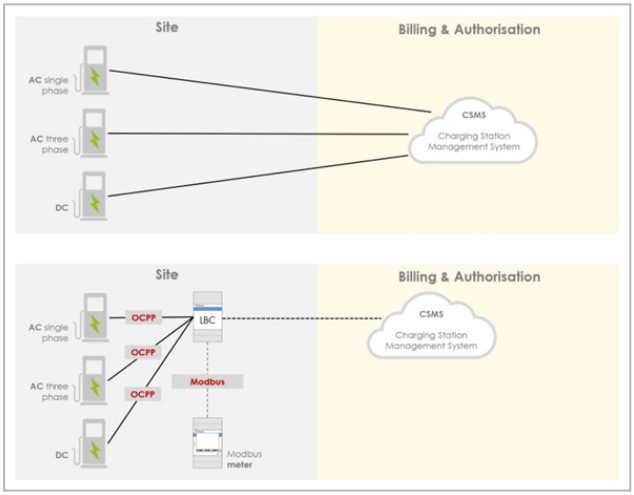
10. Log in to each of your chargers. Configure chargers to use the UWP-DLB's IP address as the CSMS for the charger. Note use port 8887 for WS and 8886 for WSS on UWP-DLB.

    An example of a charger connecting to UWP- DLB located at 192.168.1.116:



Example of the CSMS entered on the Charge.

11. The goal is for the chargers to connect to the CSMS via the UWP-DLB rather than directly. For instance, your site diagram may look like:



To find the UWP-DLB's IP address, see Network Setup.

Please refer to the documentation for your EV charger for details on how to set the CSMS reference to use the UWP-DLB's IP address.

12. Log in to your CSMS and configure it to allow the chargers that have the UWP-DLB **Identity** prefix if required.

    For details, refer to the manufacturer's documentation for your CSMS.

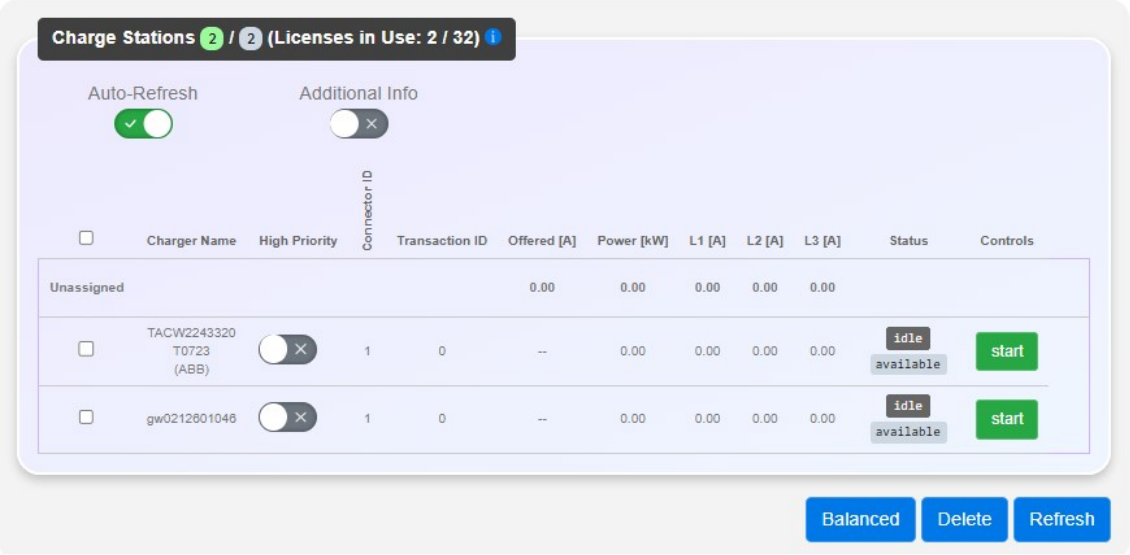
Configuring New Chargers

Once a charger has connected with UWP-DLB it will show up in the available chargers on the **Info** screen.

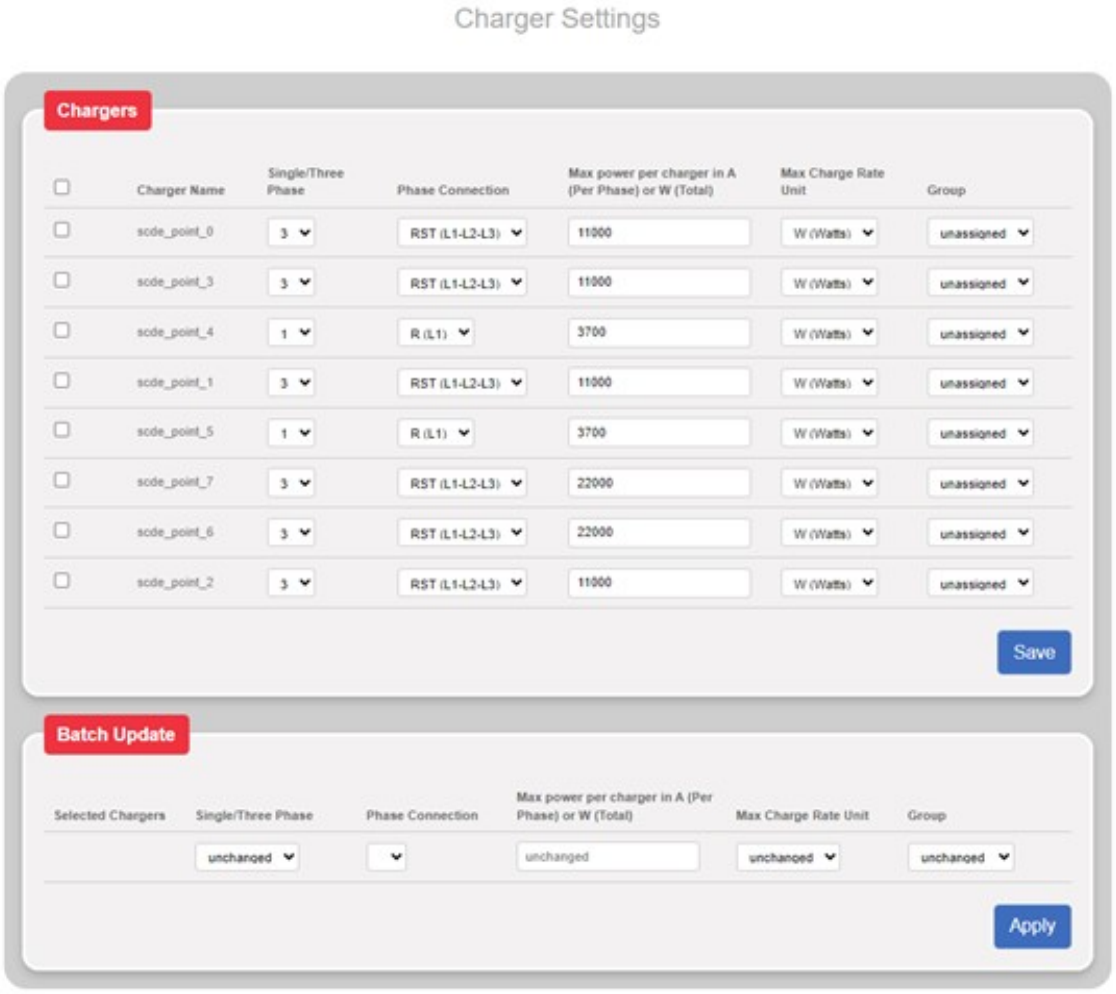
The **Info** page shown without any chargers:



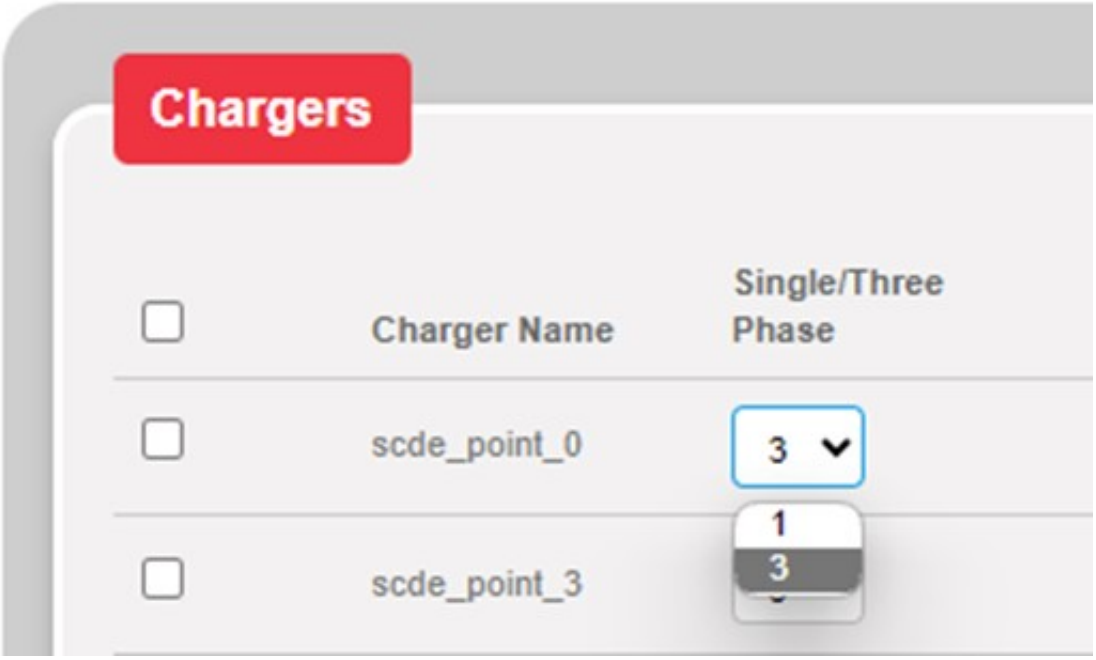
The **Info** page shown with chargers connected:



Navigate to the **Chargers** page to configure the new device:

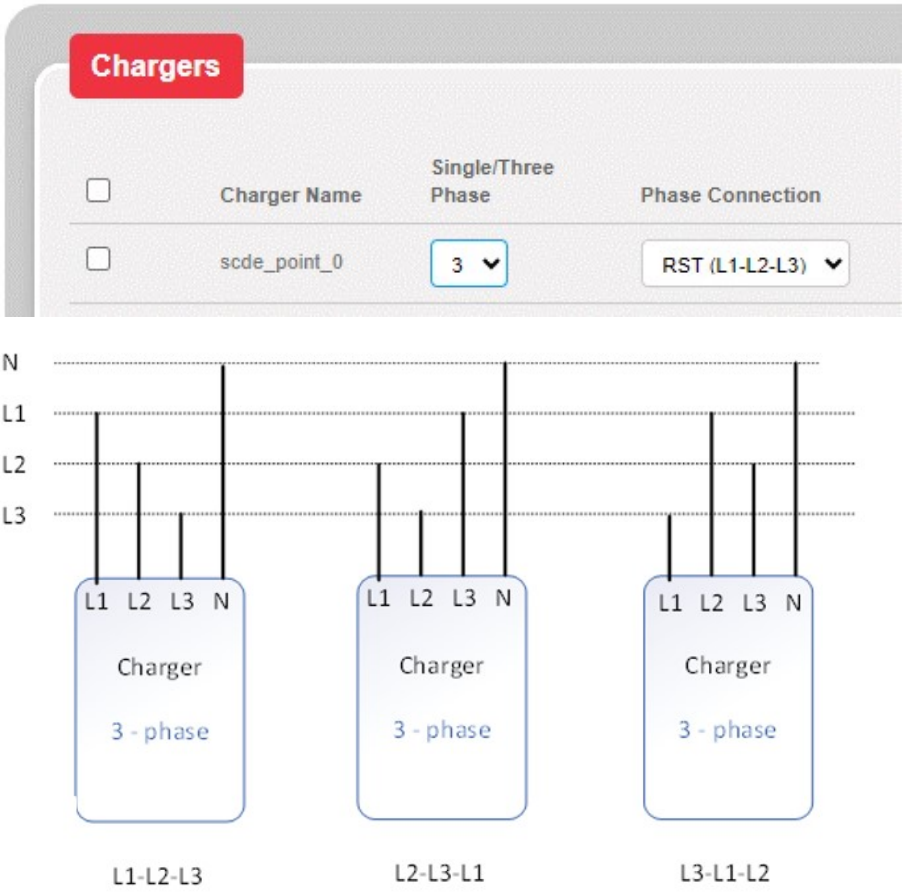


The charger can be configured to be Single / Three Phase (default single phase):



3 Phase selection

Using three phase chargers the following wiring combinations can be selected (default L1-L2-L3):

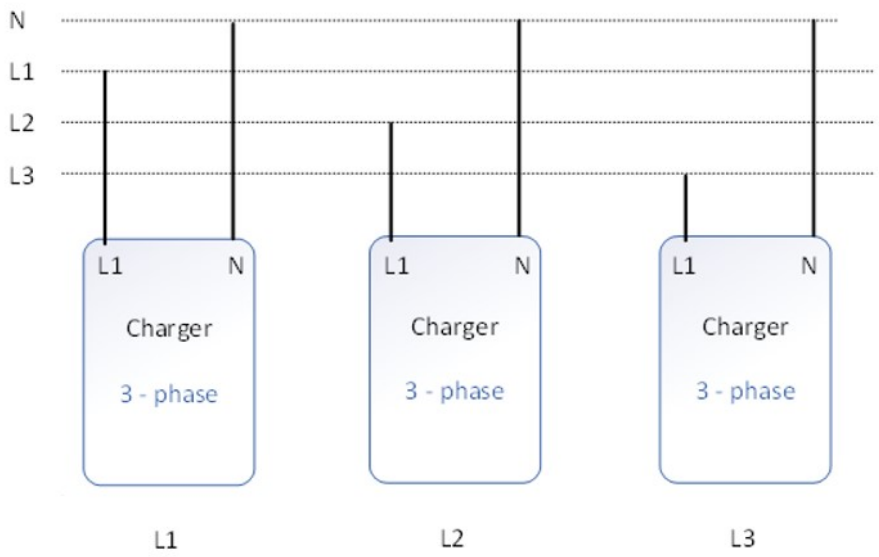


Choose the configuration to reflect the way the charger is connected to the grid.

Single Phase selection

Using single phase chargers the connected phase can be selected, default (L1):





Choose the configuration to reflect the way the charger is connected to the grid.

Phase Rotation and UWP-DLB Reporting / Control

Phase rotation configuration allows UWP-DLB to understand how the charger is reporting charge, it is not used to control how the charger can offer selection of phases to the car.

For instance, a single-phase charger (unless the charger supports its physical connection in its own configuration) will report power on L1 only, UWP-DLB uses its configuration to understand the charger is really connected to L2 or L3, despite it being reported on L1 by the charger.

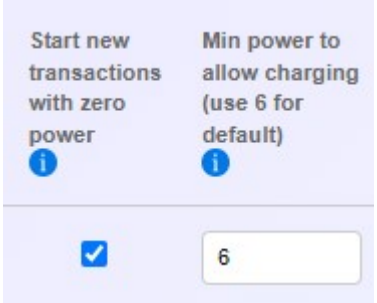
Some chargers may have a phase configuration built in, if this is the case you do not need to configure it on UWP-DLB, configuring it on both ends will cancel out the reported configuration. It is advisable to only configure phase rotation on UWP-DLB then all your charger configurations can be viewed in one place for easier understanding of the site.

Three phase systems AC chargers typically draw power off all phases equally when connected to a car, some single-phase only cars however may only draw power from the first phase even if all three are present. In these circumstances the install of the chargers may rotate the phases to different chargers to balance the system. UWP-DLB needs to understand this rotation to make sure it correctly monitors power reported by the chargers, the configuration cannot control how the charger offers phases physically to the car only the limits on all phases available and their reporting.

Minimum Power Requirements Settings

Some AC and DC chargers require a minimum power given to them before they will show as available / online for charging.

The default settings are:



If your charger is showing it is unavailable to charge or offline when connected to UWP-DLB you may need to change these settings, firstly:

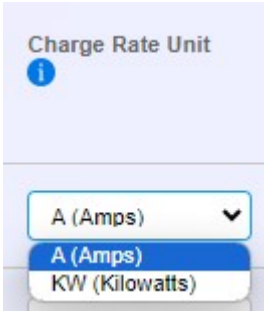
- Untick the zero-power check box, this will indicate to chargers that they can charge at the min power level immediately after authentication (the default is 6 A per phase).
- After the transaction starts UWP-DLB may increase this to the max or decrease it to pause charging as normal
- The drawbacks of this are a delay of 4-5 seconds to pause the charger if it isn't allowed to charge because of timing constraints, FIFO mode, or overall site power won't allow any further charging.

Typically, 6 A is the minimum most AC chargers expect below this they may turn off. Some chargers may require a higher minimum, if this is the case it can be overridden in the "Min power to allow charging" box.

DC chargers may have a minimum they can supply, check your manual for this, after setting the charge type to Kilowatts for DC put the minimum the charger expects, such as 25 or 50 KW as per the user guide or manual testing.

Charging Rate Unit

The smart charging profile can be selected in Amps or Watts, AC chargers use Amps, DC chargers will be configured in Watts, default is (A):



Friendly Names

Friendly names can be given to chargers to more easily identify them, these are displayed on the info screen then in brackets to the user, they are also used in the transaction logs or when using the payment terminal to identify the charger/bay.



Examples

Example of a single-phase charger connected on L1 with a 32 A max., smart profile in Amps.



