

USER'S MANUAL

LBC

EN-Meter-02-40

AZZURRO
ZCS

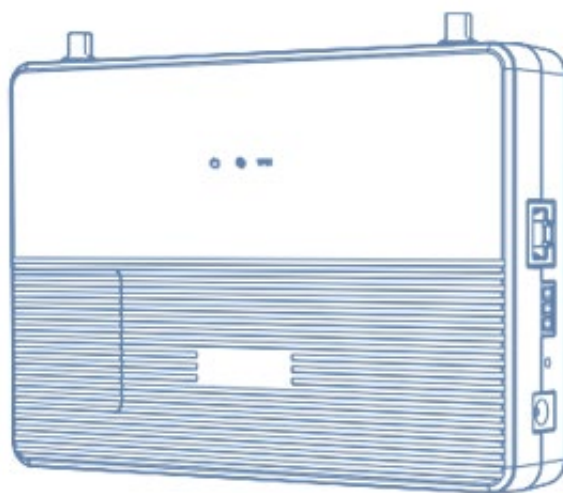
SISTEMI FOTOVOLTAICI INTELLIGENTI
PER LA TUA INDIPENDENZA ENERGETICA



LBC

EN-Meter-02-40

User Manual



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General Instructions

This manual contains important safety precautions that must be followed and observed during the installation and maintenance of the equipment.

Keep these instructions safe!

This manual must be regarded as an integral part of the equipment and must be available at all times to anyone who uses the equipment. The manual must always accompany the equipment, even when it is sold to another user or moved to another site.

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Technical support

ZCS offers a technical support service which can be accessed by submitting a request directly via the website www.zcsazzurro.com

The following freephone number is available for Italy: 800 72 74 64.

Foreword

General Information

Please read this manual carefully before proceeding with installation, use or maintenance.
 This manual contains important safety precautions that must be followed and observed during the installation and maintenance of the equipment.

Scope

This manual describes the assembly, installation, electrical connections, commissioning, maintenance and troubleshooting of the LBC EN-Meter-02-40.
 Keep this manual in a safe place so that it is accessible at all times.

Intended Audience

This manual is intended for qualified technical personnel (installers, technicians, electricians, technical support staff or anyone qualified and certified to work on electrical installations) responsible for the installation and commissioning of the LBC EN-Meter-02-40, as well as for the operators of such installations.

Symbols used

The following types of safety instructions and general information appear in this document as described below:

	"Danger": indicates an imminent hazardous situation which, if the appropriate precautions are not taken, will result in death or serious personal injury.
Danger	
	"Warning": indicates a hazardous situation which, if not avoided, could result in death or serious injury
Warning	
	"Caution": means that, unless the appropriate safety measures are taken, a potentially hazardous situation may occur which could result in minor injury.
Caution	
	"Caution": indicates a potentially hazardous situation which, if the appropriate safety measures are not taken, could result in property damage.
Caution	
	"Note": provides additional information or suggestions to help you carry out the operations.
Note	

