CIRCONTROL
Mobility & eMobility

Dynamic Load Management

Instruction Manual

Dynamic Load Management Instruction Manual

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Here's your guide to use DLM

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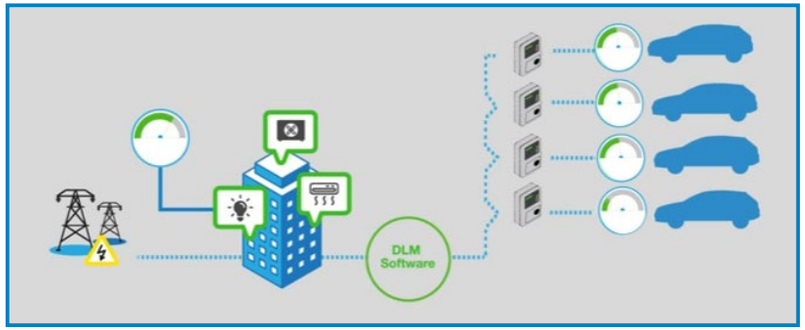
1 So, hello!

Dynamic Load Management (DLM) system is designed for an intelligent energy management of several charging stations operating simultaneously.

Charge more EVs simultaneously in less time using the available power more efficiently and balancing it among the EV chargers.

Increase the number of charging points without increasing the available power of the supply.



- Prevents blackouts by avoiding exceeding the contracted power.
- Energy meter is an optional kit to monitor in real time the available power and adjust in real time the consumption of electric vehicles.
- Automatic detection of fully charged vehicle to optimize the available power to other vehicles that need it.
- Detection of single-phase, two-phase or three-phase vehicle to adjust to each need and optimize all power consumptions of electric vehicles.
- Special functionalities dedicated to vehicle fleets:
    - Charge prioritization by plug. Each priority plug allows charging using maximum available from supply.
    - Possibility to set time-slots for priority and non-priority plugs

Designed for

2 System Description

Load Management System monitors the power consumption of the building in real-time and all contracted power that is not being used is provided to the electric vehicles (EV).

All the dedicated current for EV is equally distributed on each plug in order to not exceed the contracted power.

It is recommended to have at least 6A (Mode 3 minimum allowed current) per socket in the worst case when the consumption of the building is too high.

Load Management System can pause charging transactions when the current for each socket is less than 6A and resume it when the current goes back to 6A or more for each socket.

> The less power available for Electric Vehicles, The longer it takes in charging Electric Vehicles to 100% of battery.

Plug Work Mode

There are two groups of plug work mode:

- Priority plugs
- Standard plugs (no priority)

Priority plugs charge preferably before than standard ones. System gives the maximum current to priority plugs allowing charging faster than standard plugs. The remaining current not used by priority vehicles is provided to the standard plugs. (If available and according between contracted power and building consumption).

EXAMPLE

Available current for EV: 40A

1 Priority Plug charging at 32A

Remaining current for standard plugs: 40 - 32 = 8A

- Priority plugs only become in operation within an established time slot.
- Priority plugs are an optional feature. By default is disabled and can be enabled any time.

Standard plugs start charging transaction in the following cases:

- Remaining current not being used by priority vehicles. Explained in above example.
- No priority plugs are charging.
- Present time slot is not set as priority and all plugs are considered as standard ones.

> Check **Appendix 2** for General Behaviour of load management policy for both plug mode.

3 Requisites

A DLM Hardware

DLM solution is a software running inside a hardware which is available as a three different product names:

Product name	Format	Charge points supported
DLM Conec	Embedded	5
DLM Box	Desktop PC	15
DLM Server	Rack Server	30 45 60

Each charge point could have 1 or 2 sockets.
i.e. Conec DLM can manage up to 10 sockets/vehicles.

1. DLM Conec

Embedded Fanless system with low consumption hardware, specially dedicated to small applications; fleets or car parks with a few number of electric vehicle bays.

Dimensions	140D x 190W x 36H
Power Supply	Input: VAC 100~240V adapter Output: 12DC

2. DLM Box

Desktop PC format (screen not included) specially dedicated for middle applicattions; communal blocks and working places where the number of electric vehicle bays are quite important.

It is able to manage up to 15 charge points (30 sockets).

3. DLM Server

Server in rack format whose features allow greater performance, speed and ability to handle up to 60 charge points (120 sockets).

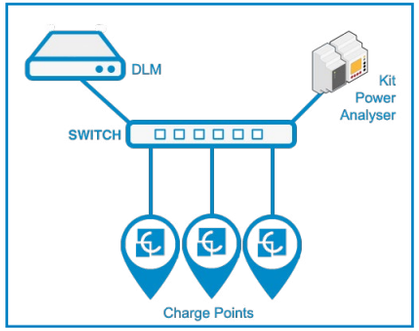
This solution is oriented to locations where there is a frequent use of charge points and a constant monitoring of the available power from main supply.

It is important to choose the type of hardware according to the needs of the location as it allows more flexibility to add more charge points when required.

B Wired communication

DLM solution is based to be placed on local sites where it is required use ethernet cables between following devices:

- DLM Conec/Box/Server
- Charge points
- Kit Power Analyser



Each device requires one static private IP address on network.
Please check with your IT specialist about range of IP addresses available in the network.

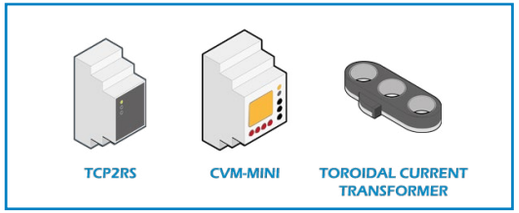
Take note about all MAC addresses during commissioning.
These information will be required later when configuring DLM system.

C Kit power analyser

Optional kit that allows the DLM to avoid the excessive power consumption in real-time.

Ideal solution when main supply is not fully dedicated for charge points.

Kit consists of the following devices:



- **TCP2RS+**: RS-485 to Ethernet converter.
- **CVM-MINI:** Three-phase power analyser
- **Current transformer (CT) :** Current transformer, needed to measure the consumption.

Only CVM-MINI power analyser is compatible with DLM solution.

List of Current transformer models

Following table list shows different models of kit power analyser for each wiring need:

Product name	Solid core - Max current	Split core
Kit power analyser 63	63A	✗
Kit power analyser 125	125A	✗
Kit power analyser 125+	125A	✓
Kit power analyser 250	250A	✗
kit power analyser 800	800A	✓

Solid core CTs (toroidal) are more compact and accurate. Measured circuit must be disconnected to install solid core CT, so they are better suited for new wiring or permanent installation.

Split core CTs (opening) have a removable section, so that they can be instaled without interrumping the circuit.