For three phase chargers note that the current specified is specified per phase, so a three phase 22 KWh charger, capable of 3 x 32 A feeds should be set to 32 A:



AC single phase chargers on alternating phases:

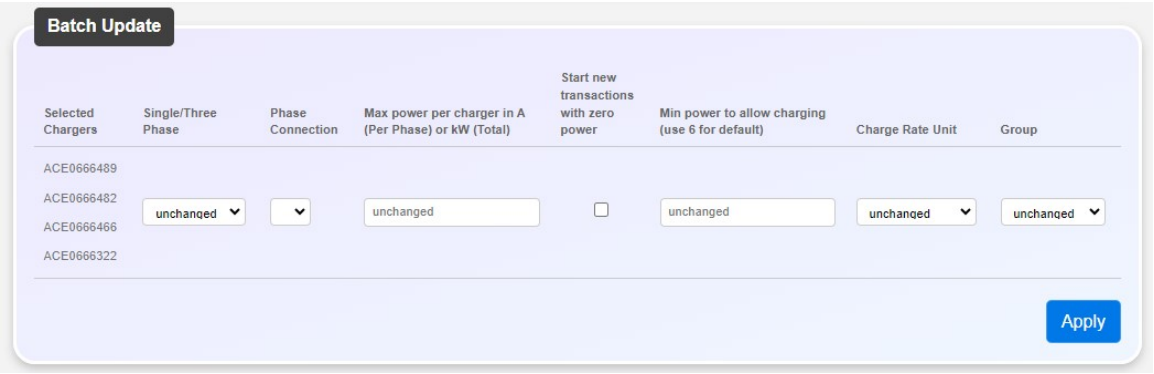


Batch configuration

If you have a large number of similar chargers, you can select one or all of the chargers:



Then use the batch update feature to set the same value for all the selected items (you can use “unchanged” if any elements should remain the same:



Configure chargers as a group

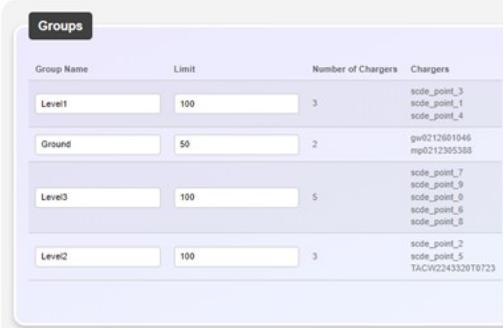
Chargers can be grouped together, first use the add group to append a new group and limit in A. The limit is taken as the current on all phases, i.e. 100 A will limit L1/L2/L3 to 100 A each (for a total of 300 A) if using three phase.

Groups can be given a descriptive name:



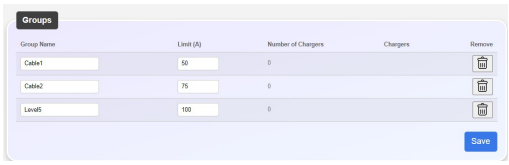
Assigning chargers to the groups will be shown then under the group section.

The limits and name can be changed here.



Removing Groups

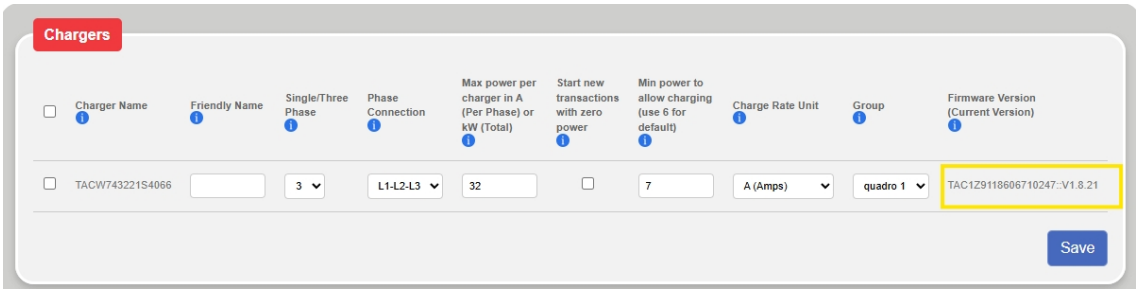
Groups can be removed using the trash icon next to the group:



Updating Charger Firmware

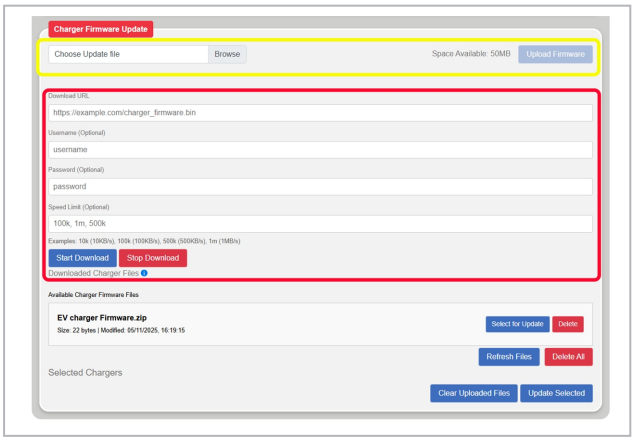
UWP-DLB can be used to update charger firmware using the OCPP connection, this may save costly site visits for updates if this cannot be performed from the CSMS or if UWP-DLB is operating standalone without a CSMS.

To understand the firmware version running on your chargers refer to the configuration page and the firmware column, this is only populated for connected chargers:



To update there are two options:

1. Get the appropriate **Charger Firmware** file and upload this by **Browsing** for the file, then uploading the firmware using the **Upload** button shown in yellow below:

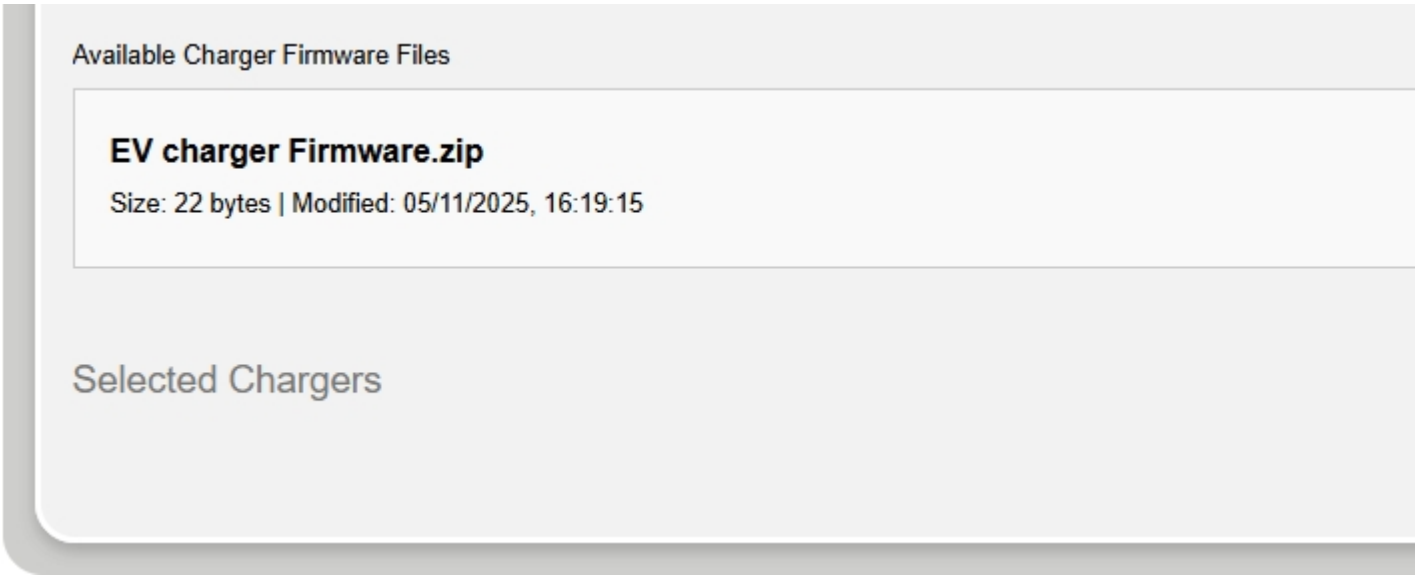


2. Or fill out the Download URL details in red, this will fetch the firmware from the URL in the background, this process may take many hours on a cellular connection for large firmware files, it will retry and resume on slow or unstable connections.

After uploading, the files will be retained on the UWP-DLB, you can upload up to 5 firmware files at any one time (total of approx. 140MB), these are then shown below. Select the appropriate file, then select the chargers that you are trying to update:



Select the uploaded firmware using **select for update**, then click on **Update Selected with xxx** to instruct the chargers to use this firmware.



Note: chargers will be told to update using the UWP-DLB as the source, they will not update when charging, they will not get the command to update if they are offline. It is advised that you reload the configuration page on UWP-DLB after 15 minutes, the firmware version at the top should have updated if successful to the new live firmware. You can upload multiple firmware files simultaneously, sending off multiple update requests using the appropriate chargers and selected firmware.

Check the OCPP debug log to spot problems or the response from chargers:



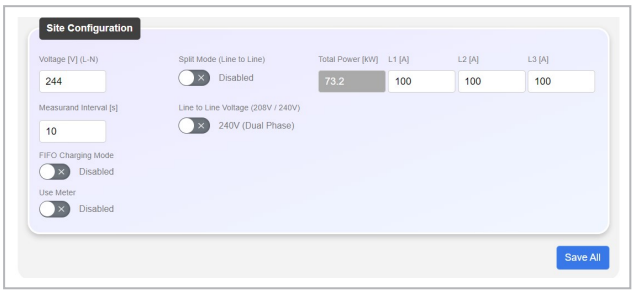
Set the site power usage

To perform load balancing, UWP-DLB needs to know the site voltage and the total amount of current available to the site. These two values are used in UWP-DLB's calculations.

You can find out the site voltage and total amount of available current from your energy supplier.

When you have this information, enter it into the UWP-DLB settings:

1. Log into the web interface.
2. Select **Configuration**.
3. In the **Site Configuration** section, enter the values for your site:

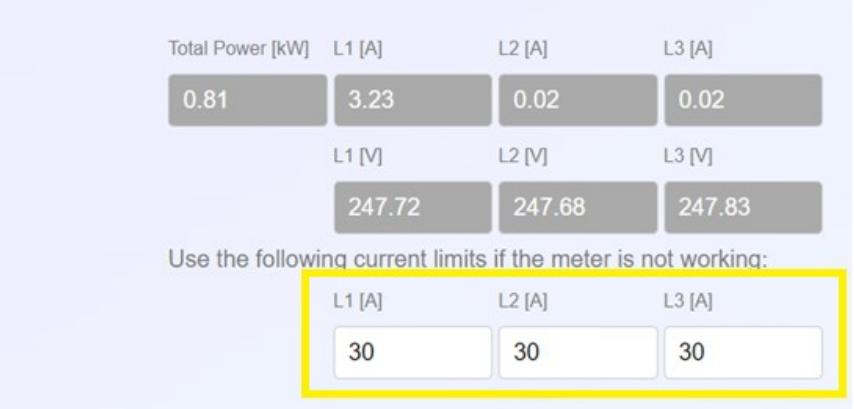


- **Voltage**. The voltage from L1 to N, normally 230 V AC, on three phase systems this is NOT the voltage between phases.
- **Amps on L1/L2/L3.** The amount of current that the site can use on each phase. You may want to reserve some on particular phases if that are connected to buildings lighting etc. which are connected to these.
- **Total Power (kW).** This is read-only, this shows an indication of the site power based on the voltage and current limits entered by the user.
- **Measurand Interval (s)**. The number of seconds between requested charger updates, used to calculate charger power consumption.
- **FIFO Charging Mode**. When enabled chargers will offer power on a first come first served basis, when power is not available any additional chargers will be paused until charging sessions have completed. This way active charging is done at full speed for some and paused until power is available to others. When disabled (default) power is evenly distributed to all charging sessions simultaneously, all sessions will get some power but with every subsequent new charging session active charging will become slower.
- **Use Meter**. If UWP-DLB should use an external meter to calculate power used by buildings lighting or other systems such as solar in its load balancing calculations. Meters can be connected on RS485 or TCP/IP Modbus. A configuration file should be loaded through the Assembler screen for the meter you are using.



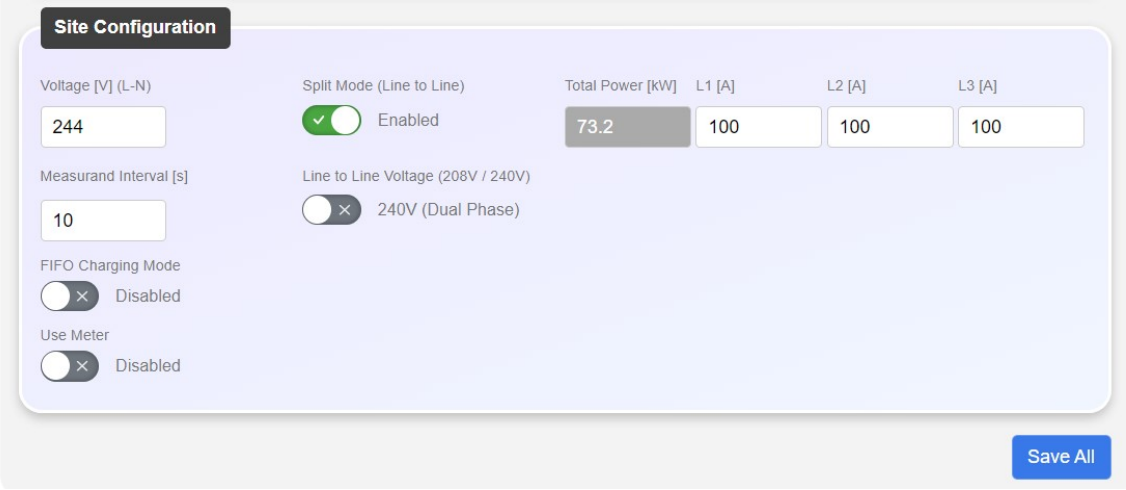
When enabled the meter configuration used can be shown, the meter readings are shown for the instantaneous values of the Current and Voltage on, L1, L2, L3 phases. When the voltage is read from the meter this is automatically used for the site voltage. When running on a single-phase system only VL1[V] has to be present, VL2[V] and VL3 [V] will be blank if they are not read or return 0. With this enabled the degraded mode limits are exposed, see **Degraded Mode**

- **Degraded Mode**. When a meter is enabled a second set of current limits are exposed, these allow the user to enter a lower charger limit in the event of the meter failing:



The default for this is 0 (charging disabled).

- **Split Mode (Line to Line)**. In North America chargers maybe wired across both 120 V phases of L1/L2 making a 240 V output. This charger measurands are duplicated in both phases in this mode, without this turned on the L2 phase will look unused by the chargers.

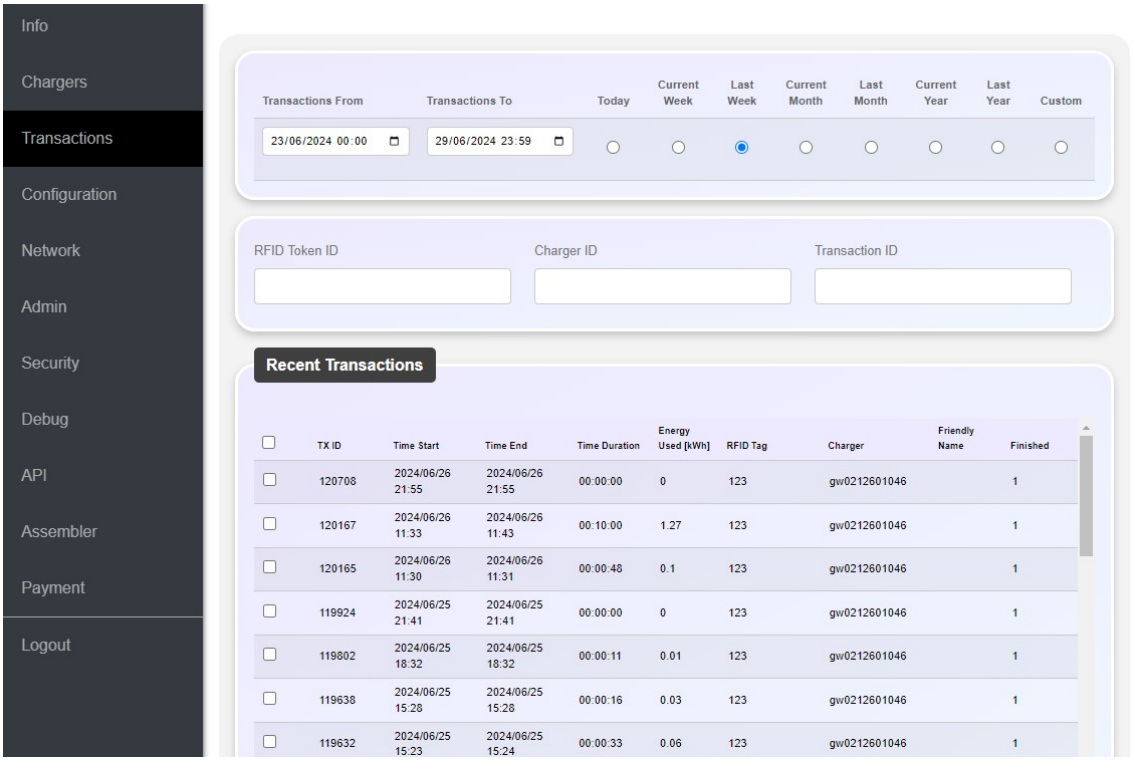


- **Line to line voltage (208V / 240V)**. Enable both Split mode and line to line to indicate that in North America the charger has been connected across two phases of a 120 V system with 3 phases. This results in a 208 V voltage and the charger configuration is limited to L1-L2, L2-L3 or L3-L1. With this option enabled the charger measurand values are duplicated into both phases.