1. Product Introduction

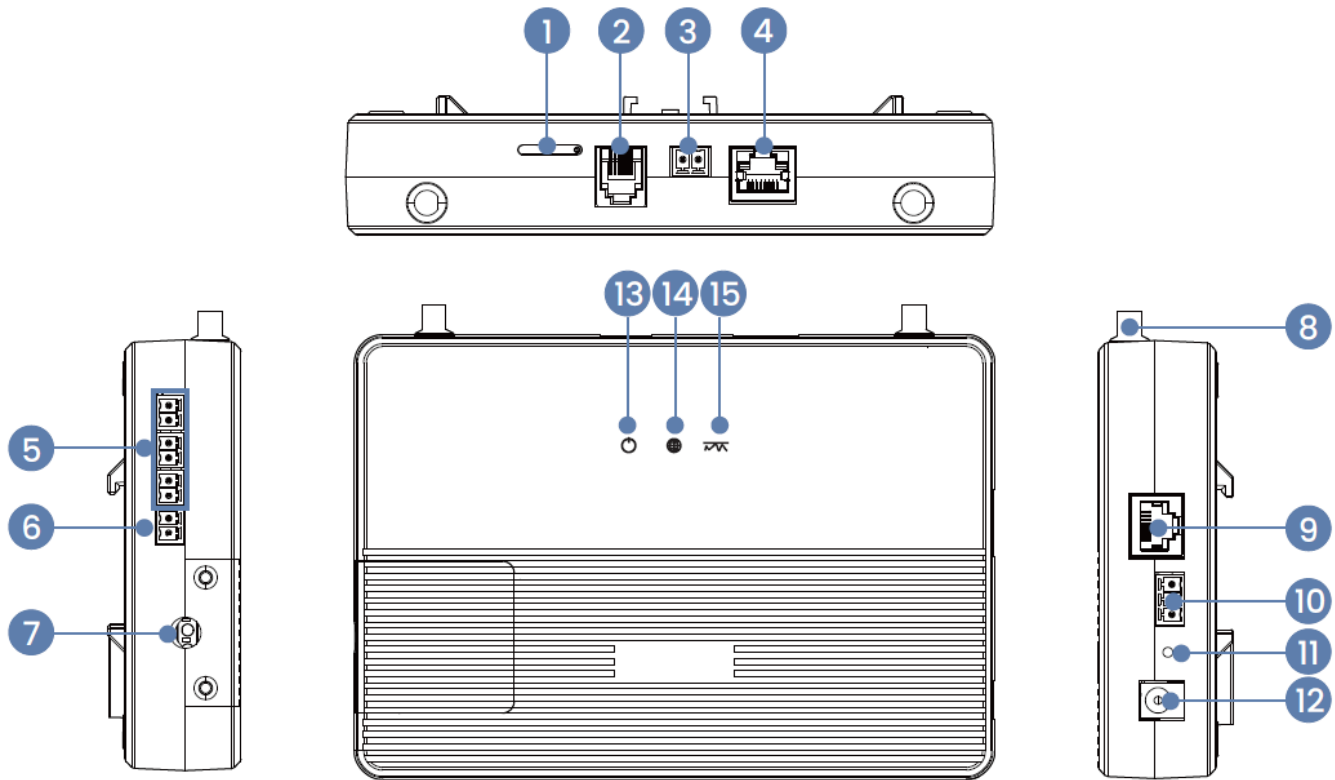
The Load Balancing Controller (LBC) is an innovative device equipped with various current distribution strategies that improve the stability of the charging system. The LBC has three connections for current transformers (CTs) and supports three different communication methods (Wi-Fi, 4G and Ethernet), enabling its use in a wide range of installation scenarios.

LBC features:

- Dynamic load balancing between chargers and the building
- Installation of multiple chargers (even hundreds) in any building or charging station with DC and AC wallboxes.

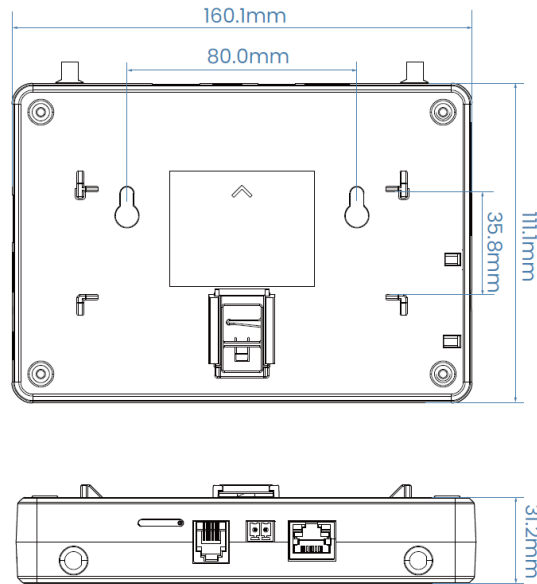
1.1. Product overview

1.1.1. External overview



Number	Meaning	Number	Meaning
1	SIM card slot	9	Ethernet port
2	RJ12 port	10	Reserved port
3	RS485 port for the meter	11	Reset button
4	RJ45 port	12	DC input
5	Port	13	Power indicator
6	Dry contact	14	Network status indicator
7	AC input	15	Operating indicator
8	Antenna (Wi-Fi, left; 4G, right)		

1.1.2. Product dimensions



1.1.3. Indicators

Indicator	Indicator status	LBC status
 Power	Light on continuously	Normal operating status.
 Mains status	Steady light	Stable network connection, connected to the cloud.
	Flashing light	Network error.
 Operating status	Steady light	LBC controlled by the cloud platform.
	Off	LBC deactivated.