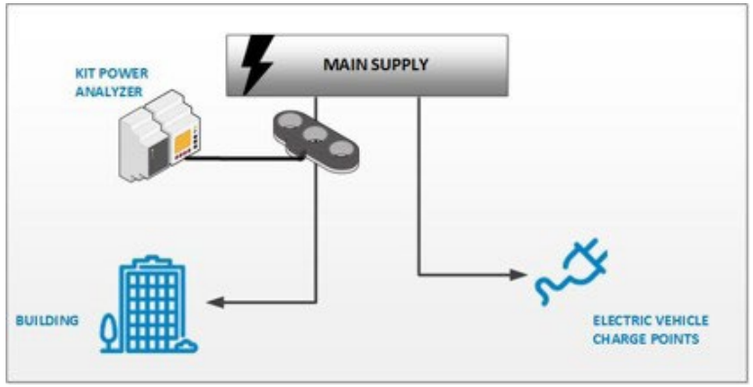
Solid core CT Split core CT

Current Transformer Location

Two different options are suitable for CT location depending on the architecture between Main distribution board, Building and EV electrical circuits lines:

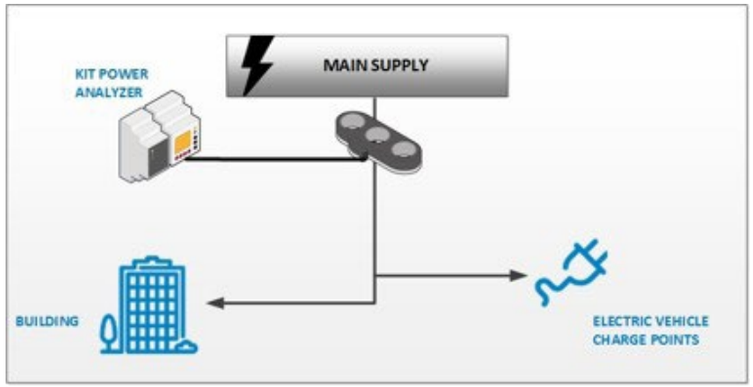
Option A:

Building power supply line and Electric Vehicle power supply line, are separated from the main distribution board

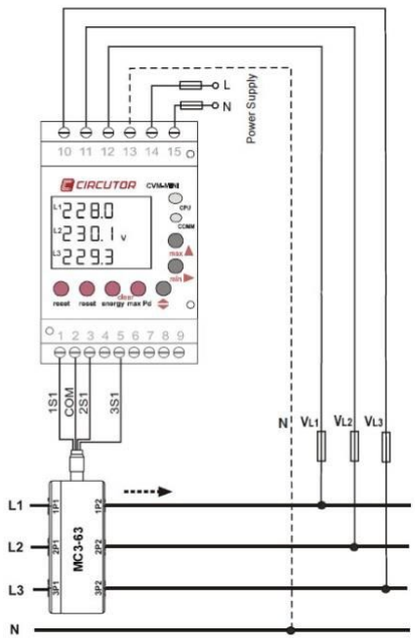


Option B:

Building and Electric Vehicle charge points shares same power supply line from Main distribution board.



CVM-MINI Connection



CVM-MINI	CT Connection
PIN 01	1S1
PIN 02	COM
PIN 03	2S1
PIN 04	Nothing
PIN 05	3S1
PIN 06-09	Nothing

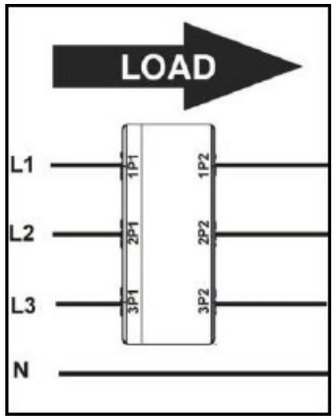
CVM-MINI	Voltage Connection
PIN 10	L1
PIN 11	L2
PIN 12	L3
PIN 13	N

CVM-MINI	Supply	
PIN 14	L	230 Vac
PIN 15	N	

Only trained and qualified personnel should manipulate the wiring.

Current Transformer Load direction

Before installing the current transformer (CT), pay attention to the load direction from power supply and the correct order of the phases in order to ensure the correct reading on the power consumption.



1P1 = L1 Input power	**1P2 = L1 Output power**
2P1 = L2 Input power	**2P2 = L2 Output power**
3P1 = L3 Input power	**3P2 = L3 Output power**

Only trained and qualified personnel should manipulate the wiring.

TCP2RS+

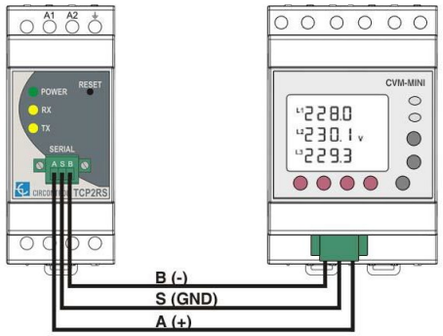
TCP2RS+ is a gateway between RS-485 devices and Load Management System.

Before installing the device, please take note about de MAC address labelled in one side of the device. An IP address must be asigned once the device is connecetd into the network.

Supply	
A1 : L	230 Vac
A2: N	
Ground	
RS-485	
A	Terminal (+)
S	Ground
B	Terminal (-)

RS-485 Connection

TCP2RS+ and CVM-MINI must be connected between each other, using a 2 wire twisted shielded communication cable (STP CAT.5e recommended).



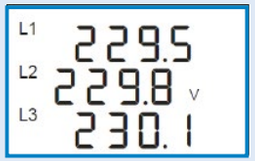
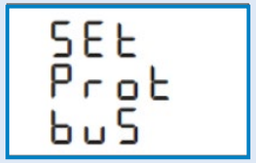
Respect the polarity of the wiring connections otherwise load management system cannot communicate with CVM-MINI

RS-485 Settings

Load Management System expects to find the CVM-MINI under following RS-485 connection details:

- **Peripheral number**: 1
- **Baud rate**: 19200

Use the display and buttons of the device in order to establish the above configuration:

STEP	ACTION
1	Make sure to having powered the CVM-MINI in order to apply the new sttings to the device. Voltage measurement from each phase is the default information displayed by the screen. Following picture shows an example: 
2	To setup communications, first press *Reset* key for a second and immediately press *Setup* key for a long time until following message is displayed on screen: 

STEP	ACTION
3	Press button two times until following message is displayed on screen: SEt nPEr 001 This option allows to modifying the peripheral number of the energy meter.
4	To change the peripheral number, repeatedly press the key to increasing the value of the digit which is flashing at the time. When the required value is on the screen, move on the following digit by pressing to change the remaining values. Press key to confirm the value entered.
5	Next option on the setup menu is baud rate. Press until 19200 Bps value is displayed as shown: SEt bAud 19200 Press key to confirm the value entered.
6	Press 4 times key to return to main screen: L1 229.5 L2 229.8 V L3 230.1
7	Process completed. No additional configuration is required to operate with CVM-MINI energy meters.

D Charge points

Load management system is compatible with following models:

- Dual outlet AC charge point model
- Single outlet AC charge point model

Charge points models above can be either single-phase or three-phase models.

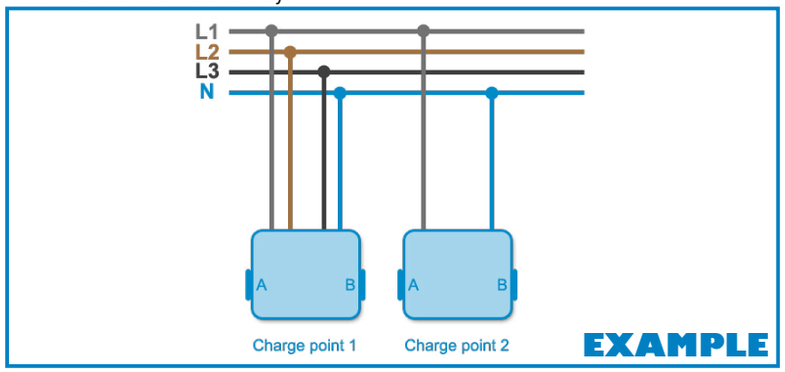
Model Series	Compability
Smart Post	✔
Urban Post	✔
WB Smart	✔
eVolve 1st series	✔
eVolve 2nd series	✔
eNext Park	✔
Master&Slave	✘
Raption 22	✘
Raption 50	✘

Considerations

- Dual and single AC charge points models must have Mode 3 charge mode (Type 1, Type 2 or Type 3 connectors)
- Mode 1 and Mode 2 charging modes are not compatible (CEE 7/4 sockets) otherwise DLM rejects the charge point.