4. Select **Save**.

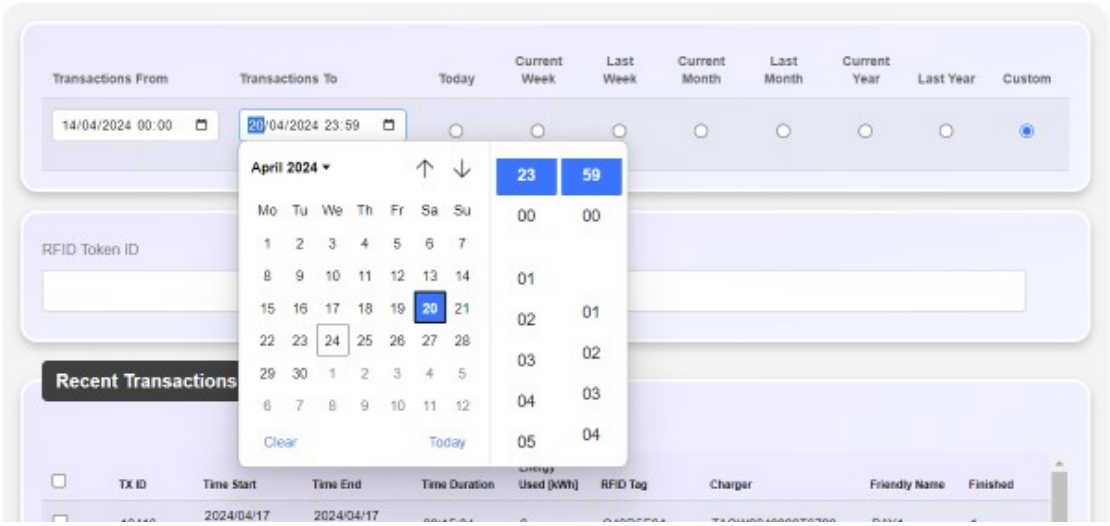
Charging Transactions

Historical charging sessions can be viewed and exported using the **Transactions** page. There are some quick select boxes for transactions that have completed today, this week (Mon-Sun), last week, current month, last month, current year and last year. All times shown are in the current time zone set for the UWP-DLB.

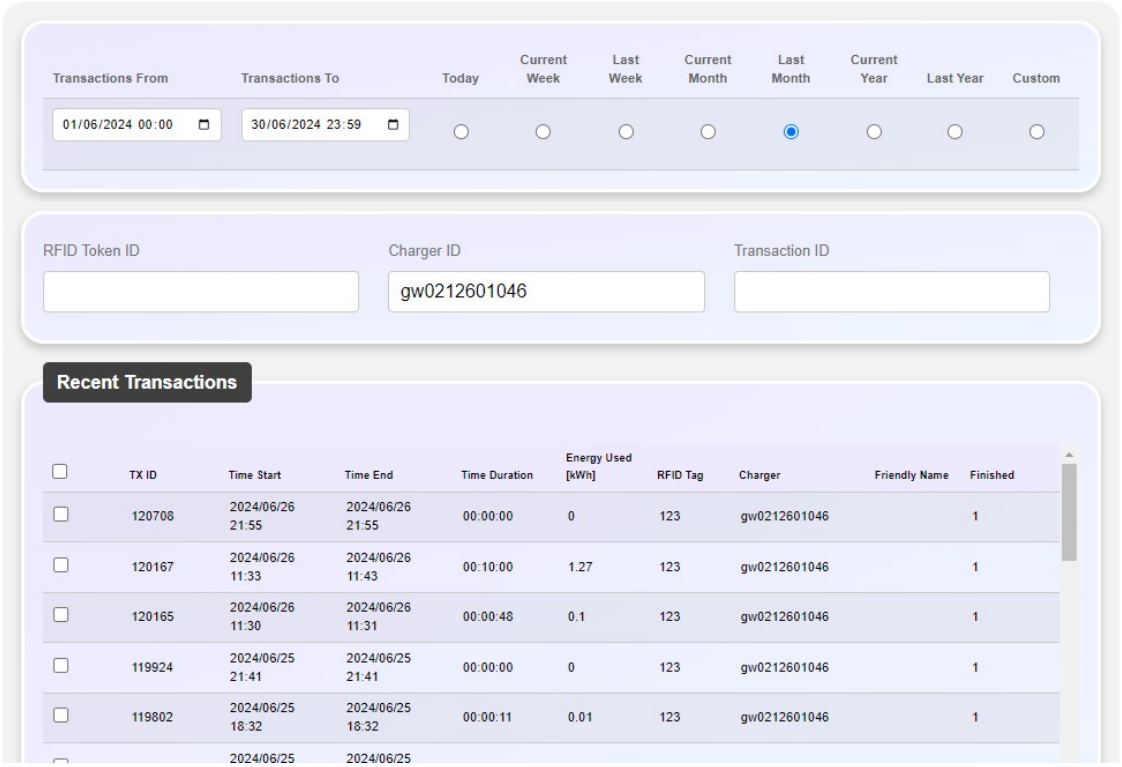


The RFID, Charger ID and Transaction ID filter boxes enable you to filter results also by these parameters.

If you are looking for another date or time range you can choose an exact day and time:

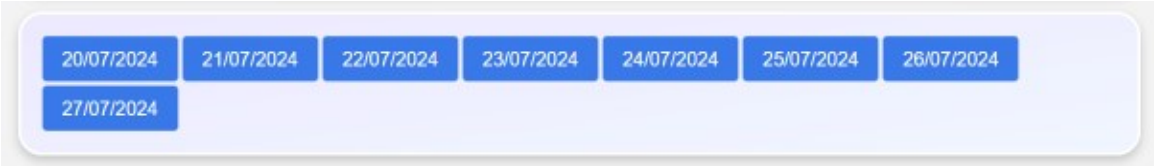


Transactions can be ordered by any of the columns by clicking on the heading, here is a sort for all transactions last month, filtering for the charger “gw0212601046” and then ordering of the energy used in descending order:

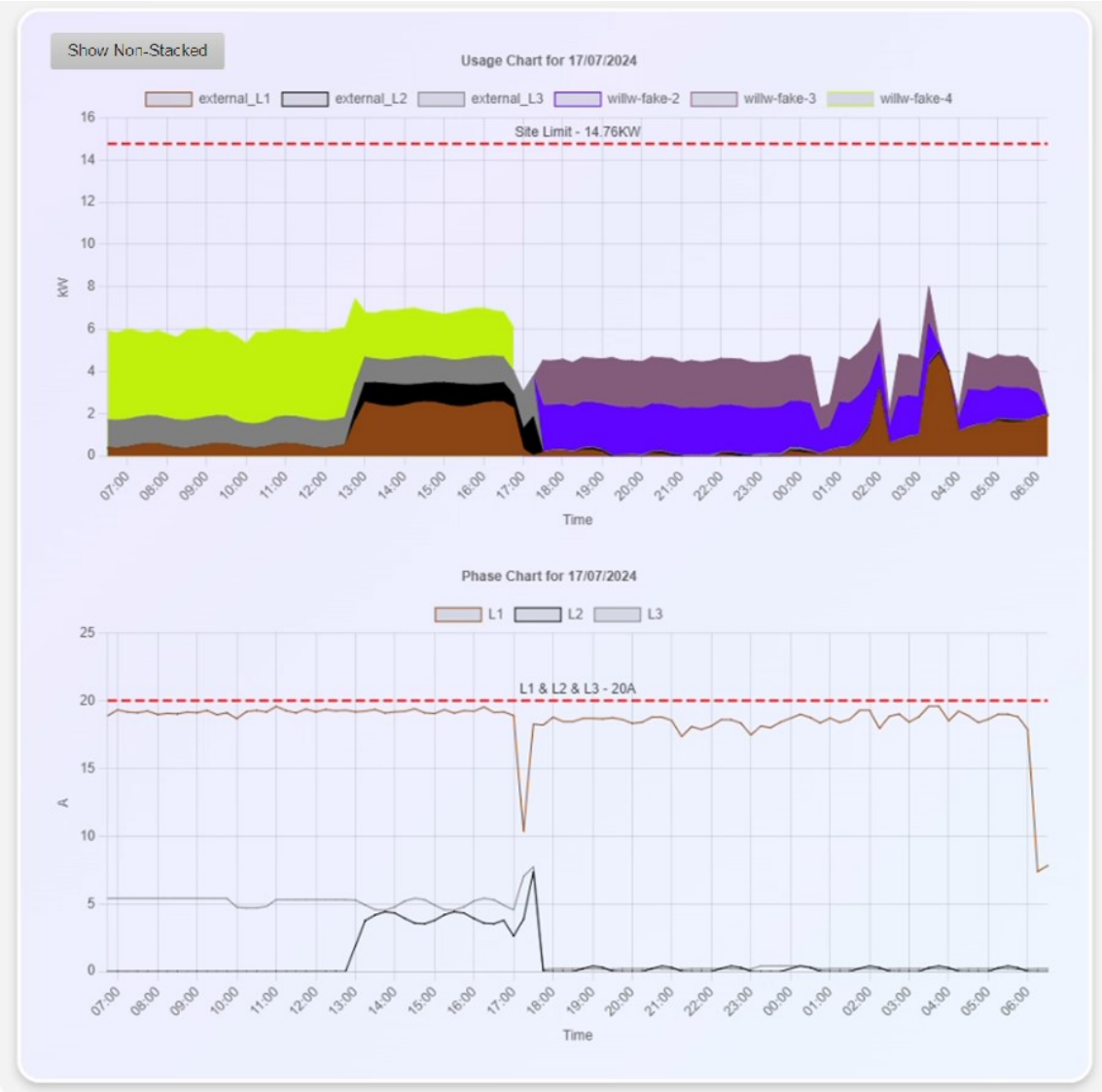


Note the filters need to be matched exactly, part of the charger’s name will not find all matches.

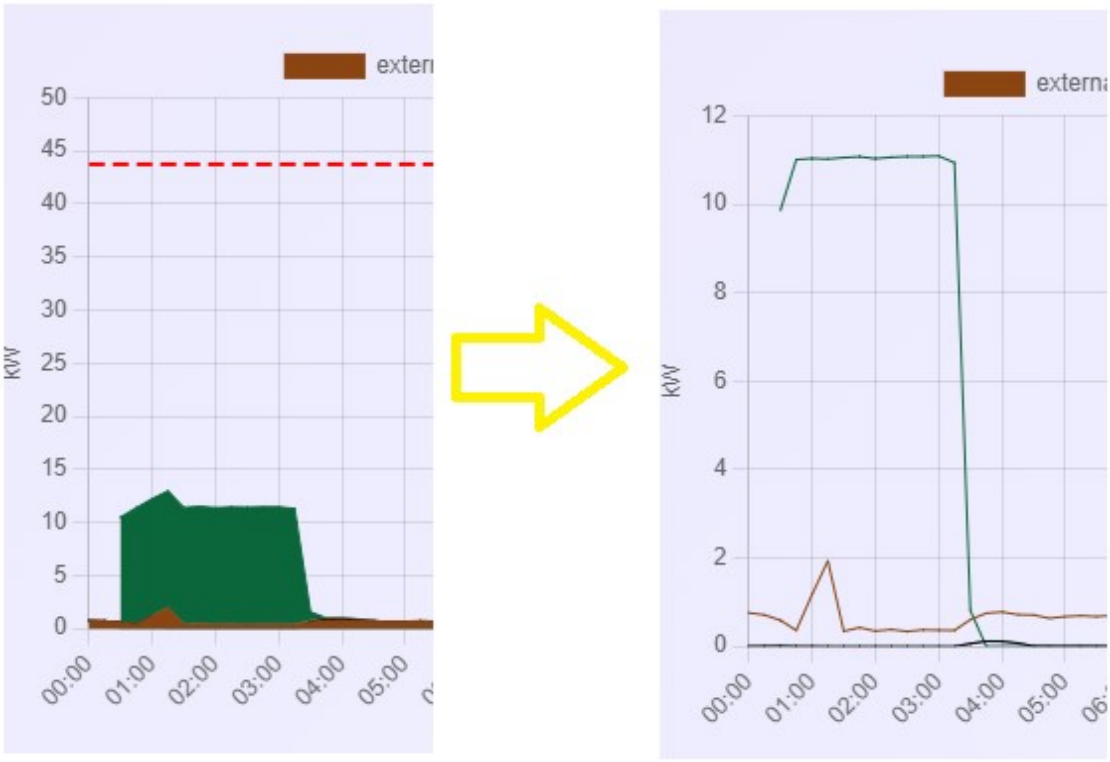
Site daily graphs can be shown by selecting the appropriate day from the selection you have searched for, up to a month can be loaded at a time, click on the day you want to view:



The site power and phases will be shown if a meter is present, without a meter the site power (top graph) is shown only. This is an important tool to check historic loading. Note that all power is averaged in 15-minute intervals, charging of less than 15 minutes may not show.



Clicking on “Show Non-Stacked” / “Show Stacked” toggles between a stacked or overlayed view of the Site usage.



The stacked view also includes the site limit and accumulates each charger on top of each other to give a site view.

The non-stacked shows each charger when charging from 0 to better show the per charger view.

Whitelists

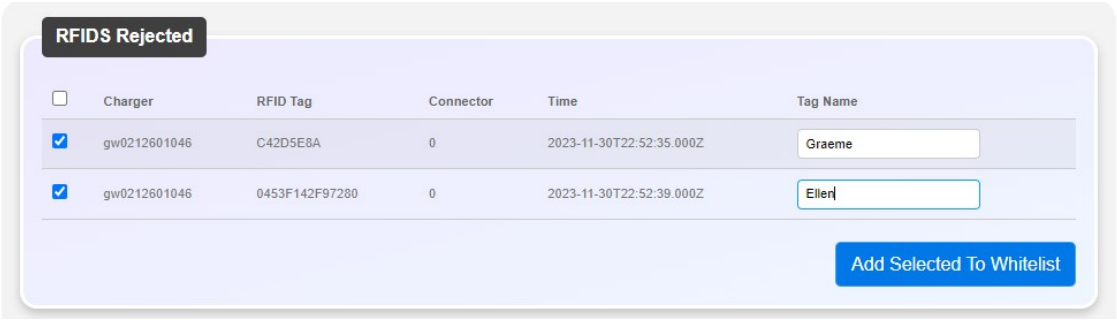
UWP-DLB can use a Whitelist to enable charging sessions from a list of RFID tags on any of the connected chargers found in the Transaction page.

To use this whitelist option UWP-DLB should not be connected to a CSMS, the “allow charging” in the configuration is enabled and the whitelist function enabled.

Without the whitelist being enabled all charging sessions will be accepted in the offline mode with any Token or RFID given by the charger.



RFID tags can be added to the whitelist in a number of ways. One way is to present the RFID tag to a connected charger, this will then show up in the RFIDs rejected list:

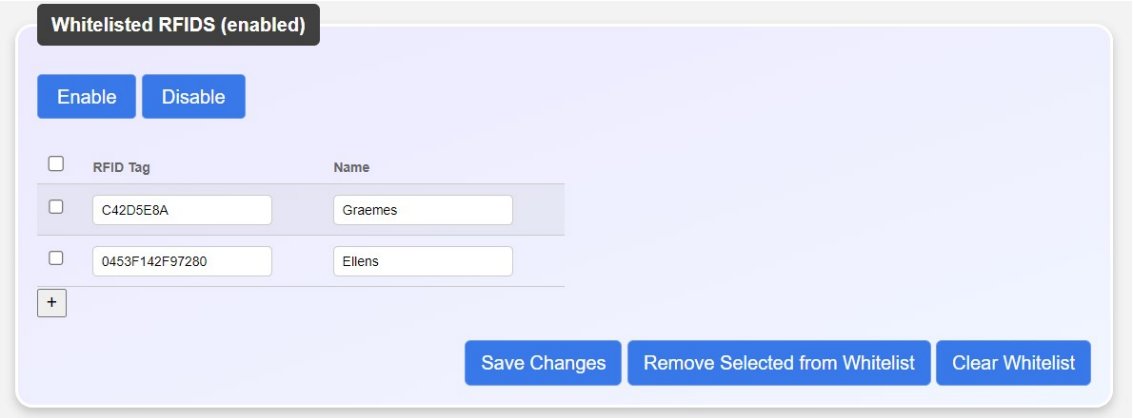


A descriptive name can be added and the “add selected to whitelist” button will save the tag. Note that the rejected tag will remain shown as it was rejected at that time and is part of the historical log even if it is whitelisted from now on.

A second way it to use the whitelist import/export feature:



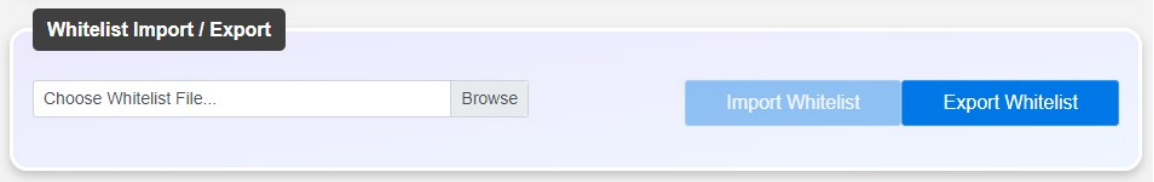
After adding the RFID tags can be edited, selected and deleted or the entire list cleared:



Users can add tags manually using the '+' button, type the tag number and name and save to add.



Or export outputs the RFID tags as a CSV file for saving or later importing in other UWP-DLB devices.