2. Safety information



IMPORTANT: The installer and end users must read and understand the contents of this manual before installing and/or using the LBC

Installation must only be carried out by qualified and competent personnel, in accordance with the legislation in force at the installation site.

The manufacturer accepts no liability for improper installations or problems resulting from incorrect installation.

	Any damage to the LBC, to systems connected to it or to other property resulting from non-compliant installation is the sole responsibility of the installer.
Note	

If you have any doubts or encounter any problems after reading the following information, please contact Zucchetti Centro Sistemi S.p.A.

This chapter sets out the safety information relating to the installation and operation of the device.

2.1. Safety information

Read and understand the instructions contained in this manual before beginning installation of the device and rectify any errors.

- Disconnect the mains power supply before starting installation and keep it disconnected throughout the installation process.
- Keep unauthorised personnel at a safe distance from the work area.
- Carry out all electrical connections in accordance with current local and national regulations.
- Use cables with a cross-section and insulation characteristics suitable for the system's rated current and voltage.
- Lay and secure the internal wiring in such a way as to protect it from mechanical damage and ensure it does not obstruct maintenance operations.
- Install the LBC in a location protected from water and potential leaks.
- Wear appropriate personal protective equipment (PPE) during installation and maintenance operations.

2.2. Transport requirements

Upon receipt of the product, check that the packaging and the LBC are undamaged.

If there is any damage to the packaging or obvious signs of damage to the product, inform the carrier immediately and, if necessary, contact the installer or the customer support service at Zucchetti Centro Sistemi S.p.A.

3. Installation

3.1. Pre-installation check

Before opening the LBC packaging, check that the outer packaging is not damaged (e.g. holes or tears) and verify the model. If any damage is found, do not open the product packaging and contact your distributor as soon as possible.

3.2. Contents of the packaging

Inspect the packaging and accessories carefully before installation.
 The packaging must contain the following accessories/components:

WALL INSTALLATION:

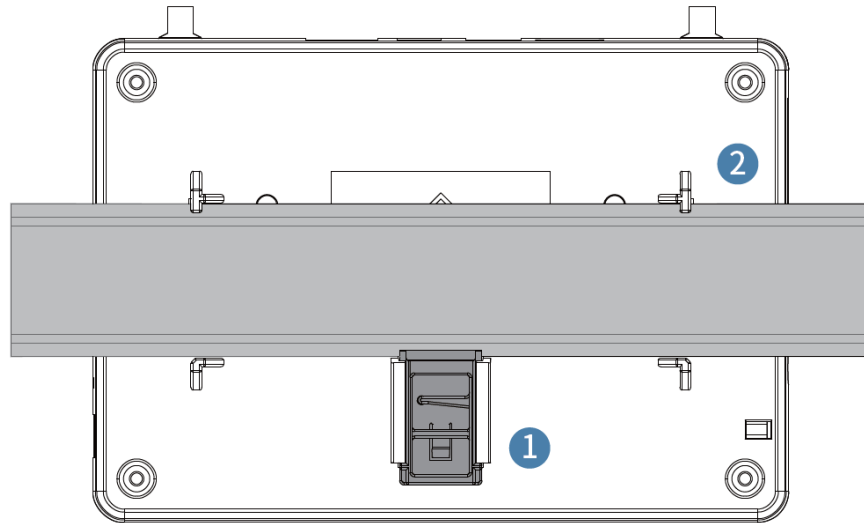
No.	Description	Quantity/PCS
1	Load Balancing Controller Pro	1
2	Wi-Fi Antenna	1
3	4G antenna	1
4	AC power cable	1
5	2-pin connector for dry contact	1
6	CT connector	3
7	Wall socket	2
8	Wall-mounting screw	2

9	Cable tie	1
10	Screw for cable tie	2
11	SIM ejector pin	1

Figure1 – Inverter components and accessories included in the packaging (WALL-MOUNTED INSTALLATION)

3.3. Installation

3.3.1. Mounting on a DIN rail



STEP 1: Gently pull the latch downwards.