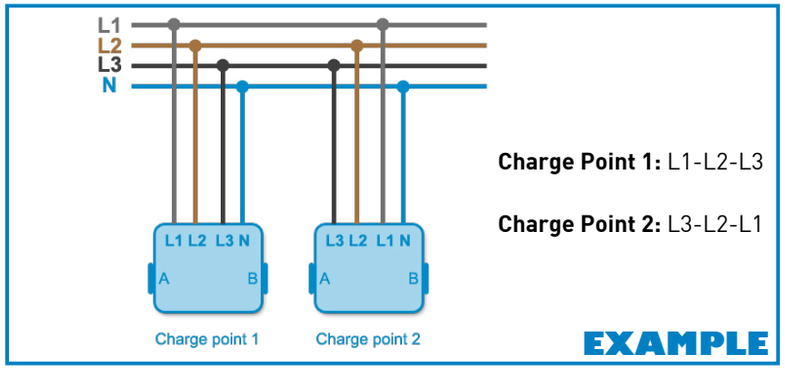
E Electric connections

1. **Charge point supply type.** Single-phase and Three-phase charge points models are compatible with DLM solution and it is also possible to mix them in same car park in order to manage the available current in a more efficient way.



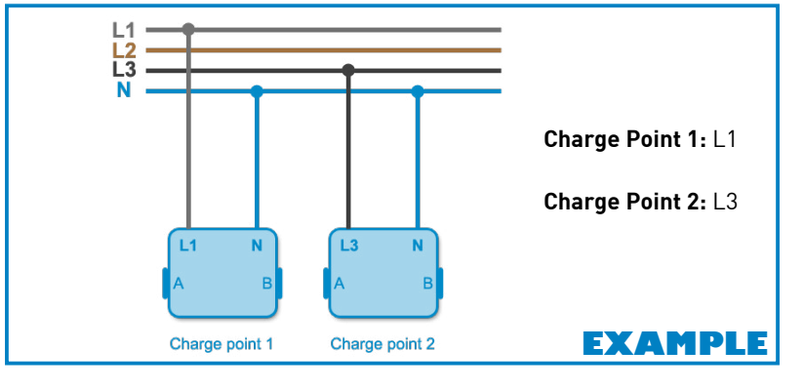
2. **Connector phase rotation.** Defines the wiring order of phases between power supply (grid) and each charge point connector.

   - **Three-phase models**: charge point can be comissioned using different phase order as shown below:



Phase order must be changed physically from power input of charge point and adjust it on DLM system.

   - **Single-phase models**: each charge point can be commissioned using different phases.



Phase order must be changed physically from power input of charge point and adjust it on DLM system.

Take note about connection type (single-phase/three-phase) and phase order for each charge point during commissioning.

This information will be required later to configure DLM system.

Chargepoint name	Connection	Phase order
CP01	single-phase	L1
CP02	three-phase	L3-L2-L1

Distribution Boards

Load Management is ready to work only under 1 distribution board (three-phase connection) and a maximum of 60 charge points (120 sockets).

4 Load Management Tool

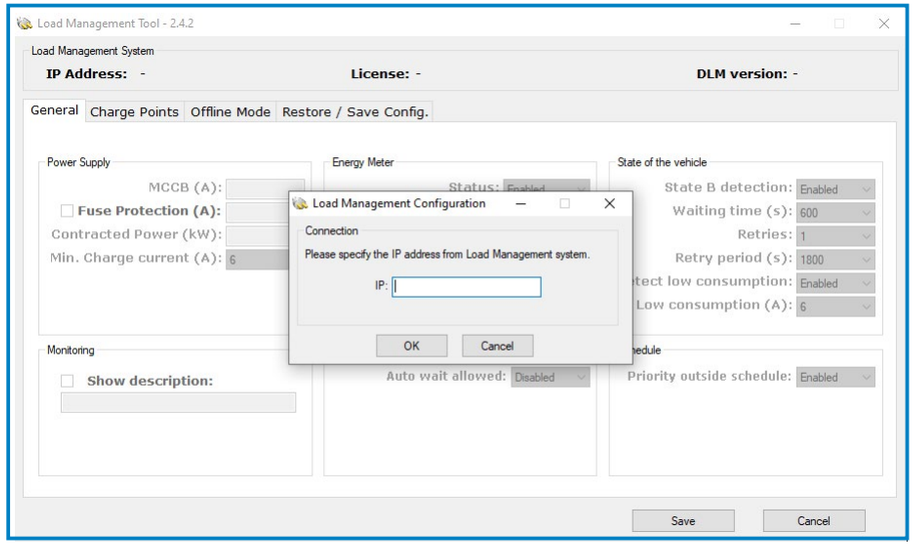
A Basics

All charge points are deactivated first time Load Management System is started and manual setting must be done in order to enable each one.

Load Management Tool software should be used to define electric phase connection of the socket, otherwise the system cannot operate with the charge point.

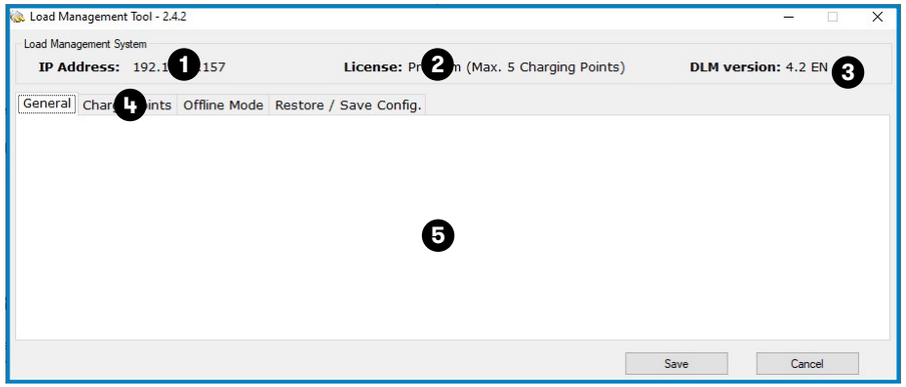
B Settings

By executing the application this window will appear:



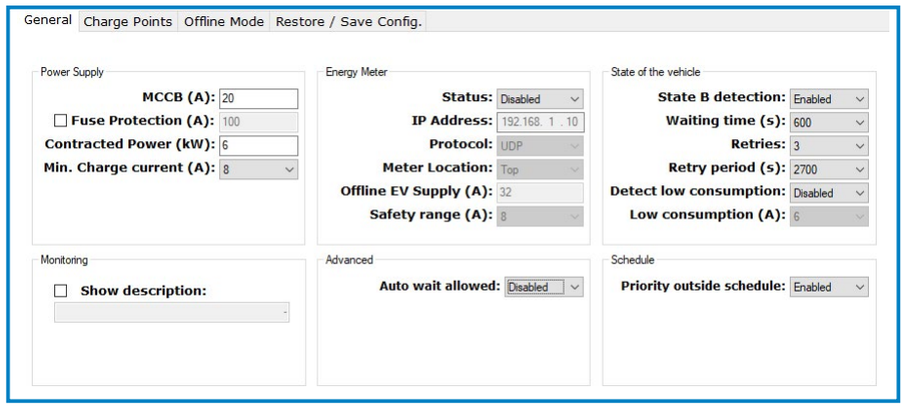
The IP address of the Load Management System needs to be introduced, in order to retrieve its data and check the configuration.