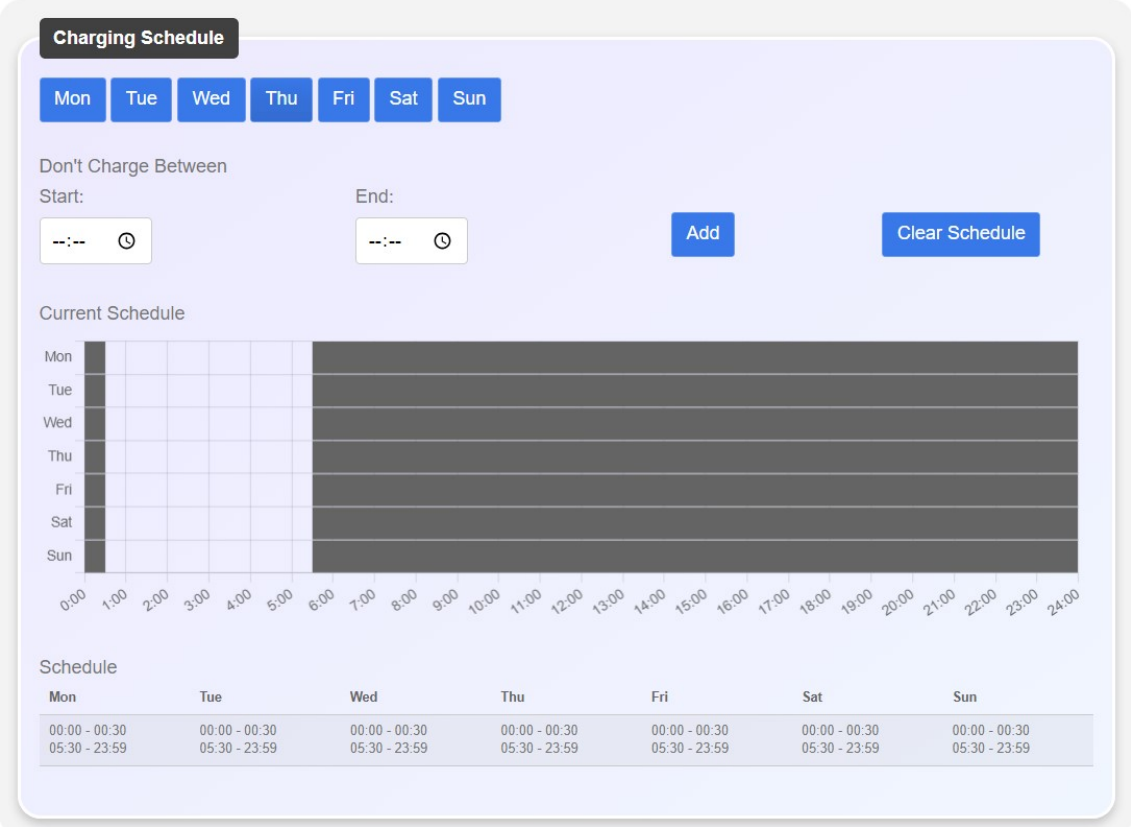
Example CSV:

0453F142F97280,Ellen

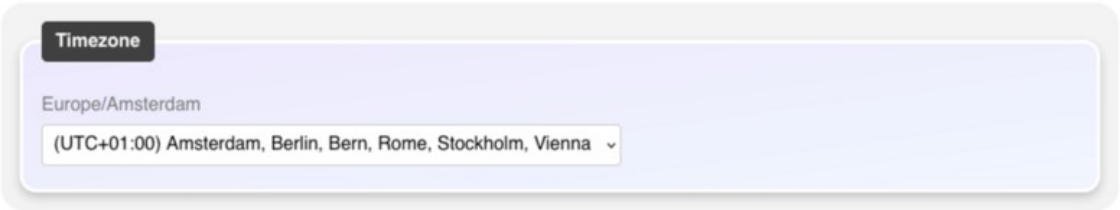
C42D5E8A,Graeme

Charging times and Time Zones

UWP-DLB supports setting a series of profiles that will exclude charging on *all chargers* between specific times. The times can be controlled on a Mon-Sun basis, allowing you to set charging exclusions for weekdays, weekends or other combinations. The **Configuration** page includes this:



Ensure that the time zone is set to the correct for your region as this is used for timing schedules:



Importing and Exporting Settings

UWP-DLB supports saving the current configuration and importing this onto a new device or the same device in the future to restore settings.

The export includes:

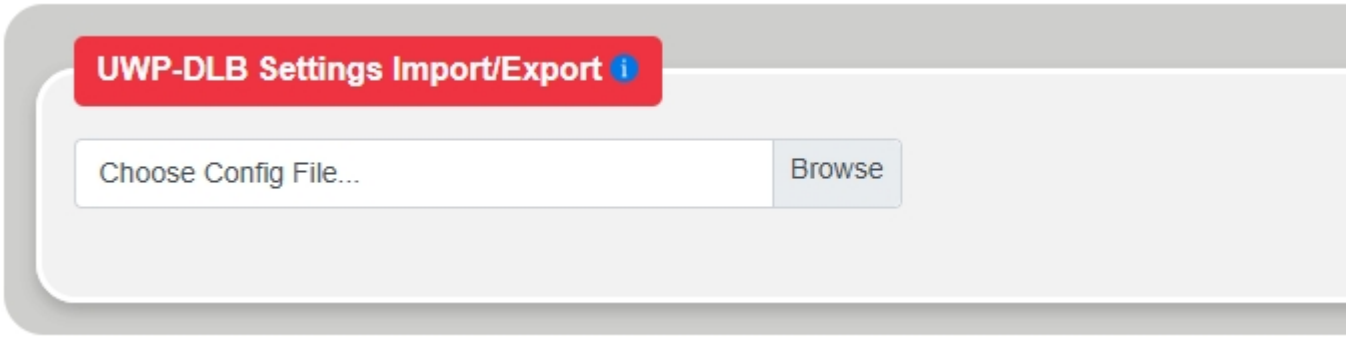
- Charger configuration (phase info/friendly name/groups)
- All group settings
- CSMS settings
- Site configuration
- Charging schedule
- Firmware update settings and URLs

What it doesn't include:

Branding packs

- Meter configuration
- Network configuration
- UWP-DLB license

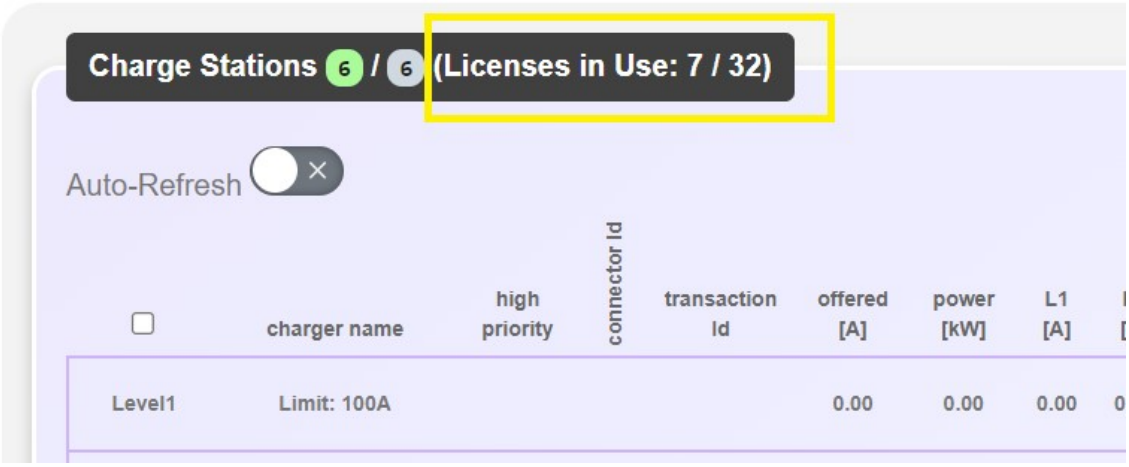
This is available in the Configuration page:



UWP-DLB Licensing

UWP-DLB contains a limit to the number of chargers and/or connectors that can be attached.

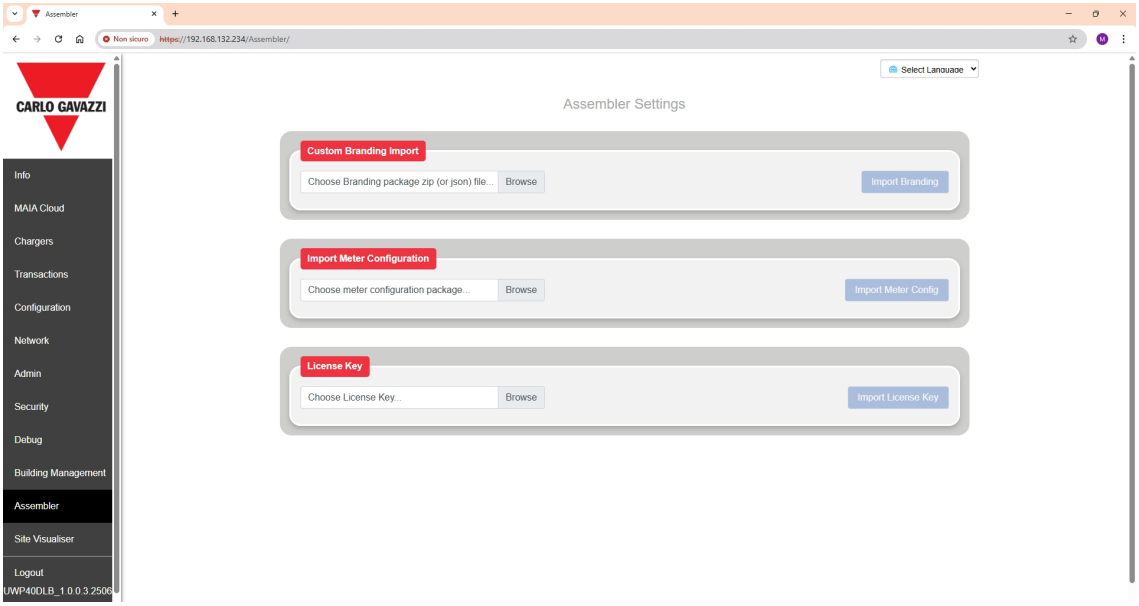
The **Info** page show the count under the charge stations:



In the above example 32 chargers or connectors are allowed. This can be for instance 16 x dual socket chargers, 32 single socket chargers or other combinations.

The first set of numbers 6 / 6 indicates the number of configured and connected chargers.

If a new UWP-DLB license is issued as an upgrade from Carlo Gavazzi support, this can be imported in the **Assembler** page:



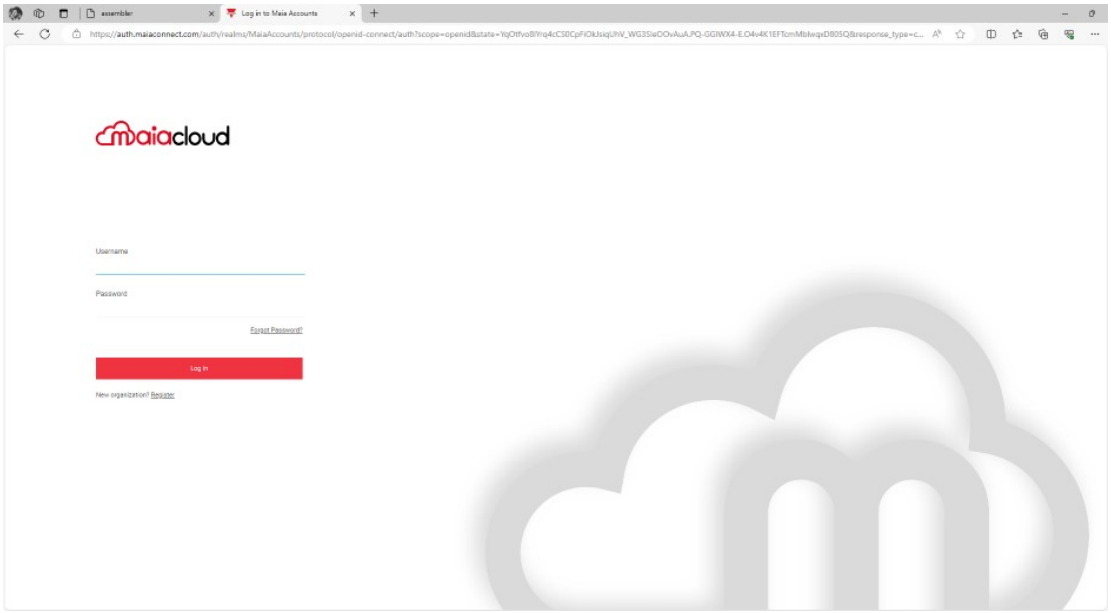
Remote Access to UWP-DLB devices through the MAIACloud

Customers can monitor devices availability, configure and update firmware remotely using this feature. Other examples would be to access a UWP-DLB in the field to change site power limits, download transaction logs or add RFIDs to whitelists.

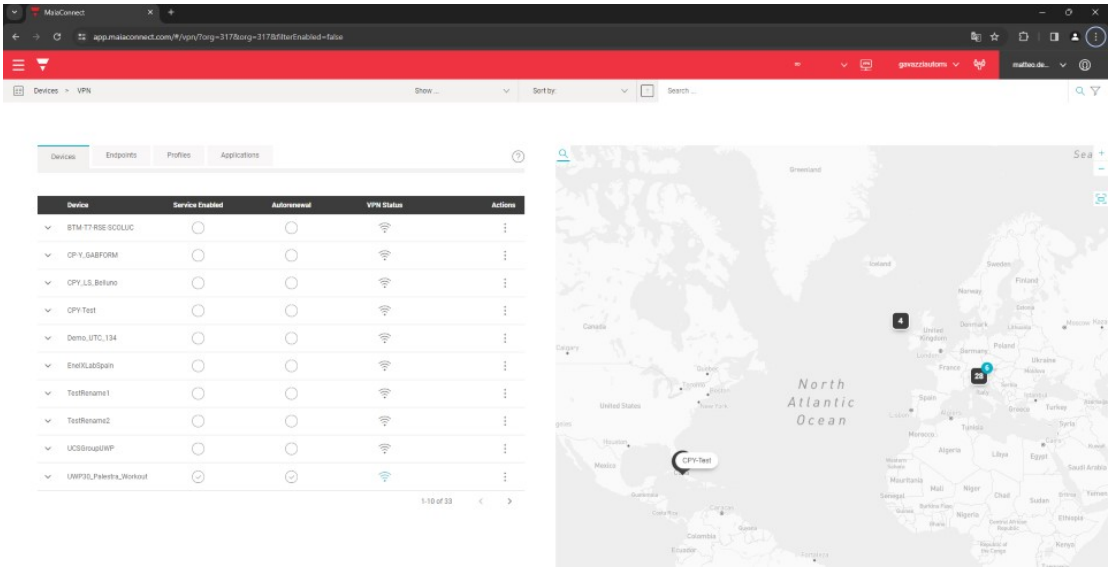
To access you will be given an account and password. Using this navigate to the link.

https://app.maiaconnect.com

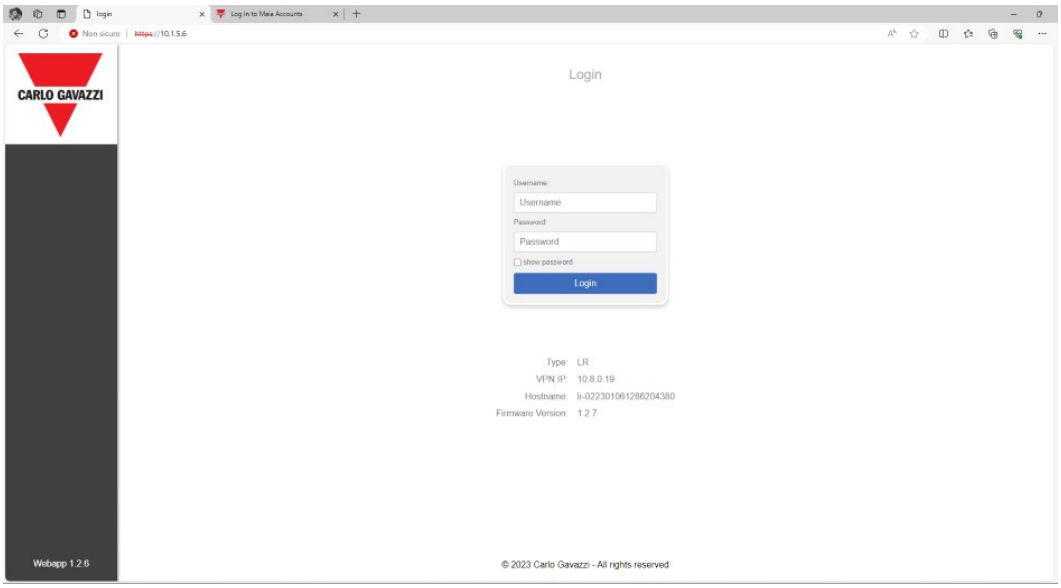
You will be presented with your login details given to you from Carlo Gavazzi support:



Enter your account details, you will then see devices you have on your accounts:



Clicking on the device name will open a tab and take you directly to the login page for that device. The current status last connected and created information are available in the event of a problem.



Uncontactable Chargers / Meters and Load Balancing

If a charger is added to the configuration but connection is lost, the load balancing algorithm assumes that it is still functioning and the site power maybe exceeded if we don’t consider it in the calculations unless there is a meter connected to UWP-DLB that does this is not the case.

For example, we have 100 A for the site budget and 5 x 32 A chargers. If one of the chargers is turned off / removed or communications drop to it, UWP-DLB will assume it still maybe in use and will reduce the budget from 100 A to 68 A for the other chargers (with no meter)

If this unit is permanently not to be included in the load balancing it should be removed using the UI on the /Info page, freeing up this 32 A back into the pool.

When a meter is connected and functioning, UWP-DLB will ignore any chargers that aren’t connected as the site is being safely monitored through the connected meter.

If the meter is configured but not functioning UWP-DLB will not allow charging; in this case it is important to repair the meter/connection, or if the meter is intentionally removed review the static power requirements and disable the meter option in UWP-DLB.

If there are groups of chargers configured in the system and there isn't an energy meter connected, when a charger goes offline, the system reduces power from the group budget as if the charger were in use.

UWP-DLB load balancing configuration

UWP-DLB can load balance using either an external Modbus meter (dynamically) or from the total site power budget and connected chargers alone (static) where there is no meter available.

Using the site without a connected meter

UWP-DLB can be configured without an external meter, this will calculate load balancing based on the maximum site power allowed and the connected chargers alone.

If other buildings/systems are likely to take power from this budget, then these should be subtracted from the maximum to allow a safe limit of power.