STEP 2: Carefully slide the guide horizontally into the rear of the LBC.

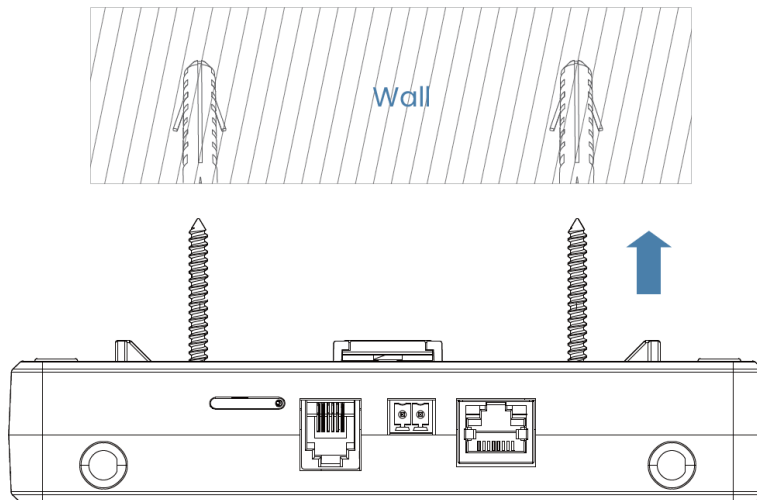
STEP 3: Release the latch to lock the guide into place.



Note

The DIN rail is not included in the device's packaging; you will need to provide the DIN rail yourself.

3.3.1. Wall mounting



Top view

STEP 1: Drill holes in the wall.

STEP 2: Insert the wall plugs into the holes.

STEP 3: Insert the wall-fixing screws into the wall plugs, leaving a 5 mm gap between the screw head and the wall to create a hook.

STEP 4: Hang the LBC on the protruding screw heads.

3.4. Connecting the AC power cables

Follow national standards and regulations for the installation of external relays or circuit breakers!

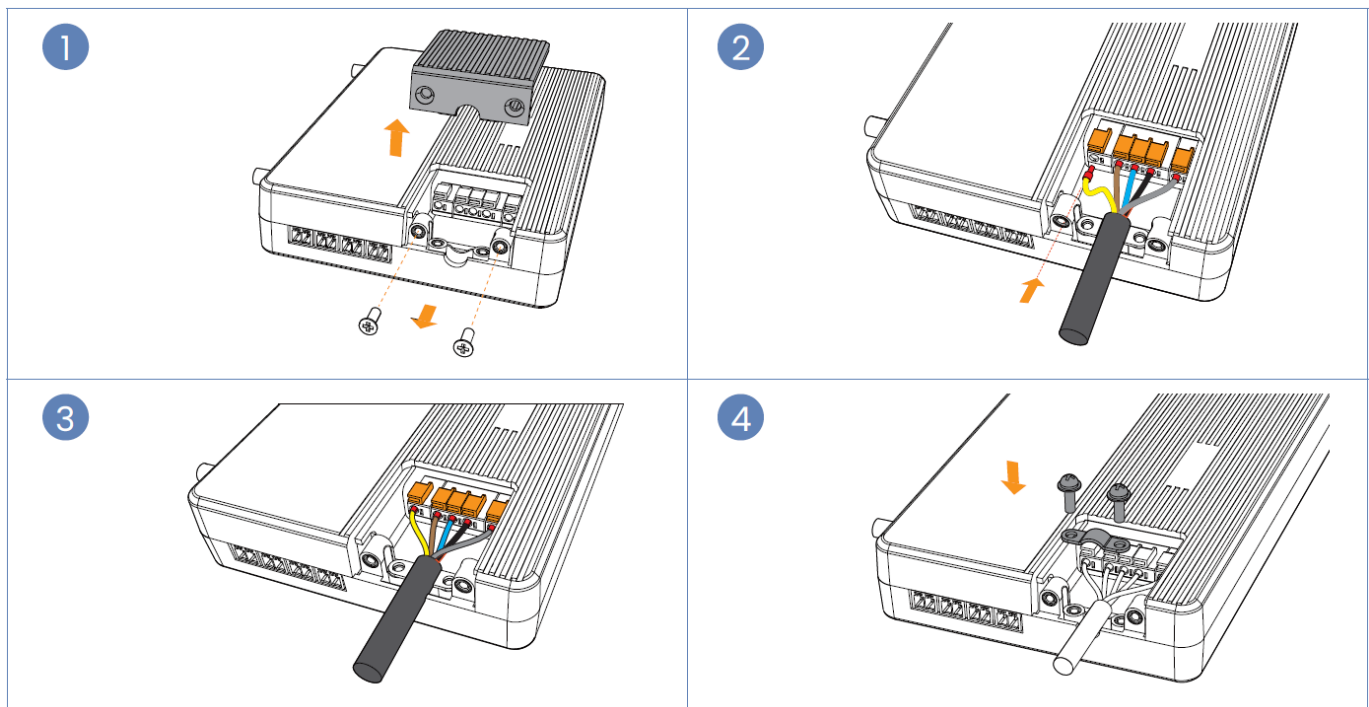
Install any external relays, circuit breakers and other protective devices in accordance with current national and local regulations.