Overview



1 - DLM IP address	4 - Configuration Options
2 - License (max. charge points)	5 - Active working area
3 - DLM firmware version	

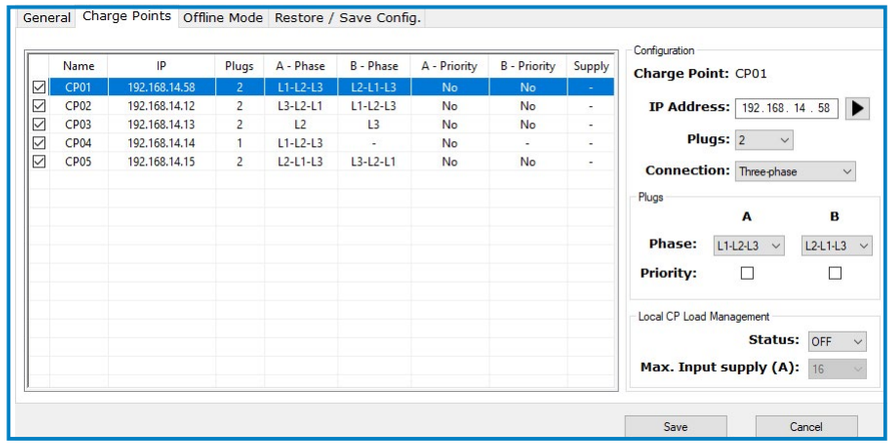
General Settings



Power Supply	**MCCB (A)**	Maximum MCCB current.
	Fuse Protection (A)	Current destinated to EV in case of electrical derivation.
	Contracted Power (KW)	Contracted Power - Only for graphics
	Min. Charge current (A)	Minimum charge current per socket
Energy Meter	**Status**	Enable/Disable energy meter
	IP Address	IP address asigned to TCP2RS+. Check Anex xx for further details.
	Protocol	Select data communication protocol. Default UDP.
	Meter Location	Top (option B) or building (option A)
	Offline EV supply (A)	Default current in case of DLM do not communicate with Kit Power Analizer.
	Safety range (A)	Adds an over and under tolerance to prevent current peak from Main supply .
State of the vehicle	**State B detection**	Enable/Disable State B of vehicle. (vehicle connected but not charging)
	Waiting time (s)	Maximum time in State B before pausing charging and release the "reserved" power to another chargers.
	Retries	Number of retries between waiting time and Retry period. Once retries have been overcome, an Stop transacttion will be sent.
	Retry period (s)	Time to retry activate charging the charger pause because of "waiting time"
	Detect low consumption	Allow detect when charging is close to 100% and EV consums little power.
	Low consumption (A)	Allow to charge below "Min. charge current" parameter.
Monitoring	**Show description**	Allows to put a DLM location which will be shown in SCADA Client.
Advanced	**Auto wait allowed**	• Disable (default): at the moment EV is connected and Authorized, charge transaction will start. • Enable: When EV connected "awaiting approval" is showing in charger display until DLM allows charging.
Schedule	**Priority outside schedule**	• Enable: If there is no calendar defined for Priority, DLM makes power sharing with all the CP. • Disable: If there is no calendar defined for Priority, these ones will not start charging.

It is highly recommended to apply a 15% margin when choosing the caliber of the MCCB, in order to prevent it from working at the limit.

Charge Points

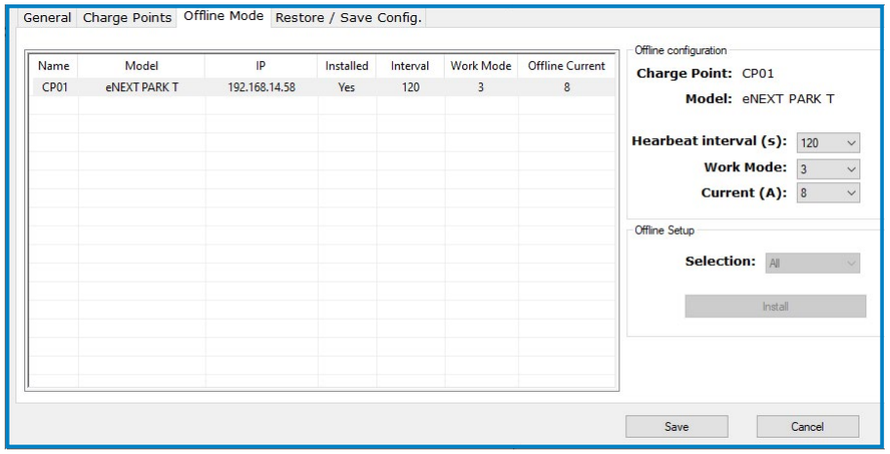


Configuration	**Charge Point**	Name of Charge Point selected
	IP Address	Introduce the Charge Point IP addrees By clicking it, the configuration is set in the table.
	Plugs	Number of plugs (1 or 2)
	Connection	Select between Single-Phase or Three-phase
Plugs	**Phase**	Phase connection order for each plug
	Priority	Priority of each plug (Priority or Standard)
Local CP Load Management	**Status**	Enable in case that total current supply destined to the CP is less than the sum of its sockets.
	Max. Input supply (A)	Maximum current dedicated to the entire CP

Changes don't apply in Load Management System until "Save" button is clicked

Offline Mode

Network connection can be lost due to an unexpected issue such as the PC is powered OFF or even the server is shutdown. In those cases, Charge Points cannot see the Master and they are the ones who make the decisions in order to keep suuplying the Electrical vehicles.



Offline configuration	**Charge Point**	Name of Charge Point selected
	Model	Model of Charger Point selected
	Heartbeat interval (s)	Time interval to check online status
	Work mode	Selection of offline work mode *(check next section)*
	Current (A)	Offline current per socket
Offline Setup	**Selection**	Choose between select a certain CP or all of them
	Install	Press Install to send Offline Setup to the Chargers selected before.

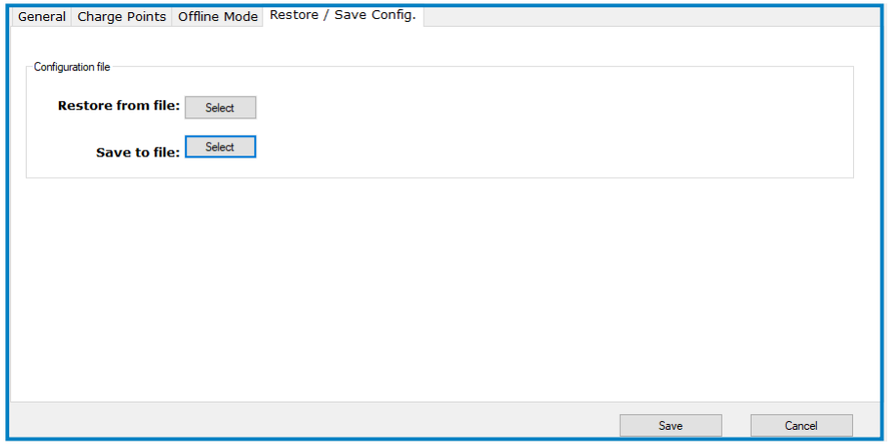
Is is mandatory to Install Offline Setup in every Charge Point in order to add them into Dynamic Load Management system

Offline Work Modes

MODE	ACTIVE CHARGING TRANSACTIONS	NEW CHARGING TRANSACTION	COMMENTS
0	Paused	Paused	-
1	Still active, without modifying the current	Paused	-
2	Still active, the maximum current is set to 8A* per socket	Paused	* The maximum current can be modified
3	Still active, the maximum current is set to 8A* per socket	Start charging at 8A* per socket	

Restore / Save Configuration

Depending on the amount of Charge Points, a large number of settings have been made or are to be made. To facilitate this job during commissioning or maintenance, it is possible to Restore or Save a Load Management Configuration.