Using the site with a connected meter

If there is a connected external meter, UWP-DLB will use this to calculate any power differences between the available site power and the connected chargers.

UWP-DLB supports RS485 and TCP IP Modbus but needs a configuration file for the target meter. Contact Carlo Gavazzi support for more information on external meters.

Note reading of the voltage is optional on the meter, if it is configured UWP-DLB will use this for calculations rather than any set value, however.

The following are example of load balancing setups

Scenario 1 – A 3 phase site with an even amount per phase available for chargers, all chargers are single phase AC 7.2 kW chargers.

The site has 200 A per phase so the entered site limit would be 600 A.

All chargers have their settings for Single Phase and the Leg (Phase) they are connected to along with their max current, normally 32 A.

UWP-DLB would read the current used on all chargers. Any active chargers on L1/L2/L3 would be load balanced up to a maximum of 200 A per phase.

All idle chargers and chargers using less than their offered current will have their currents shared out to other chargers and their offer reduced. For instance, 24 A being offered to a charger which is only using 12 A may be subsequently offered 14 A. This balancing may take a short while to settle in an active system.

Scenario 2 – A 3 phase site with an even amount per phase available for chargers, all chargers are single phase AC 7 kW chargers, a building is on the site and an external meter is present.

The site has 200 A per phase, the entered site limit would give us a total of 600 A.

All chargers have their settings for Single Phase and the Leg (Phase) they are connected to along with their max current, normally 32 A.

UWP-DLB would read the current used on all chargers. Any active chargers on L1/L2/L3 would be load balanced up to a maximum of 200 A per phase minus any amount that the building is using. This usage is calculated as the site maximum minus any usage that the meter indicates that isn't already accounted for on the active chargers.

All idle chargers and chargers using less than their offered current will have their currents shared out to other chargers and their offer reduced. For instance, 24 A being offered to a charger which is only using 12 A may be subsequently offered 14 A. This balancing may take a short while to settle in an active system.

Load Balancing FAQs

The following section explains how UWP-DLB shares the available power, and what circumstances can affect the load balancing calculations:

How does UWP-DLB share the available power between chargers?

When the UWP-DLB has calculated the available power, it will initially give all active chargers an equal share of that power based on percentage of their maximum power output regardless of AC or DC, single or three phase.

Any active chargers not using their limit will have their offering reduced and the surplus given to other active chargers.

Using an external meter, the site usage power is taken away from the total budget and the remaining power given to the active chargers. If the site usage goes up the amount given to chargers is reduced, the meter is monitored every second for changes and measurands from the chargers are configurable (default is 10 seconds). Profile updates are sent immediately as the power goes over, if the building usage goes down UWP-DLB then waits 30-60 seconds to adjust chargers back up again, this delay allows us to deal with fluctuating power.

Does UWP-DLB monitor L1/L2/L3 separately?

L1/L2/L3 are monitored where the charger reports on these individually, otherwise the assumption is that three phases are equal when no information is returned by the charger.

Is DC efficiency taken into account?

DC charger efficiency is calculated by looking at the power offered, and subsequent power taken, any power over the offering is calculated as the AC > DC efficiency.

What if the chargers are trying to use more power than is available?

If the chargers request more power than is available, UWP-DLB will instruct the chargers to use less power. UWP-DLB checks the power requests of the chargers every second.

What happens when there is more power available?

UWP-DLB actively monitors the power requests and the amount of available power. If there is a surplus of power available, UWP-DLB will:

1. Check to see if there were any new charge profiles (requests for charging).
2. If there were no charge profiles, UWP-DLB instructs the chargers that they can use more power. (If there were new charge profiles, there would be no changes to the amount of power each charger can use).

What happens when one or more devices are not using all their offered power?

UWP-DLB actively monitors the power used by chargers, when their usage is considerably lower than their offered amount the offering will be reduced and distributed to other active devices.

How do I apply a safety margin for the power consumption?

If you need to add a safety margin for power consumption, reduce the overall site power.

For example, if the site is set to 100 A total power, and you need a 10A safety margin, reduce the total power to 90A.

Do offline chargers affect the load balancing calculations?

Yes, when there is no meter present, chargers that are offline are assumed to be charging and so affect the available power calculation. When there is a meter UWP-DLB can see the site load and isn't reliant on all its reading coming from the connected chargers.

If you have any permanently unavailable chargers, you should remove them from the list of chargers.

When a CSMS goes offline what happens to in progress charging sessions?

If the CSMS is uncontactable UWP-DLB will buffer messages, when the CSMS is available again all messages are uploaded.

Message memory is intended to supply 24 hours of backup for active connections. If the CSMS remains uncontactable new messages will be discarded after memory eventually fills up.

If a site meter fails with communications to UWP-DLB what happens?

If a meter fails communications, UWP-DLB uses half the total used for charging at the point of failure. This will continue until the meter communications are restored.

So, for instance the site limit is 100 A, the meter is showing that the building is using 10 A, leaving 90 A for charging, but only 40 A are being actively used for charging. Communications are then lost to the meter, UWP-DLB will allow up to 20 A (half the active 40 A) for charging leaving a safe margin for the building until the meter is restored.

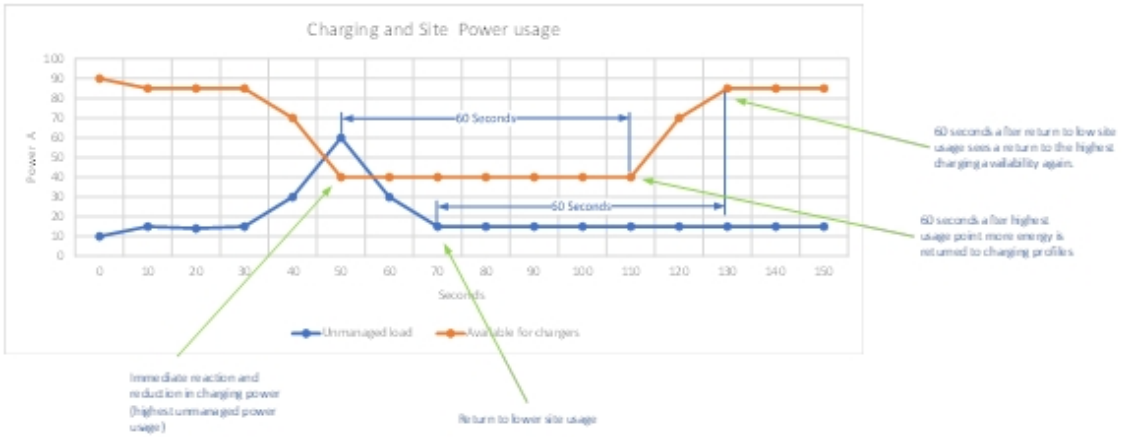
Note that if UWP-DLB is reset with the meter communications in a failed state or if the meter fails when no charging is being performed then no power will be allowed for charging until the meter communications are restored or until the meter is disabled.

With an external meter power how fast is power reduced to chargers?

The external meter is read every second, the chargers report their power at the rate of the measurands (default 10 seconds, lowest setting is 5 seconds). The chargers aren't expected to quickly increase their power output but ramp usage, any fast changes at the site using unmanaged power will be seen within 1-2 seconds, chargers are immediately told to offer less power. This results in having a total response time of 2-4 seconds from spike to reduction.

Power is increased after the maximum site usage falls for a rolling 60 seconds similar to a high-water mark, this is done to reduce offerings to the charger from changing too frequently.

In a simple example of a site using more power, then reducing again this affects charging like so:



How does FIFO charging work?

When enabled chargers are given full power whilst power is available, for instance at a site with 3 chargers (32 A single phase), and a site limit of 64 A.

Charger 1 session starts – This is offered 32 A

Charger 2 session starts – This is offered 32 A

Charger 3 session starts – This is offered 0 A (as no power is available)

Charger 1 session stops (either the charge session completed or the car draws no power)

Charger 3 is offered 32 A

With an external meter charger offering will be adapted with the building load in addition to this behaviour. Any chargers set to priority will be given power first (again in FIFO order) over normal priority FIFO chargers.

How does priority charging work?

Priority charging will give power to any chargers set to high priority first. If there is any left over power it will be given to normal priority chargers.

If there is not enough power at the high priority level power will be evenly distributed between high priority chargers.

If a charger is charging but is not using its offered amount, after approx. one minute its power will be distributed to other chargers in the same priory band or lower as appropriate.

Define how often UWP-DLB monitors the EV chargers for status

The UWP-DLB will receive data from the EV chargers at regular intervals. You can set the interval in the **Info** settings.

1. Navigate to the **Configuration** page.
2. Use the **Measurand Interval (Seconds)** setting to define how often UWP-DLB requests data from the EV chargers the minimum allowable is 5 seconds.

When setting the interval, it is important to get a reasonable balance. Longer intervals give more useful power usage readings, while shorter intervals provide more up-to-date readings. We recommend the default interval of 10 seconds for most sites.

Define what happens when UWP-DLB cannot communicate with the CSMS

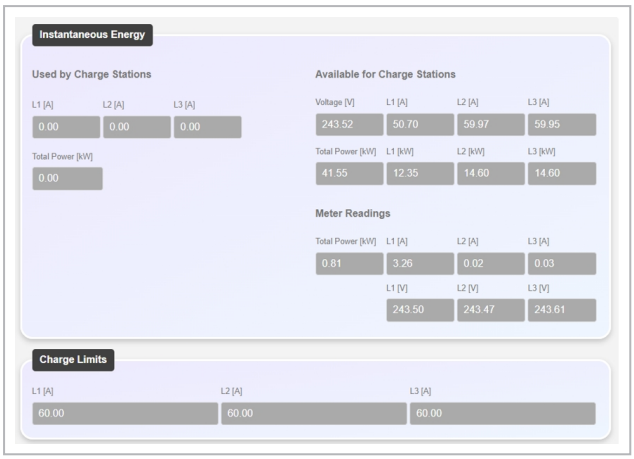
There may be times where your UWP-DLB cannot communicate with your CSMS (Charging Station Management System). For example, if the internet service is down and communications are temporarily lost. You can use the UWP-DLB settings to define what happens in these situations.

1. Navigate to the **Configuration** page.
2. Use the **Allow New Charging** switch to control what happens when UWP-DLB cannot communicate with a CSMS:
   - **Enabled (Default)**. The UWP-DLB will allow new charge requests from vehicles when disconnected from the CSMS, either allowing all devices or those in the whitelist (depending on if whitelist is enabled or not).
   - **Disabled**. The UWP-DLB will allow any existing charging to continue but will prevent new charging sessions from being started.
3. Select **Save**.

   Note when not using a CSMS make sure you enable “Allow New Charging when CSMS offline” as this is the mode you will be operating in.

View the current charge and available charge

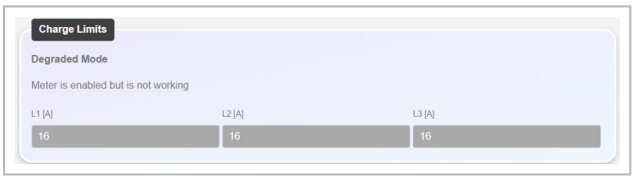
The **Info** page has information about the instantaneous energy available and used:



On the left the power used by charge stations is shown in both A and combined Kw.

On the right is shown the available for charge stations. This is shown in both A and kW for ease of use. The total available for use by chargers is either the site limit if no meter is used or when an external meter is available this is calculated from the site limit minus any non-charger power consumption. The current L1 Voltage to N is also shown.

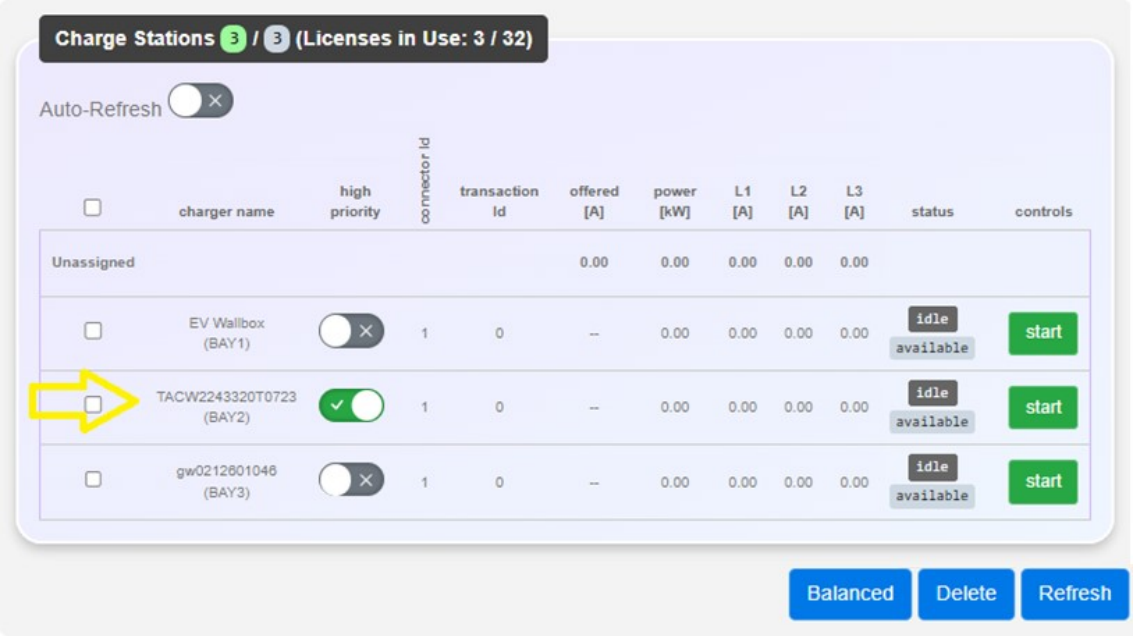
When a meter is enabled the Meter Readings are shown. The total site limits are shown below this in “Charge Limits”, if the meter is enabled but functioning it will show the degraded mode limits (defaulting to 0 unless configured otherwise):



Information and control of chargers

To remove a charger from the load balancing pool and set it to maximum power:

1. Navigate to the **Info** page.
2. In the **Chargers** section, find the row for the charger you want to control.
3. Use the **Priority** switch to toggle a charger between normal and high priority.
   - High priority means the UWP-DLB will give power these chargers in preference to normal priority chargers.



On this screen is listed also:

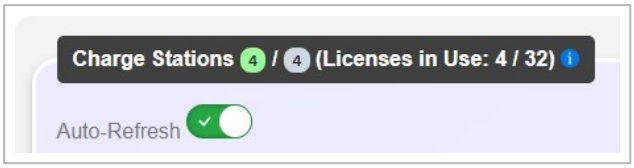
- Charger ID and friendly name
- Transaction IDs for chargers
- Current offered (per phase)
- Total power and individual phase currents consumed
- Status of the charger
- Group (if chargers are grouped at all otherwise “Unassigned”)
- Start/Stop for manual control

Auto Update

To start

1. Navigate to the **Info** page.

2. In the **Chargers** section, check the box for Auto-Update

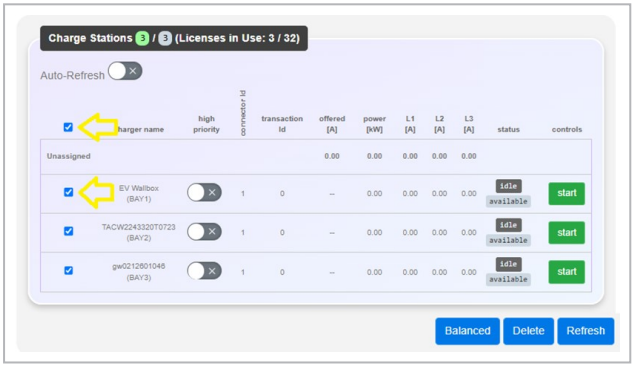


This will poll UWP-DLB every 3 seconds for changes to the charger status and instantaneous energy values.

Multiple charger configuration changes (bulk control)

To take control of multiple chargers manually, rather than control them individually:

1. Navigate to the **Info**page.
2. In the **Chargers** section, check the box for each charger that you want to control. You can select one or more chargers. To select them all at once, check the box at the top of the list.



3. Use the buttons above the list to issue a command:

- **Balanced**

To set the UWP-DLB to return any selected chargers to normal from high priority.

- **Delete**

Deletes the selected chargers from the UWP-DLB. To remove them completely, you will need to reconfigure the chargers.