Select the AC power cable in accordance with applicable regulations, taking into account the device's rated current, installation conditions, ambient temperature, cable length and permissible voltage drop.

CAUTION

Disconnect the power supply and check that there is no voltage present before carrying out any wiring work.

Connect the PE, L1, L2, L3 and N conductors to the corresponding terminals in accordance with the wiring diagram.

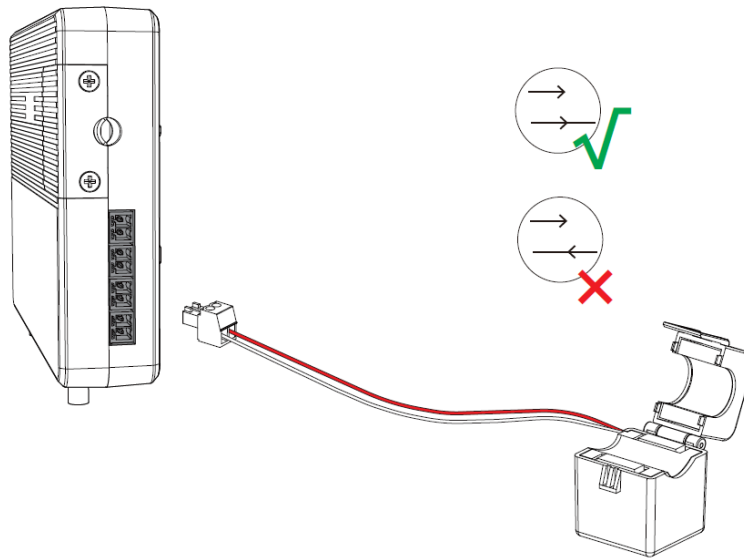


Note

Press the small yellow release button to release, if necessary, the conductor secured by a terminal cap.

3.5. CT connection (if required)

- White cable to CT+
- Red wire to CT-



Note

There is an 'arrow' on the CT indicating the direction of current flow.