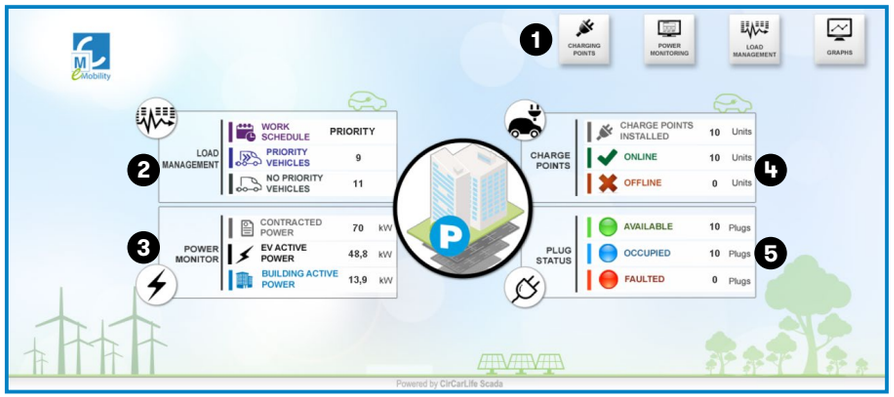


5 Screens

The software has a client application that will allow users to access SCADA screens, reports, set parameters and to display instantaneous values being measured by devices either locally or through a remote connection.

A Main Screen

General information about Charge Points status and Load management.



1 - Shortcut to screens

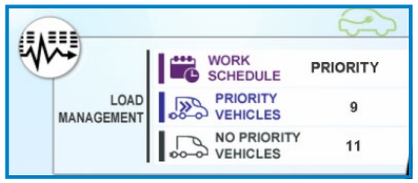
2 - Load Management Highlights

3 - Power Monitoring Highlights

4 - Charge Points communication status list

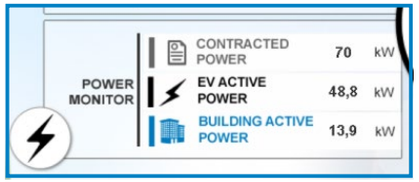
5 - Realtime Plug Status list

Load Management



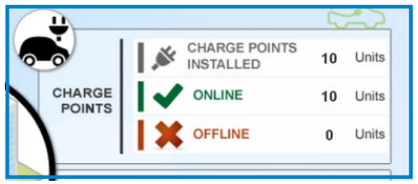
Time slot: priority / non-priority
Number of priority vehicles
Number of non-priority vehicles

Power Monitoring



Contracted power
EV's power consumption
Building power consumption

Charge Points



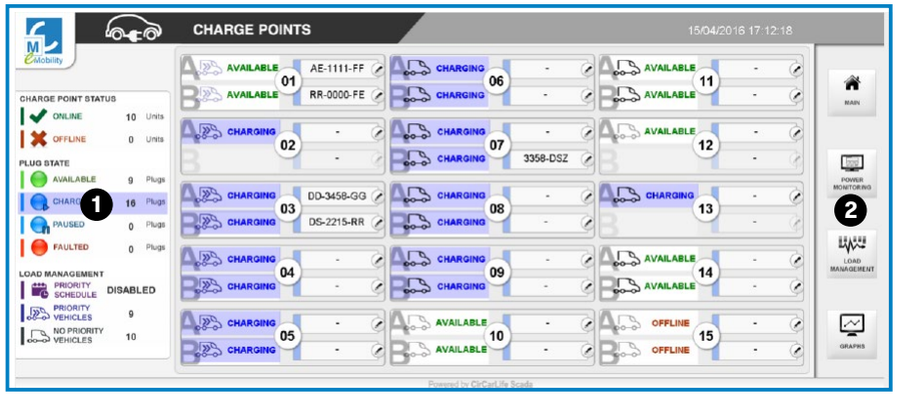
Charge Points installed
Charge Points connected
Charge Point disconnected

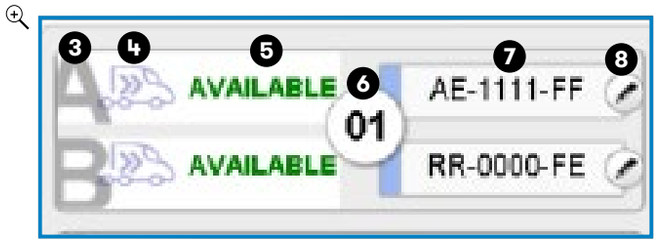
Plug Status

Plugs available
Plugs charging
Plugs in error

B Charge Points Sceen

Information about Charge Points and Plugs.

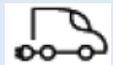




1 - Summary Table	**5 - Plug Status**
2 - Shortcut to Screens	**6- Charge Point Identifier**
3 - Plug Identifier	**7 - License Plate**
4 - EV Status Indicator	**8 - Modify License Plate**

EV Status indicator

EV indicator based on the priority and if a car is plugged in or not.

	Non-Priority / Not Plugged In
	Non-Priority / Plugged In
	Priority / Not Plugged In
	Priority / Plugged In

Plug Status

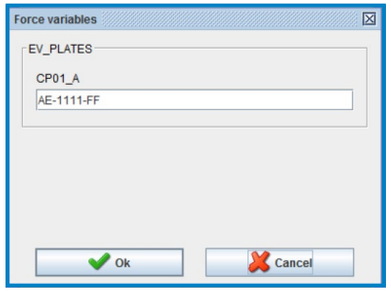
STATUS	DEFINITION
AVAILABLE	The plug is available and ready
CHARGING	The vehicle in this plug is charging
PAUSED	The charging transaction is paused
OFFLINE	Network connection failure between the Load Management System and the Charge Point
FAULTED	The Charge Point has some kind of error, please contact technical assitance
ERR. CFG	a) It is necessaty to modify the configuration parameters of the charge point.This will only happen while commissioning is taking place. b) It is necessary to install Offline Mode. (Load Management Tool)
DISABLED	The Charge Point is disabled.

License Plate

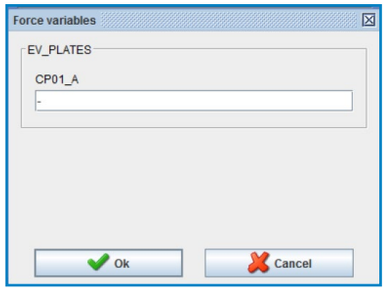
A License plate or Identifier can be assigned to a particular plug.

To assign a license plate to a certain Plug, click on button.