- **Refresh**

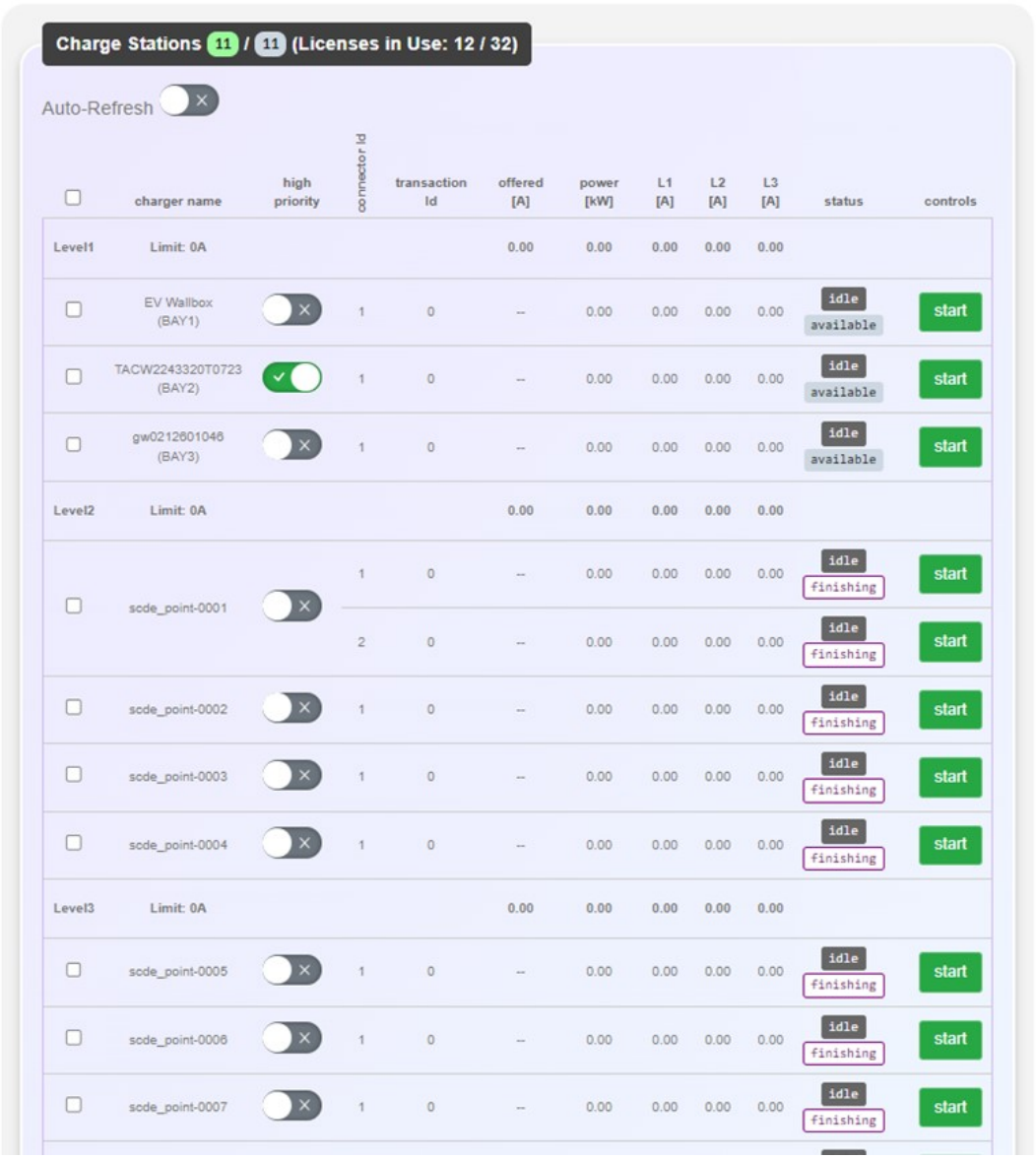
Reloads the web page view. This can be useful to manually refresh if required.

Delete a charger

Every charger that is set up to connect to the UWP-DLB as its CSMS is listed in the **Chargers** section on the **Info** page. When UWP-DLB calculates the available power, it considers all of the chargers as capable of charging, including those that are offline. For this reason, it is a good idea to delete any chargers that are connected to UWP-DLB but are no longer in use. If you do not disconnect them, they will continue to affect the load sharing, even though they are not used for charging.

Group Control

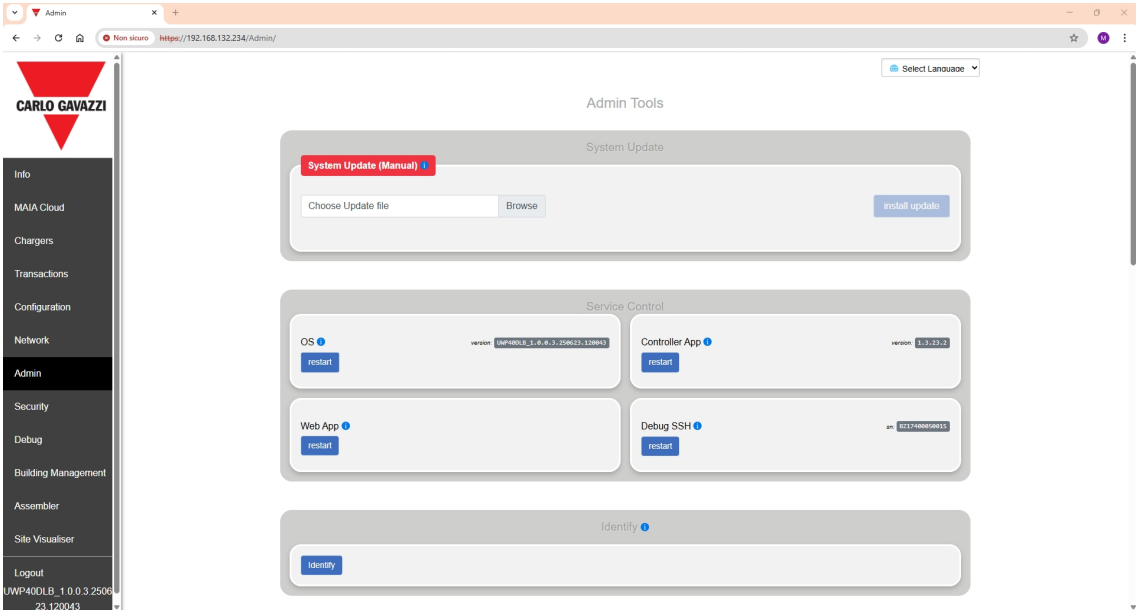
When chargers are grouped into separate groups the info screen shows each group, the chargers in the group and totals for the group:



In the example above there are a number of groups with limits of 50 A, 100 A, a mix of AC and DC chargers in different groups in different states.

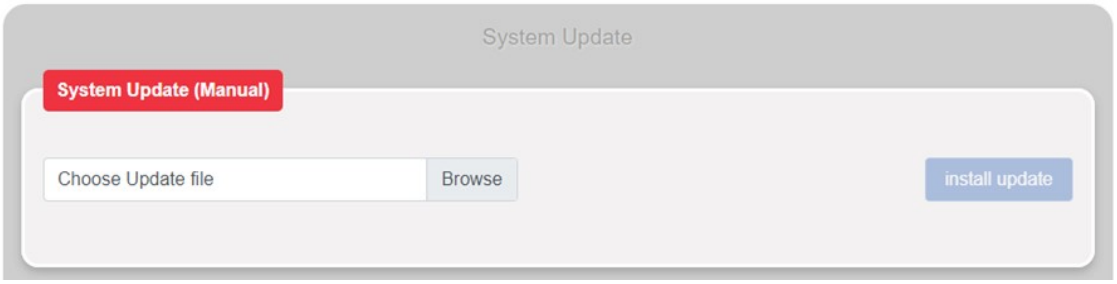
Admin and System Update

The **Admin** page is intended for system update, restarting and downloading of log messages.



System Update (Manual)

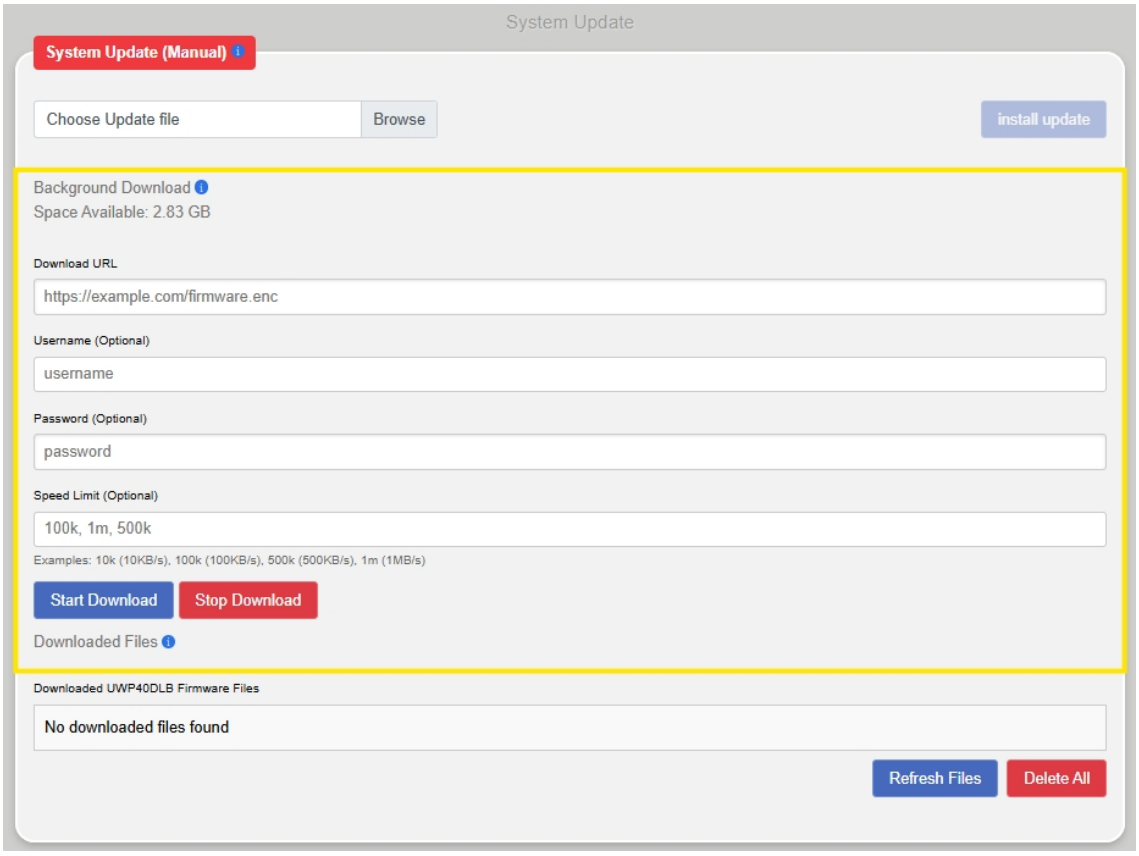
Installing a firmware update can be performed by clicking on the “browse” button, and navigating to your update file, note this will be a .bin file:



Then select **Upload File** to upload and perform the update. The update may take up to 10 minutes to complete, the system should automatically reboot afterwards. **Note** Do Not reboot the system within this time, doing so may result in permanent software failure.

System Update (Background)

On very slow cellular connections the firmware upload above may fail, if this happens you can store the firmware file on a server and enter the HTTP(S) address into the background downloader, UWP-DLB will download the firmware slowly, retrying and resuming on any failures:



You do not need to be connected when downloading, after complete the file will show up in the downloaded UWP-DLB firmware files section at the bottom, ready for install.

Service Control

This allows the user to reset parts of the UWP-DLB system, it can be used if you experience problems:

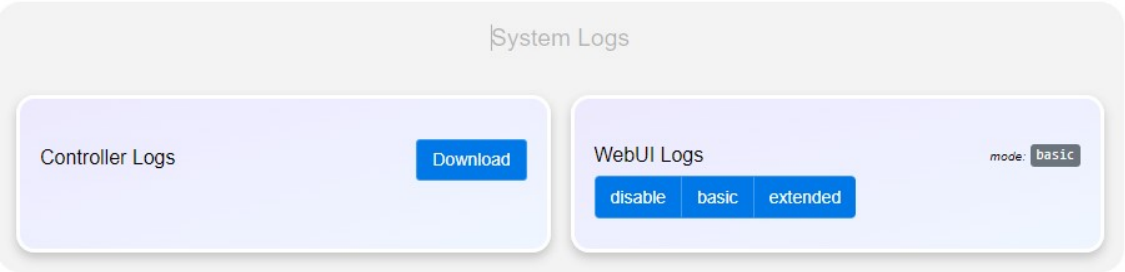
1. OS
   - Restarting this will reboot the board and all the software, all user settings are retained.
2. Controller App
   - Restarting this will restart only the load balancing application.
3. Web App
   - Restarting this will restart the web server element.
4. Debug SSH
   - Factory Diagnostics mode, not accessible to customers.

If you are experiencing problems restarting the UWP-DLB element is the quickest route, any further issues restarting the OS is a more complete solution.

System Logs

If requested by a service engineer you can download and email the UWP-DLB logs using this feature.

The logs default to storing basic information, it may be use for support to enable extended logs, these capture much more information but wrap quickly so are only useful for capturing specific events.

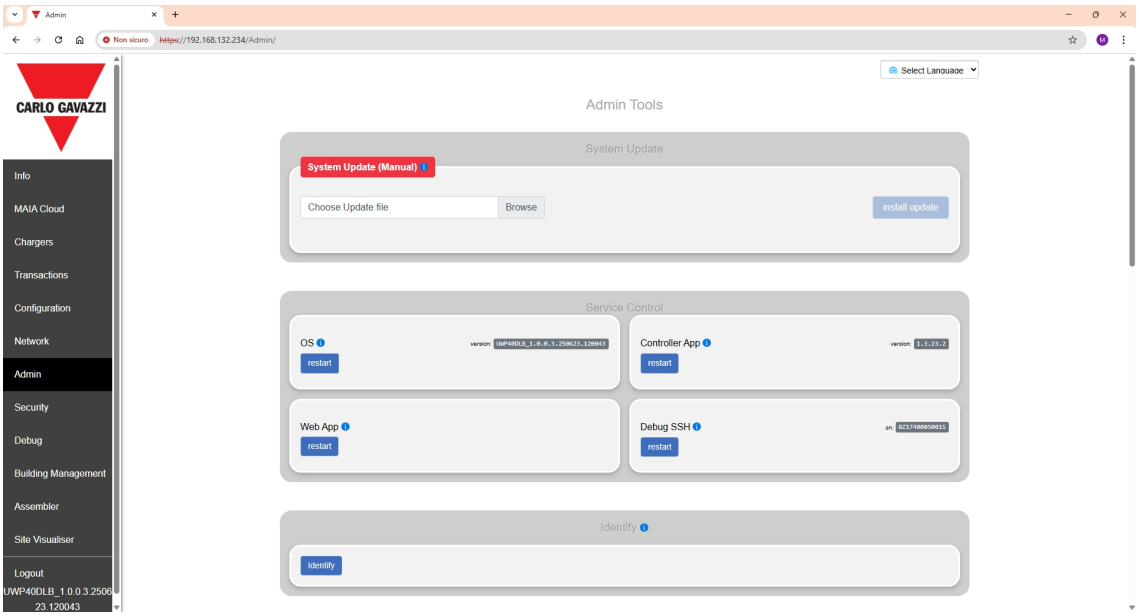

System Logs
Controller Logs
Download
WebUI Logs
mode: basic
disable
basic
extended

LEDs and reset

To reset the UWP-DLB to factory settings, you need to contact CG technical support and provide the device's serial number. A file will be sent to you, which must be loaded onto a USB drive and inserted into the UWP slot.

Once the authenticity of the file is verified, the UWP will perform the reset and restart, returning to its factory settings.

The user can flash the LEDs to identify units in a rack, to do this go to the Admin page and use the **Identify** button:

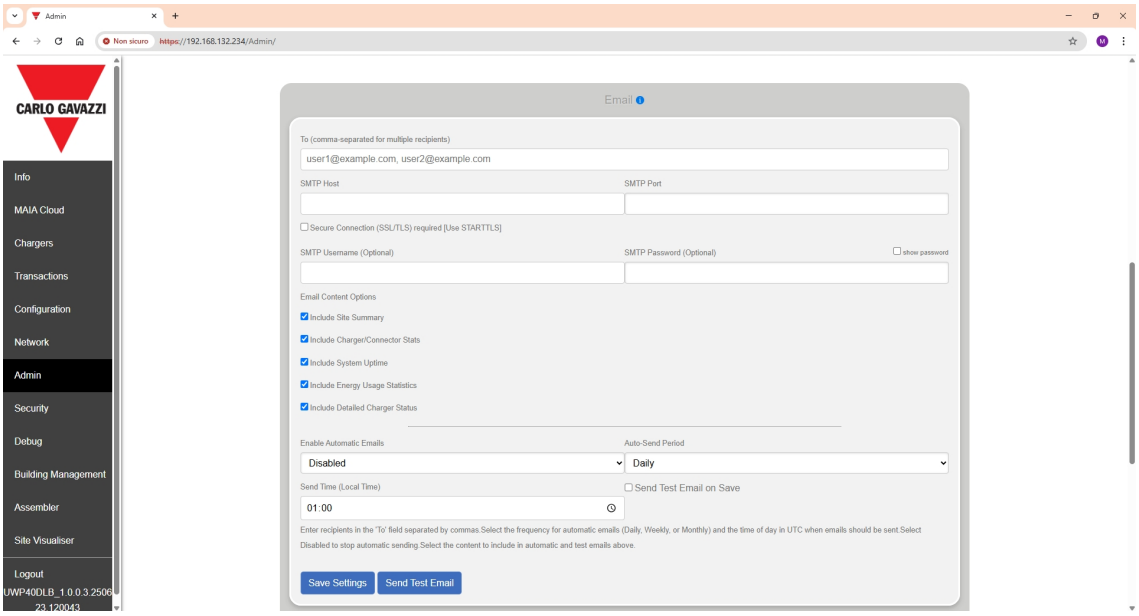


Email Report and Email Notifications

UWP-DLB can generate periodic email reports showing uptime, connectivity, charging sessions, power used and other transaction activity.

Notification emails are also sent when events such as Boot/Charger/Meter/CSMS changes are found.