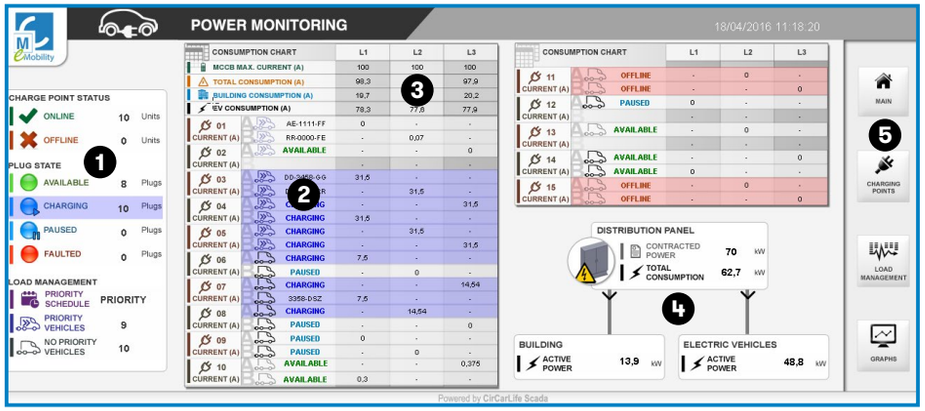
Next dialog will appear:



If no license plate is needed a '-' symbol must be placed, the field cannot be blank.



Power Monitoring Sceen



1 - Summary Table

2 - Charge Points Status

3 - Current consumption table per phase

4 - Distribution panel of different power consumption

5- Shortcut to Screens

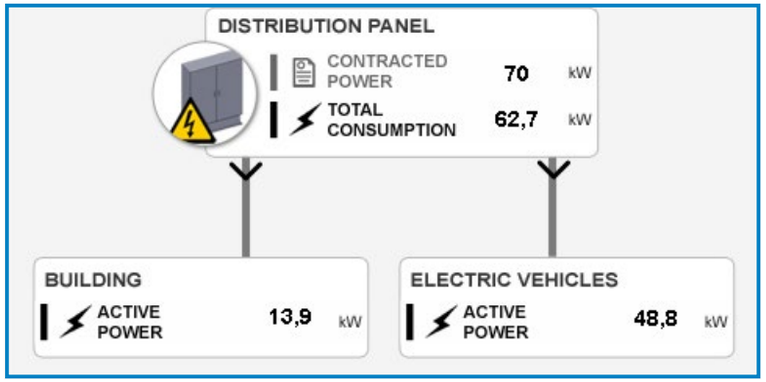
Consumption per phase

Information about real time power consumptions per each phase:

CONSUMPTION CHART	L1	L2	L3
MCCB MAX. CURRENT (A)	100	100	100
TOTAL CONSUMPTION (A)	98,3	97,6	97,9
BUILDING CONSUMPTION (A)	19,7	20,2	20,2
EV CONSUMPTION (A)	78,3	77,6	77,9

Distribution Panel

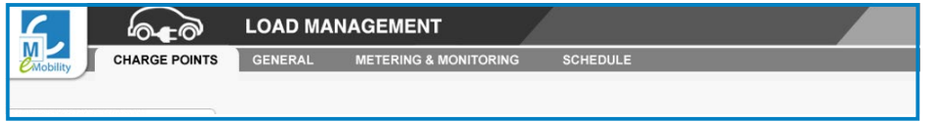
Shows the total power distribution between the building and electric vehicles in real time.



D Load Management Screen

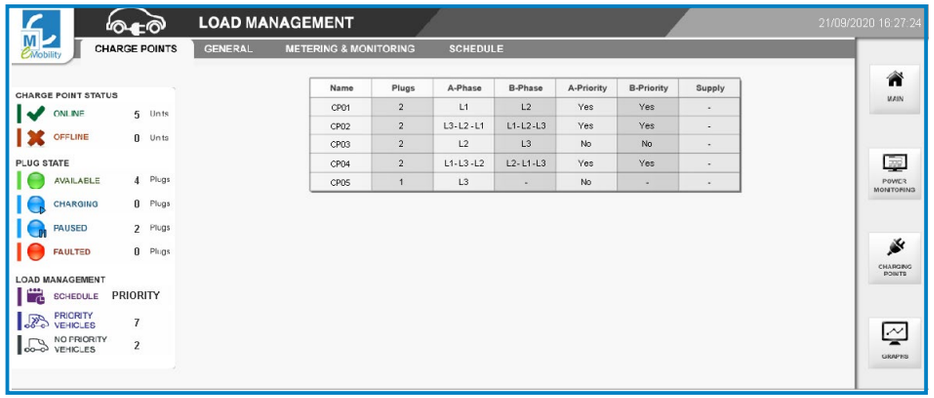
This section is destined to check, monitorize and set up the load management operation and Priority/Non-Priority work mode schedules.

Unlike the other scada screens, this one is divided in different ones:



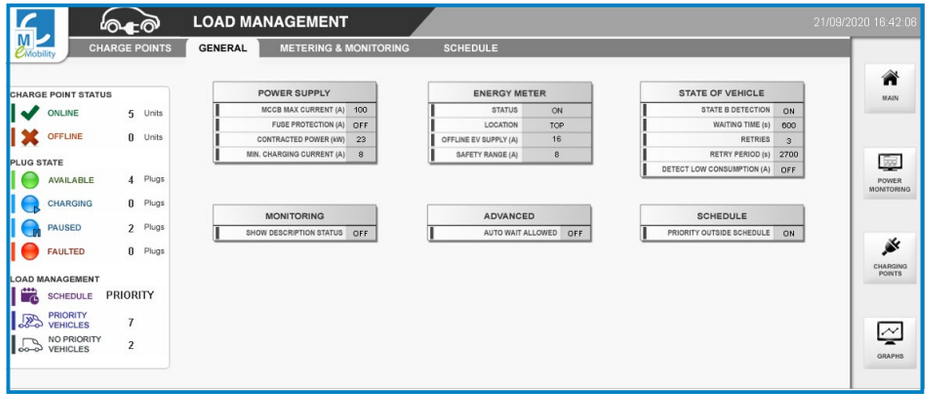
Charge Points Screen

Shows the list of charge points added and configured into Load Management Tool in order to facilitate checking the configuration made during commissioning.



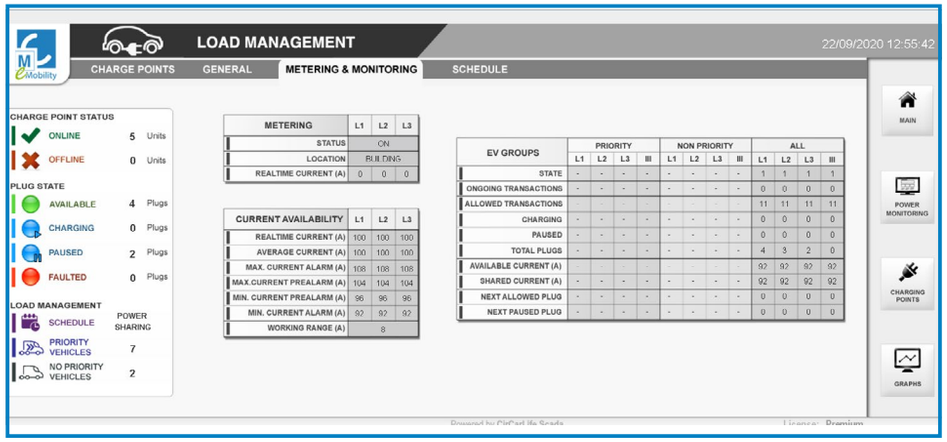
General Screen

Shows the general settings configured into Load Management Tool in order to facilitate checking the configuration made during commissioning.