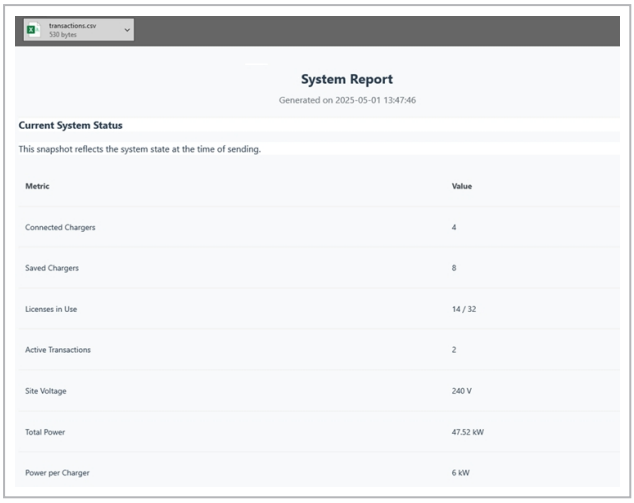
User the Admin tab the user needs to enter an SMTP server to relay these messages, below is shown a gmail server configuration:



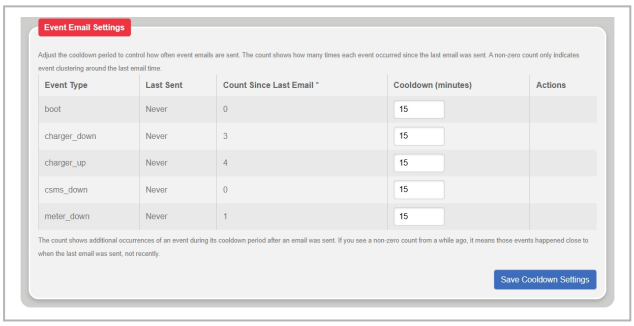
***Note** when using a gmail as 2FA will be enabled an "app password" has to be obtained from https://myaccount.google.com/apppasswords which can then be entered into the SMTP password section to use this account to relay SMTP message on behalf of the senders google account.*

Email Report / Notifications

A test email can be generated; this will include the transaction as a CSV file and a HTML report for example:



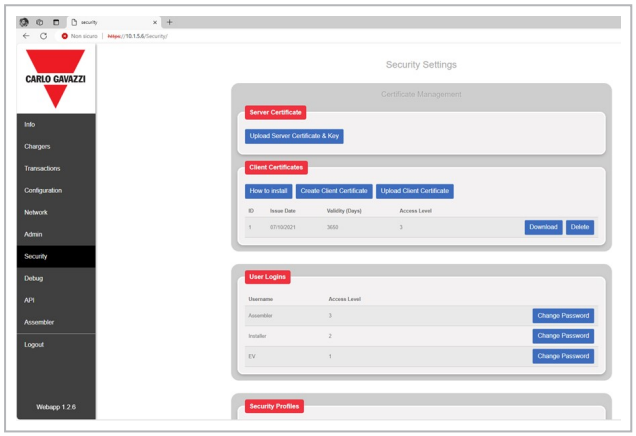
Email notifications have cooldown times included, these stop spamming of emails when repeated events happen, for example a charger resetting will produce an initial email, but with a cooldown setting of 15 minutes, another email will not be sent out for this notification for at least 15 minutes. These values can be adjusted.



Security

The **Security** settings allow you to create and manage the security certificates and change the password for each type of user.

1. Navigate to the **Security** page.



2. Use the **Security** settings to:
    - Upload a server certificate and key
    - Change a user password.

NOTICE

The client certificate settings are designed for future use as part of a 2FA (2 factor authentication) solution. This is not currently supported by the UWP-DLB.

Upload a server certificate and key

If your UWP-DLB does not have a security certificate, you will get a warning each time you try to log in to the UWP-DLB web interface. To prevent this from happening, log in as an assembler and then create and upload a server certificate.

Change a user password

To change the password for a user:

1. Navigate to the **Security** page.
2. In the **User Logins** section, select the **Change Password** button for the user account you want to update.



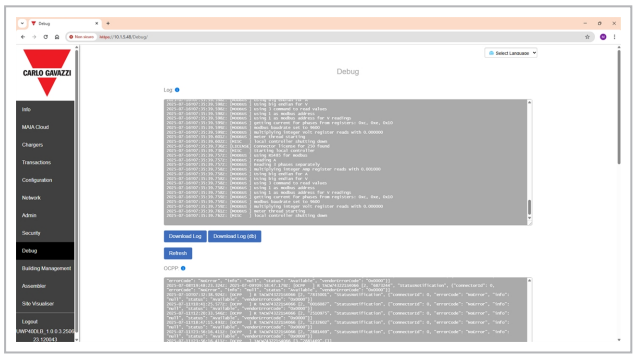
3. Enter the new password.
4. Enter the new password again in the confirm new password field. It has to be an exact match to the password you entered in step 3. If you enter a password that does not match, the software will reject your password change when you select the **Update** button in the next step.
5. Select **Update**.

View and Download the Debug log

If you have a problem with your UWP-DLB, customer support may ask you to provide the debug log or system log files.

You can download the UWP-DLB log from the Debug page or from the **Admin** page.

1. Navigate to the **Debug** page.



   The Debug page shows the UWP-DLB log. It contains recorded data up to the time when the Debug page loaded. It is not a live update and requires **Refresh** to show the latest information.

2. Select **Download Log** to download the UWP-DLB log to your PC in txt format or **Download Log (db)** to downlaod the UWP-DLB log in database (.db) format.

   Below the normal UWP-DLB log is the OCPP log, this is a transaction list of messages from chargers to UWP-DLB, also messages from UWP-DLB to the CSMS:



Assembler

This is a configuration page for branding and external meter configuration uploads.

Custom UI Branding

This should be a zip file containing a **branding.json** file and any images.

Custom branding files should be obtained through Carlo Gavazzi support, below shows a working example of a simple branding file:

```
{
    "Navigation" : {
        "HeadText": "",
        "HeadImg": "logo.png",
        "HeadImgHeight": 150,
        "HeadImgLeftOffset": 4,
        "HeadImgRightOffset": 0,
        "HeadImgBottomOffset": 12,
        "HeadOrderReverse": 0,
        "HeadStyle": "font-size: 100%;"
        "MenuStyle": "color: #241f59;",
        "MenuActiveStyle": "color: white; background: #333333;",
        "MenuFocusHoverStyle": "color: white; background: #aaaaaa;"
    },
    "Content" : {
        "FootText": "© 2024 My Company - All rights reserved",
        "FootStyle": "color: #000000",
        "SectionBack": "#CECECD",
        "CardBack": "#F3F2F2",
        "CardLabel": "#FFFFFF",
        "CardLabelBack": "#EF3340",
        "Button": "#FFFFFF",
        "ButtonBack": "#3E6DBE",
        "ToggleOn": "#FFFFFF",
        "ToggleOnBack": "#3E6DBE",
        "ToggleOff": "#FFFFFF",
        "ToggleOffBack": "#CECECD"
    },
    "Colors": {
        "Primary" : "#FFFFFF",
        "PrimaryBack" : "#404040",
        "Secondary" : "#FFFFFF",
        "SecondaryBack" : "#FFFFFF"
    }
}
```

Where logo.png is an image file with a transparent background.

To clear any branding upload a zip containing a branding.json with only:

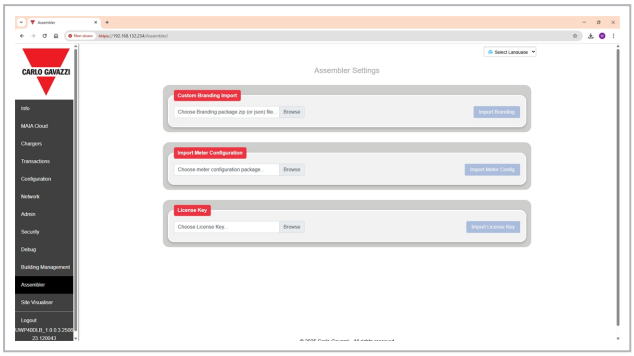
```
{
}
```

External Meter Configuration

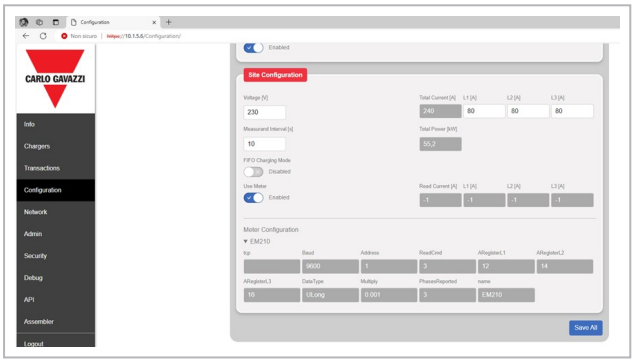
The meter config file is a JSON file with the following content (**Note this is case sensitive**):

```
{
"name": "friendly name",        // put in the name of the meter you want to see
"tcp":true,                     // true when on ethernet/Wi-Fi, false on RS485
"IP":"192.168.1.110",           // only enter this when tcp is true
"Baud":9200                     // for RS485 mode this is the baud rate
"AddressA":1,                   // the address of the meter for current readings
"ReadCmd":3,                    // the command to read, normally 3
"ARegisterL1":1,                // the address of the L1 Current
"ARegisterL2":11,               // the address of the L2 Current
"ARegisterL3":21,               // the address of the L3 Current
"DataTypeA":"Short",            // Ushort (U16), Short (S16)
                                // Ulong (U32), Long (S32)
                                // Float
                                // NOTE Types are CASE SENSITIVE!
"EndianA":"big",                // Ordering of the bytes, big (default) / little
"MultiplyA":0.01,               // The amount to multiply to get whole A
"AddressV":1,                   // meter address for voltage (if different from A)
"VRegisterL1":0,                // the address of the L1 Voltage
"VRegisterL2":10,               // the address of the L2 Voltage
"VRegisterL3":20,               // the address of the L3 Voltage
"DataTypeV":"Short",            // data size for the Voltage register
                                // see DataTypeA for examples
"EndianV":"big"                 // Ordering of the bytes, big (default) / little
"MultiplyV":0.01,               // multiply to get whole V (if different from A)
"PhasesReported":3              // Number of phases reported
}
```

Note: If the voltage read is lower than 90 V or above 260 V the entry is ignored and the default manual Voltage is taken. When applying a new meter configuration if you get a blank value, check the address, the type and also the multiply value as something out of range will not be shown.



The Modbus registers can be checked in the Configuration screen:



Modbus Troubleshooting

Things to check:

- Specified MODBUS baud rate is the same as the meter
- Specified MODBUS address is the same as the meter
- UWP-DLB supports 8N1 (8 bits no parity one error bit)
- The RS485 wiring is incorrect, if in doubt swap the D+/D- (A/B)
- Modbus RTU should be selected (if there is an ASCII/RTU mode)

Site Visualiser

This area allows you to upload an image using the “Choose an Image”, then all chargers and their connectors are shown, you can zoom into the image, or the overall scene. Lock the background when you are happy and then drag the chargers to the install locations.

Notes can be added to help in the future with any maintenance. Connectors can be hidden if all chargers have only one connector for instance. Information shown on the map is live with regard to the charging states.

For instance, the yellow highlighted parts are the chargers/connectors and notes put onto this map:

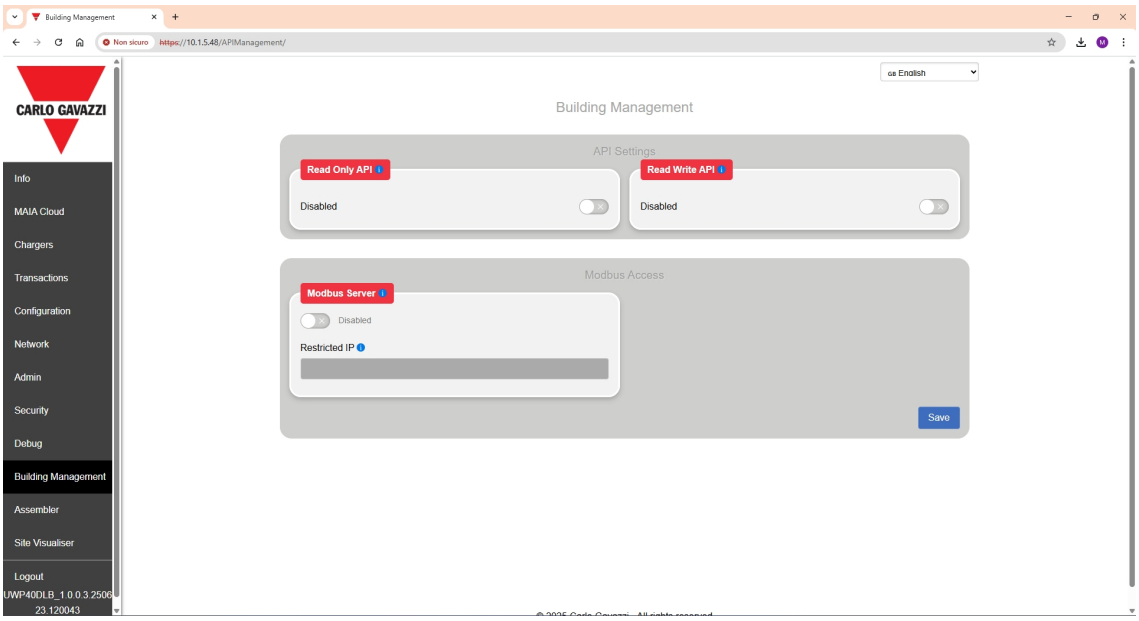


This information can be downloaded as an SVG

Building Management (Modbus Access)

UWP-DLB can be addressed from a building management system using Modbus TCP, this is useful to read status information, charging loads, understand if any chargers are offline and also read the site meter connected to UWP-DLB using an industry standard interface.

The UWP-DLB Modbus unit id is 0xff or 255, it is only available on TCP (port 502) when enabled in the Building Management page, you can restrict access by entering the IP Address of the machine you wish to grant access.



Description	Register	Type	R/W	Notes
Version Super	1000	Ulong	R Only	1 (if the version is 1.2.14)
Version Major	1002	Ulong	R Only	2 (if the version is 1.2.14)
Version Minor	1004	Ulong	R Only	14 (if the version is 1.2.14)
Configured Chargers	1006	Ulong	R Only	Number of known chargers
Connected Chargers	1008	Ulong	R Only	Number of currently connected chargers
Licenses Used	1010	Ulong	R Only	Number of licenses used

Description	Register	Type	R/W	Notes
Licenses Total	1012	Ulong	R Only	Max number of licenses
Error bitfield	1014	Ulong	R Only	Bit field 0 - csms error Bit field 1 - meter failure Bit field 2 - charger offline Bit field 3 - emergency stop Bit field 4 - Modbus offline
Meter L1 - Current Reading	1100	Ulong	R Only	mA current reading, 0xffffffff with no meter or in error
Meter L2 - Current Reading	1102	Ulong	R Only	mA current reading, 0xffffffff with no meter or in error
Meter L3 - Current Reading	1104	Ulong	R Only	mA current reading, 0xffffffff with no meter or in error
Meter L1 - Voltage Reading	1106	Ulong	R Only	V*100 reading, 0xffffffff with no meter or in error
Meter L2 - Votlage Reading	1108	Ulong	R Only	V*100 reading, 0xffffffff with no meter or in error
Meter L3 - Voltage Reading	1110	Ulong	R Only	V*100 reading, 0xffffffff with no meter or in error
Manual Site Voltage	1200	Ulong	R/W	V/100 reading in range 90<V<260, used when no meter
Meter Enabled	1202	Ulong	R/W	0 - disabled, 1 - enabled
FIFO Mode Enable	1204	Ulong	R/W	0 - disabled, 1 - enabled
Split Mode Enable	1206	Ulong	R/W	0 - Off, 1 - Dual, 2 - Three phase
Site - L1 Limit	1208	Ulong	R/W	A max for the site in normal use
Site - L2 Limit	1210	Ulong	R/W	A max for the site in normal use
Site - L3 Limit	1212	Ulong	R/W	A max for the site in normal use
Site (Degraded Mode) - L1 Limit	1214	Ulong	R/W	A when configured meter is faulting
Site (Degraded Mode) - L2 Limit	1216	Ulong	R/W	A when configured meter is faulting
Site (Degraded Mode) - L3 Limit	1218	Ulong	R/W	A when configured meter is faulting

Description	Register	Type	R/W	Notes
Charger Used - L1	1220	Ulong	R Only	mA used by known chargers
Charger Used - L2	1222	Ulong	R Only	mA used by known chargers
Charger Used - L3	1224	Ulong	R Only	mA used by known chargers
Available - L1	1226	Ulong	R Only	mA currently available for new charging sessions
Available - L2	1228	Ulong	R Only	mA currently available for new charging sessions
Available - L3	1230	Ulong	R Only	mA currently available for new charging sessions
Power Limit reached	1232	Ulong	R Only	non 0 if system is limiting power usage
Emergency Stop	2000	Ulong	R/W	Set to 1 to stop all transactions in the case of emergency, this bit needs to be cleared to allow new charging sessions, this can be done from Modbus or the Web UI
Charger 1	3000	Ulong		Name of the device in 8 uint16s on little endian, convert the name by casting the raw data as a 'C' char string
Offer connector 1	3008	Ulong	R Only	Offer in mA to connector 1
Offer connector 2	3010	Ulong	R Only	Offer in mA to connector 2
Offer connector 3	3012	Ulong	R Only	Offer in mA to connector 3
Offer connector 4	3014	Ulong	R Only	Offer in mA to connector 4
Current used	3016	Ulong	R Only	Current used by connector 1 L1 in mA
Current used	3018	Ulong	R Only	Current used by connector 1 L2 in mA
				Continues L3 connector 2 L1 .. connector 4 L3
Charger stat 1/2	3040	Uint16		Charger state for connector 1 and 2 (1 in low byte)
Charger stat 3/4	3041	Uint16		Charger state for connector 3 and 4 (3 in low byte)
Charger 2..100	3064	See 3000-3041		2-100th Charger, each charger is at 64 register increments,

Building Management API (API Settings)

The UWP-DLB also has a HTTPS API (Application Programming Interface) that can be used to interface other systems to UWP-DLB, this is similar to the Modbus access but can access almost all features and settings. Depending on your requirements, this can be set to only read configuration and status or allow updating as well.

The API uses HTTPS web requests and a JSON file format to communicate, contact support directly for more information on this file format.