Metering & Monitoring

This screen is reserved for service staff. It allows to check current measurements from Energy Meter and monitorice the state machine of Load Management.



Energy Meter

METERING	L1	L2	L3	
STATUS	ON			State of meter analyzer
LOCATION	BUILDING			Meter location (A: Building, B:Top)
REALTIME CURRENT (A)	0	0	0	Real time current (A) per phase

Analyzer

CURRENT AVAILABILITY	L1	L2	L3	
REALTIME CURRENT (A)	100	100	100	Available current per phase
AVERAGE CURRENT (A)	100	100	100	Calculated current average
MAX. CURRENT ALARM (A)	108	108	108	Most restrictive current
MAX.CURRENT PREALARM (A)	104	104	104	Max safety current
MIN. CURRENT PREALARM (A)	96	96	96	Min restrictive current
MIN. CURRENT ALARM (A)	92	92	92	Less restrictive current
WORKING RANGE (A)	8			Safety margin range

Safety Margin is a customizable parameter used to protect the installation from overloads or unexpected current peaks:

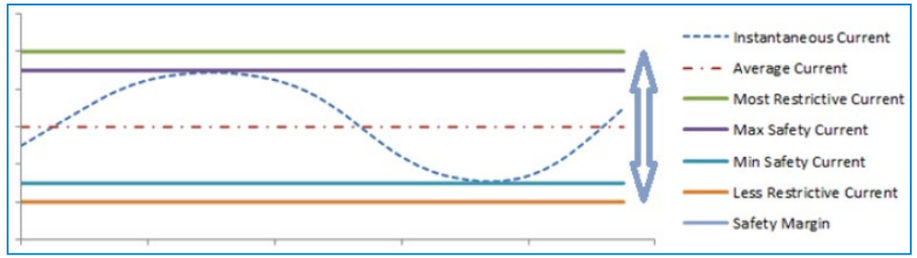


Table per phases

This table allows to follow in real time the state machine of Load Management.

The data will be shown in defferent columns depending on how "Priority Outside Schedules" work mode parameter has been configured. (Check section "Schedule" for further details)

When "Priority Outside Schedule" is enabled via Load Management Tool (If there is no calendar defined for priority, DLM makes **power sharing** with all the CP) the table shows all data in one column.

EV GROUPS	PRIORITY				NON PRIORITY				ALL			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
STATE	-	-	-	-	-	-	-	-	1	1	1	1
ONGOING TRANSACTIONS	-	-	-	-	-	-	-	-	0	0	0	0
ALLOWED TRANSACTIONS	-	-	-	-	-	-	-	-	11	11	11	11
CHARGING	-	-	-	-	-	-	-	-	0	0	0	0
PAUSED	-	-	-	-	-	-	-	-	0	0	0	0
TOTAL PLUGS	-	-	-	-	-	-	-	-	4	3	2	0
AVAILABLE CURRENT (A)	-	-	-	-	-	-	-	-	92	92	92	92
SHARED CURRENT (A)	-	-	-	-	-	-	-	-	92	92	92	92
NEXT ALLOWED PLUG	-	-	-	-	-	-	-	-	0	0	0	0
NEXT PAUSED PLUG	-	-	-	-	-	-	-	-	0	0	0	0

When "Priority Outside Schedule" is disabled via Load Management Tool (If there is no calendar defined for priority, this ones will not start charging) the table shows differentially Priority and Non-priority.

EV GROUPS	PRIORITY				NON PRIORITY				ALL			
	L1	L2	L3	III	L1	L2	L3	III	L1	L2	L3	III
STATE	6	6	6	6	1	1	1	1	-	-	-	-
ONGOING TRANSACTIONS	1	1	0	1	0	0	0	0	-	-	-	-
ALLOWED TRANSACTIONS	15	15	15	15	15	15	15	15	-	-	-	-
CHARGING	0	0	0	0	0	0	0	0	-	-	-	-
PAUSED	1	1	0	1	0	0	0	0	-	-	-	-
TOTAL PLUGS	4	2	1	0	0	1	1	0	-	-	-	-
AVAILABLE CURRENT (A)	94	94	94	94	94	94	94	94	-	-	-	-
SHARED CURRENT (A)	94	94	94	94	94	94	94	94	-	-	-	-
NEXT ALLOWED PLUG	7	8	0	0	0	0	0	0	-	-	-	-
NEXT PAUSED PLUG	0	0	0	0	0	0	0	0	-	-	-	-

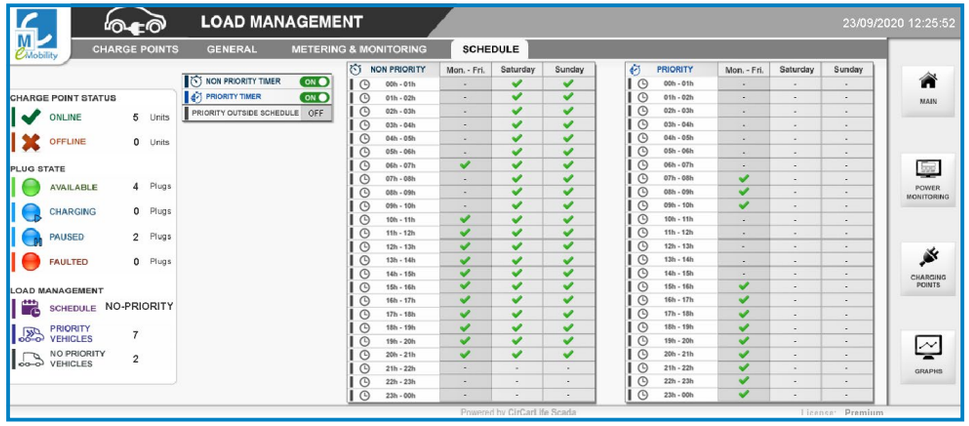
STATE	Load Management State [1]
ONGOING TRANSACTIONS	Number of transactions started in each phase
ALLOWED TRANSACTIONS	Number of transaction allowed in each phase
CHARGING	Number of Plugs Charging in each phase
PAUSED	Number of Plugs Paused in each phase
TOTAL PLUGS	Number of Plugs Connected in each phase
AVAILABLE CURRENT (A)	Current available in each phase
SHARED CURRENT (A)	
NEXT ALLOWED PLUG	Next plug to resume per each phase
NEXT PAUSED PLUG	Next plug to be paused per each phse

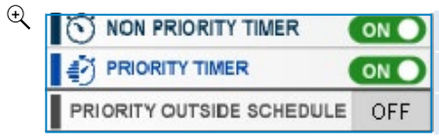
[1] There are five Load Management States, these ones are dynamic and change based on active Charging Transactions and available power:

STATE	DESCRIPTION	COMMENTS
1	Available Power	All active Charging Transactions can charge simultaneously at least at the minimum current.
2	Power decreasing	New Charging Transactions start progessively without exceeding the contracted power.
3	Limited Power	New Charging Transactions are paused until there is enough power back again.
4	Power exceeded	Not all active Charging Transactions can charge simultaneously and one or more need to be paused in order to avoid an overload.
5	Unavailable power	Not enough power available and all Charging Transactions are paused.
6	Unavailable Charging	Charging Not allowed due to schedule

Schedule Screen

This screen allows to set up an schedule for both Priority and Non-Priority work modes.