To enable the API, you will need to:

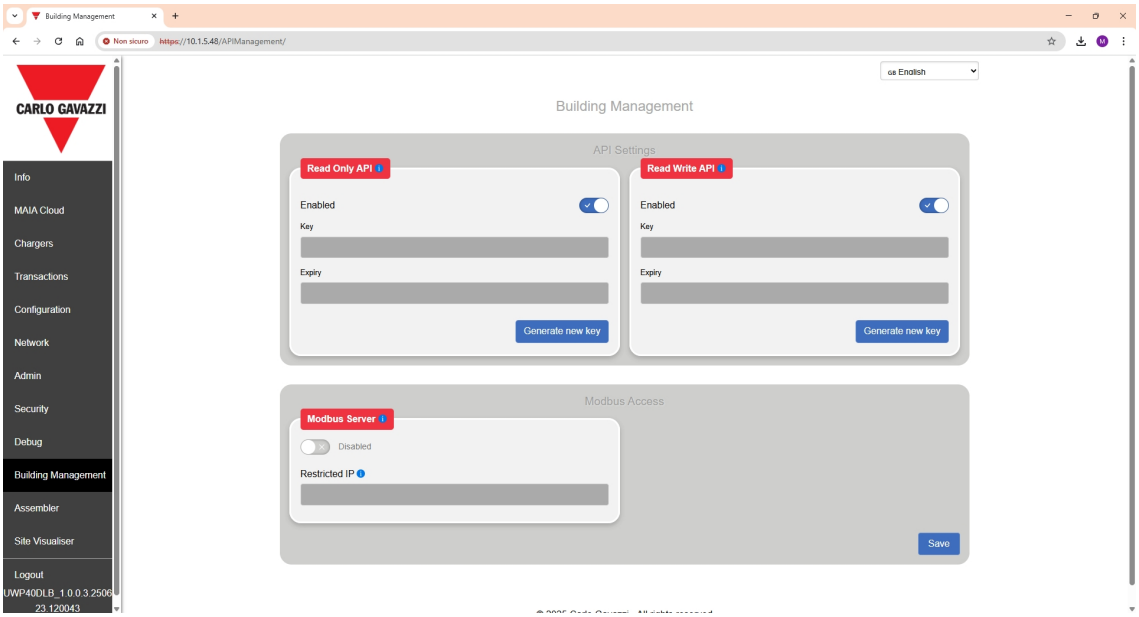
- Set up the API keys that allow the connection to the UWP-DLB, read only or read writable.
- Make your web fetch from UWP-DLB using the secure token to gain access.

Enable or Disable the API key function

To use the API to access the UWP-DLB's data:

1. Navigate to the **Building Management**page.

The "API Settings" has two sections: the **Read Only API** and the **Read Write API**. They both have their own settings.



2. Enable or disable each key as appropriate.

There is a switch for a read-only key and a read-write key. Depending on what you want to use the API for, you will need to enable one or both keys.

To find out what key you will need, see "Endpoints" on the facing page. There, we explain what endpoints and parameters are available, what they do, and which key they require.

3. Select **Generate new key**.
4. Enter the time period that the key will remain valid. When this time is reached, the API will become unavailable using this key and you will need to generate a new one.
5. Select **Generate**.

The Carlo Gavazzi software adds the key information to the **Key** and **Expiry** fields automatically.

Endpoints

The API has these endpoints:

- "Read load balancing" below
- Write load balancing.

These should be issued to the board a HTTPS post; the key should be included in a multipart/formdata.

Read load balancing

Use to read the load balancing data that is present on the Info page of the UWP-DLB web interface. You can use **either of the API keys to read the data** (see).

URL:	/Endpoints/ReadLoadBalancing/ Example: https://<UWP-DLBIP>/Endpoints/ReadLoadBalancing/	
Request format:	Key:	API key
Response format:	Data:	JSON data that is displayed in the fields on the Info page.
	apiStatus:	A number indicating the status. 1 = Request is successful 2 = API key is disabled 3 = Invalid API key submitted
	errorMessage:	Text representation of the apiStatus when the apiStatus is 2 or 3.

Write load balancing

Use to write the load-balancing data. You must use a **Read Write API** key to write the data (see Enable or Disable the API key function).

URL:	/Endpoints/WriteLoadBalancing/ Example: https://UWP-DLB/Endpoints/WriteLoadBalancing/	
Request format:	Key:	API key data
	Data:	Load balancing JSON data to write
Response format:	Data:	JSON data that is displayed in the fields on the Info page.

	apiStatus:	A number indicating the status. 1 = Request is successful 2 = API key is disabled 3 = Invalid API key submitted 4 = No data sent to write
	errorMessage:	Text representation of the apiStatus when the apiStatus is 2, 3, or 4.

Example write request

{"server":"10.0.27.81","port":"8887","path":"\/UWP-DLBtest","secure":false,"voltage":"230","totamps":"20","usemeter":false,"MeasurandInterval":10,"allownewcharging":true,"chargecurrent":0,"availablepercharger":20,"meterreading":-1,"connectionstats":[],"savedchargers":{"Garage":{"fullpower":false,"connectors":[1],"kWh":true}},"URL":"ws:\/\/10.0.27.81:8887","identityprepend":"UWP-DLBtest","UWP-DLBVersion":"1.0.0"}

Example response

{"data":{"server":"10.0.27.81","port":"8887","path":"\/UWP-DLBtest","secure":false,"voltage":"230","totamps":"20","usemeter":false,"MeasurandInterval":10,"allownewcharging":true,"chargecurrent":0,"availablepercharger":20,"meterreading":-1,"connectionstats":[],"savedchargers":{"Garage":{"fullpower":false,"connectors":[1],"kWh":true}},"URL":"ws:\/\/10.0.27.81:8887","identityprepend":"UWP-DLBtest","UWP-DLBVersion":"1.0.0"},"apiStatus":1}

Parameters

You can use the following parameters with the endpoints. Include them in your request inside double quotes (for examples of the correct syntax, see Write).

Parameter	Description	Values	Access
server	CSMS server address IP/host	**String**	**Read write**
port	CSMS server address port	**String**	**Read only**
path	Identity of UWP-DLB	**String**	**Read write**
secure	Use WS or WSS	**Boolean**	**Read only**
voltage	Site voltage	**Float**	**Read write**
totalamps	Site total Amps (alternative to W)	**Float**	**Read write**
totalampsL1	Site total Amps for L1	**Float**	**Read write?**
totalampsL2	Site total Amps for L2	**Float**	**Read write?**
totalampsL3	Site total Amps for L3	**Float**	**Read write?**
Totalkw	Used kW	**Integer**	**Read write**
usemeter	Use a power meter to balance power with other power users	**Boolean**	**Read write**
meterreading	Total of all phases reported by Meter	**Float**	**Read**
MeasurandInterval	Measure and interval (seconds). How often the values are read from the EV charger.	**Integer**	**Read write**

Parameter	Description	Values	Access
allownewcharging	Defines what happens when the CSMS cannot be reached. When True, new charging is allowed without validation. When False, existing charging can continue but new charging sessions cannot be started.	**Boolean**	**Read write**
WhiteListActive	Reserved		
SnoopForWhitelist	Reserved		
chargecurrent	Current used for charging (A)	**Float**	**Read only**
availablepercharger	Current per charger (used for the charging profiles)	**Float**	**Read only**
Meterreading	Reading from the power meter (if a meter is used)	**Integer**	**Read only**
connectionstats	Information about currently connected chargers. The connectionstats parameter has additional parameters that are included in square brackets. We explain these in and Connectionstats per charger	**json**	**Read only**
savedchargers	Information about the chargers that have been detected. The savedchargers parameter has additional parameters that are included in curly brackets. We explain these in Saved chargers	**json**	**Mixed**
URL	URL of CSMS, for example, wss://csms.com:9101. Note: "/" must be escaped i.e “wss:\/\/:80”	**String**	**Read write**
Identityprepend	Identity of UWP-DLB	**String**	**Read only**
UWP-DLBVersion	UWP-DLB version number, i.e. 1.0.6	**String**	**Read only**
Whitelist	Reserved		
ModbusConfig	See Description of the meters’ Modbus parameters see Modbus configuration	**String**	
UpdateStartHour	Time For Auto updates from server to start	**Text**	**Read/Write**
UpdateStartMinutes	Time For Auto updates from server to start	**Text**	**Read/Write**
UpdateEndHour	Time For Auto updates from server to finish	**Text**	**Read/Write**
UpdateEndMinutes	Time For Auto updates from server to finish	**Text**	**Read/Write**
UpdateURL	Auto update server	**Text**	**Read/Write**
UpdateURLName	Auto update server login	**Text**	**Read/Write**

Parameter	Description	Values	Access
UpdateURLPassword	Auto update server login	**Text**	**Read/Write**
FIFOMode	Turn on FIFO mode	**Boolean**	**Read/Write**
RFIDActive	Turn on a local RFID reader	**Boolean**	**Read/Write**
Schedule	JSON List of times for scheduled exclusions to charging	**JSON**	**Read/Write**
ScheduleTimeZone	Timezone of the UWP-DLB	**Text**	**Read/Write**

Connectionstats per connector

For each connector, the connectionstats has additional parameters that are included inside square brackets, for example:

```
"connectionstats":[],
```

hadmeasurands	Meter values has been received	Boolean	Read only
chargestarted	Charging session has been approved	Boolean	Read only

Connectionstats per charger

For each connector, the connectionstats has additional parameters that are included inside square brackets, for example:

```
"connectionstats":[],
```

serverconnected	There is a connection to the CSMS for this charger	Boolean	Read only
actions	Json array of the per connector information	json	Read only

Saved chargers

The connectionstats has additional savedcharger parameters that are included inside curly brackets, for example:

```
"savedchargers":{"Garage":{"fullpower":false, "connectors":[1], "kWh":true}},
```

fullpower	The charger is not load balanced	Boolean	Read write
connectors	Recognised charger connectors	Json array with connectorIds	Read only
kWh	The charger will be sent profiles in kW per hour	Boolean	Read only
maxpower	Power in A	integer	Read write

<table>
<tr><td>maxpowerUnit</td><td>Amp (A) or Watt (W)</td><td>String (“A” or “W”)</td><td>Read write</td></tr>
<tr><td>phases</td><td>List of
<table>
<tr><th>Phases</th><th>Value</th></tr>
<tr><td>Single phase</td><td>1</td></tr>
<tr><td>Three phase</td><td>2</td></tr>
<tr><th>Wired</th><th>Value</th></tr>
<tr><td>Single phase</td><td>L1</td></tr>
<tr><td>Single phase</td><td>L2</td></tr>
<tr><td>Single phase</td><td>L3</td></tr>
<tr><td>Three Phase</td><td>L1-L2-L3</td></tr>
<tr><th>Bits</th><th>Value</th></tr>
<tr><td>Reserved</td><td>Do not write</td></tr>
</table></td><td>List of strings</td><td>Read write</td></tr>
</table>

Modbusconfig

This is a description of the JSON

tcp	True/false, when false RS485 is assumed	boolean
IP	IP address of meter, only needed if tcp was true	string
port	TCP port of the meter. 502 if the field is missing. Only for tcp	int
Baud	Baud rate on RS485, not needed with tcp	int
Address	(0-255) Modbus station address	int
kWh	true/false Meter values are in kWh	boolean
PhasesReported	1/3 number of phases reported from the meter	int
Multiply	Number integer reading will be multiplied with, default to 0.01	float
ReadCmd	(0-255) Value used to send a read command (function byte)	int
DataType	(Short|Long|ULong|Float) data type of the values to read	string
KwhRegister	Register that holds total kWh	int
ARegister	**Register that holds total A**	**int**
ARegisterL1	**Register for L1 reading in A**	**int**
ARegisterL2	Register for L2 reading in A	int
ARegisterL3	Register for L3 reading in A	Int
VRegisterL1	Register for L1 reading in V	int
VRegisterL2	Register for L2 reading in V	int
VRegisterL3	Register for L3 reading in V	Int

Tested Chargers

Tested Chargers

This is a list of some known chargers tested with UWP-DLB:

Charger	Notes	Image
EO Genuis 2 EO Mini Pro 3	From Version 1.00	
Autel MaxiChargerAC	From Version 1.3.11 Tested with MaxiCharger firmware Charge Control Module V1.51, previous to that load balancing profiles were not accepted.	
Autel 47KW DC	From Version 1.3.8	
ABB Terra AC W22 T RD MC 0 Firmware 1.6.6	From 1.1.7 onwards (tested with 1.6.9 and 1.8.0)	
Ratio io7	From Version 1.0.14	
Blink 30/40Kw DC charger	Testing in progress	

Charger	Notes	Image
Hellonext DC 30Kw	From version 1.0.11	
Schneider EVlink Smart Wallbox	Tested with firmware 3.3.0.17	
EVBox Elvi AC	Unknown charger firmware.	
MSI EV Premium / EV AI / EV Life	Preproduction units tested. Tested with 1.1.6	
Trilog simulator	EV stack tested with 1.1.7	
Kevit DC Charger Dispenser 240KW	Remote testing and load balancing.	
ChargeSim	DC 3 Phase charger simulation. UWP-DLB tested with 50 DC units connected and charging simultaneously.	ChargeSim
Heliox DC chargers	Support from 1.2.0	
Dover Charging	Support from 1.1.7	
Blink IQ200	Limitation a minimum of 6 A. Supported from 1.3.4 Note for plug and charger the configuration of MaxEnergyOnInvalidID should be set to the full power otherwise output maybe limited	

Charger	Notes	Image
Alpitronic / Hypercharger HYC400	Note on the charger configuration untick the start transaction with zero port and set the minimum to 15KW, this may be reduced but is known to function. Note that enabling ChargePointMaxProfile is needed to allow load balancing on the charger end. Note: “ in the charger OCPP settings” ChargePointMaxProfileEnabled must be set to TRUE.	
Alfen Eve Single	From firmware 1.2.12 Tested with OCPP1.6	
Orbis VIARIS UNI	Tested with firmware 7.3.34	
TeltoCharge		
ZJBenny	Dual AC charger Firmware 1.0.28	
Garo GLB+ Outlet LAN		
BYD	160KW DC Note use WS connection to UWP-DLB, WSS connection in tests dropped out re-requesting the OCPP configuration.	

Charger	Notes	Image
Delta DC 25kW EV Charger Wallbox	Support for higher offers when utilization is still <90% of the offer. (1.3.30)	
ABB T124	Start New Transactions with Zero Power may need to be disabled and the minimum set to 6 KW to start transactions.	
Alpitronic HYC50	Note on the charger configuration page, untick the start transaction with zero power, set the minimum to 10 kW (this may be reduced but is known to function) and set “kW” as charge rate unit. The charger must be rebooted afterwards. Note: “ in the charger OCPP settings” ChargePointMaxProfileEnabled must be set to TRUE.	
Vestel EVC04		
Kempower Station Charger		
Wallbe NEO	Firmware version: BE-03.02.13	
Wallbox Supernova		
Vega Aloha Gravity	Version FW 2_1.3.0	
Vega Aloha Lander	Version FW 2_1.3.0	
Vega Aloha Lander Plus	Version FW 2_1.3.0	

CSMS Tested

CSMS Provider:

- Saascharge
- WeVolt
- ChargeHub
- Monta
- Volttime
- Fuuse
- ChargeFox

Charger OCPP Messages

Measurand Settings

UWP-DLB uses measurand information to monitor power usage of the charger. Many fields as reported by the charger are optional, to find the correct supported MeterValuesSampledData key for AC chargers we first send

"Current.Import.L1,Current.Import.L2,Current.Import.L3"

If rejected UWP-DLB sends

"Current.Import"

If rejected again UWP-DLB sends

"Power.Active.Import.L1,Power.Active.Import.L2,Power.Active.Import.L3"

Finally if rejected UWP-DLB sends

"Power.Active.Import"

After that UWP-DLB tries features separately, adding the ones that were accepted:

"Energy.Active.Import.Register"

"SoC"

"Voltage"

For DC chargers UWP-DLB skips the first two (three if it's an ABB) and add

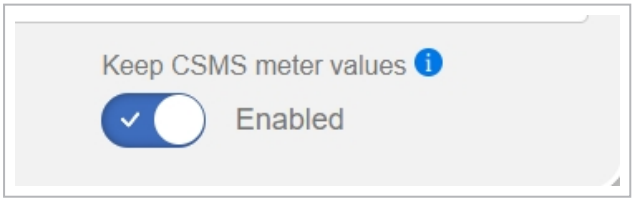
"Power.Offered"

To the list of features to test.

At the end UWP-DLB combines the accepted values for the final setting to the charger.

The system will still work if the charger rejects everything above, so long as it still sends measurands to UWP-DLB.

Further to this in the configuration if Keep CSMS meter values is enabled UWP-DLB will also pass through any additional settings the CSMS is asking on top of the ones UWP-DLB needs.



Charger Profiles

Profiles detail charging limits for chargers.

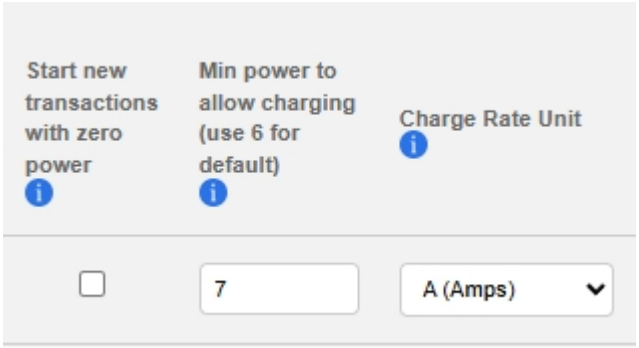
UWP-DLB uses two types of profiles

TxDefaultProfile (active on the whole charger outside of charger sessions)

TxProfile (active on a per charge session basis after the charge starts)

Some chargers support only TXProfile, in which case they can be load balanced after a charging session has been started, but that may mean using some power for a few seconds before being told to limit.

Ideally a charger will support TxDefaultProfile as it allows UWP-DLB to limit the power before a session has started.



Some chargers will go “out of service” if UWP-DLB sets its normal default of 0.1A TxDefaultProfile, in which case - increase the minimum charging value (normally to 6A / 6KW) and untick the “start transactions with zero power box”. 6KW maybe too low for some DC chargers so this maybe a trial-and-error value, although the lower the better you can start with a much higher value for testing.

Log Out

To help prevent unauthorized use of the UWP-DLB, log out when you have finished working with the software.

1. Select **Logout**.
2. At the prompt, select the **Logout** button to complete the logging out process.

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