NON PRIORITY TIMER	Enable / Disable NON-PRIORITY schedule
PRIORITY TIMER	Enable / Disable PRIORITY schedule
PRIORITY OUTSIDE SCHEDULE	[1] Shows the status set for "priority outside schedule"

Once schedules are enabled it is necessary to Mark or Unmark the time slots differentiating between weekdays, saturday and sunday:

NON PRIORITY	Mon. - Fri.	Saturday	Sunday
00h - 01h	-	✔	✔
01h - 02h	-	✔	✔
02h - 03h	-	✔	✔
03h - 04h	-	✔	✔
04h - 05h	-	✔	✔
05h - 06h	-	✔	✔
06h - 07h	✔	✔	✔

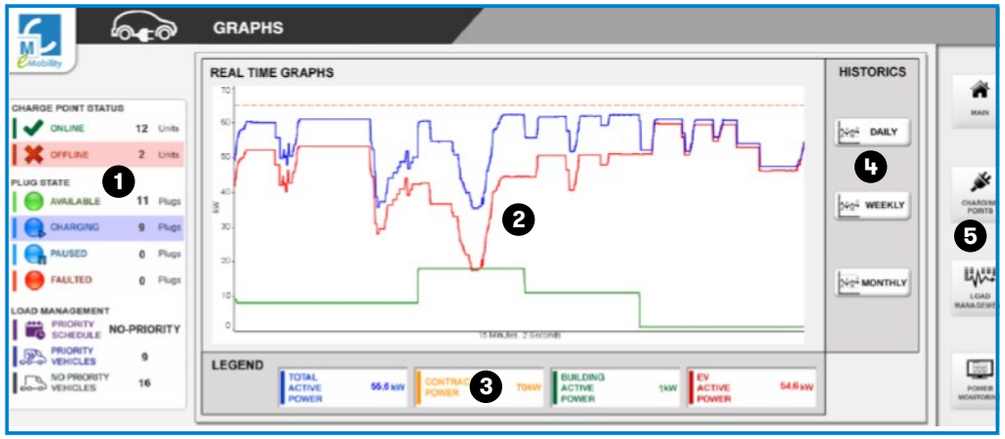
[1] Depending on the status set on "Priority Outside Schedule" and both schedules, Charging will be possible for neither, one or both Plugs working modes (Priority and Non-Priority).

TIME SLOT MARKED (1) OR UNMARKED (0)		PRIORITY OUTSIDE SCHEDULE	
NON-PRIORITY	PRIORITY	ENABLED	DISABLED
0	0	Charge Not Allowed	Charge Not Allowed
1	0	Power Sharing	Non-Priority
1	1	Non-Priority + Priority	Non-Priority + Priority
0	1	Priority	Priority

E Graphs Screen

Shows the building and EV power consumption and the sum of both (total active power) in real time, comparing it with contracted power.

Historical graphs can be generated for daily, weekly and monthly periods.



1 - Summary Table	**4 - Historical Graphs**
2 - Real Time Graphs	**5- Shortcut to Screens**
3 - Legend	

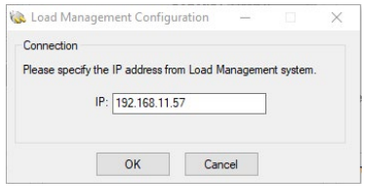
6 Appendix 1

DLM setup guide

1. Assign IP's to the chargers, TCP2RS+ (Kit Power Analyzer) and DLM hardware (DLM Conec) using IPSetup tool:

- Will be necessary to annotate the MAC address of the devices previously.

2. Open "Load Management Tool" and connect to DLM hardware:



2.1. Define all necessary settings from "General" tab. See section 4B General Settings of this manal.

2.2. Add each of the Charge Points from "Charge Points" tab. See section 4B 'Charge Points' of this manual.

2.3. Configure the offline work mode and Install this Setup to all the charge points. See section 4B 'Offline Mode' of this manual.

2.4. Save all the setting made into a file as a backup. See section 4B 'Restore/Save' configuration of this manual.

2.5. Press "Save" button (located in the lower right) to send all setting made to DLM hardware.

3. Open an applet SCADA to monitor Dynamic Load Management screens.

Scada screens can also be viewed through HTML5 browser application:
IP/html5/index.html

3.1. Go to "Charge Points" screen an modify the license plates on each plug if needed. See section 5B of this manual.

Check "plug status" information. If "ERR. CFG" is shown in a specific plug, be sure that step 2.3 of this guide has been done.

3.2. Go to section "Schedule" from Load Management screen in order enable/disable Priority and Non-Priority schedules. In case of enable them, select the required time slots periods. See section 5D 'Schedule screen' of this manual.

4. Navigate through the different screens to check if all the devices are communicating correctly and all parameters has been well setted up

7

Load Management Policy

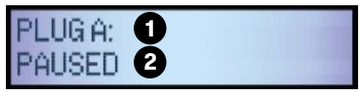
In both groups (priority and/or standard plugs) the load management policy works as follows:

1. Available current is equally distributed on each occupied plug

2. System pause one by one the existing charging transactions if the available current is not enough to keep charging all the plugs simultaneously.

3. Plugs remain paused until enough power is available back again. The charge point display shows:

or



1 - Plug name (Plug A - B) **2- Plug Status**

4. System resumes all the paused charging transaction one by one as a queue and regulating the current on each plug without exceeding the contracted power.

5. System also resumes a paused charging transaction after one vehicle has the battery fully charged.

6. System pauses a charging transaction if the EV switches to State B after a short period of time, in addition it is queued and the current now is distributed to other active charging transaction. * This is an optional parameter and can be modified if necessary.

Appendix 2

7. Each plug has one ID internally assigned. This **IDs cannot be changed:**

CHARGE POINT	PLUG	ID
01	A	1
	B	2
02	A	3
	B	4
03	A	5
	B	6
04	A	7
	B	8
05	A	9
	B	10

*Example for DLM Conec (5 Charge Points supported)

These IDs are only needed in following cases:

A. Insufficient power to keep charging all plugs simultaneously at 6A

B. Enough power available to resume existing paused charging transactions.

Case A

Existing started charging transactions are become paused until not exceed the maximum contracted power from the highest plug ID to the smallest one.

EXAMPLE

Charging ID plugs: 1,2,3,4

Plug ID queue: 4 → 3 → 2

- Not enough power to have 4 plugs charging simultaneously. Plug ID=4 is the first one to pause.
- Not enough power to have 3 plugs charging simultaneously. Building + EV real-time consumptions are exceeding the contracted power. ID=3 is the following to pause.
- Exceeding contracted power. ID=2 is paused
- ID=1 remains charging. Building + EV real-time consumptions are less than contracted power.

Case B

Existing paused charging transaction are resumed from the smallest ID to the highest one.

EXAMPLE

Charging ID plugs: 1,2,3,4

Plug ID queue: 2 → 3 → 4

- Building + EV real-time consumptions are less than contracted power. Plug ID=2 is the first one to resume.
- 2 plugs are now charging simultaneously. Building + EV real-time consumptions are than contracted power. ID=3 is the following to resume.
- 3 plugs are now charging simultaneously. Resuming plug ID=4.
- 4 plugs now charging simultaneously. Building + EV consumptions don't exceed the contracted power.

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7 Need help?

In case of any query or need further information, please contact our **Post-Sales Department**

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CIRCONTROL
Mobility & eMobility

DYNAMIC LOAD MANAGEMENT INSTRUCTION MANUAL

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