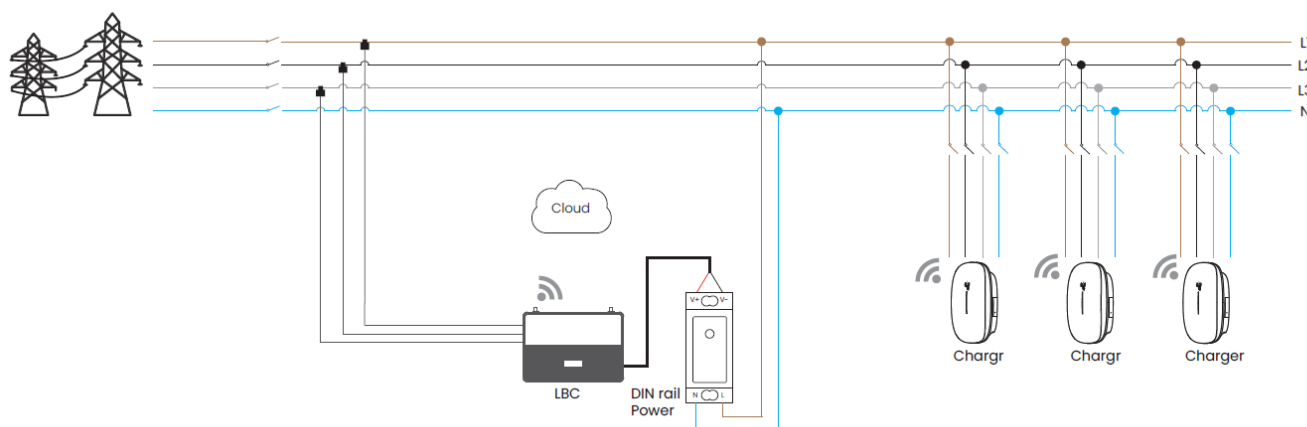
4. Application scenario

Implementation of the load balancing function consists of the following three stages:

- **Current measurement**
 - Current transformer (CT) rated at 100 A, 200 A, 600 A or 1000 A;
 - Current transformer (CT) + Meter (up to 1500 A);
 - Meter (P1/HAN/RS485 interface).
- **Network communication**
 - 4G network;
 - Ethernet;
 - 2.4 GHz Wi-Fi.
- **Load balancing configuration**
 - Via Cloud Control;
 - Via local network control (Ethernet).

4.1. Public scenario

The public scenario is recommended for installations with multiple charging stations. In this configuration, load balancing is managed by the Evcharge cloud platform.



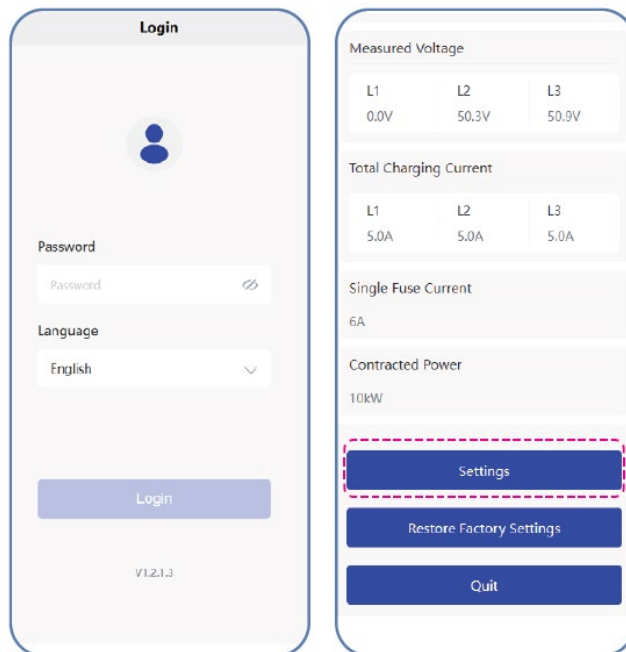
Note

This scenario is compatible with all types of chargers that support OCPP 1.6J and run on the Evcharge platform.

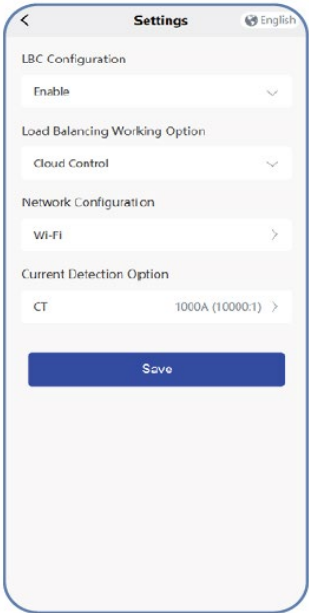
5. Network configuration for LBC

5.1. Log In

- Turn on Wi-Fi on your phone.
- Switch on the LBC's power supply to activate its Wi-Fi hotspot.
- Look for the LBC's Wi-Fi hotspot in your phone's Wi-Fi list. The hotspot name corresponds to the LBC's serial number.
- Enter the password (found on the last page of the manual) to connect your phone to the LBC.
- Access the AP mode login page by opening a browser and typing 192.168.4.1. Then, log in using the PIN provided in the manual.



5.2. settings

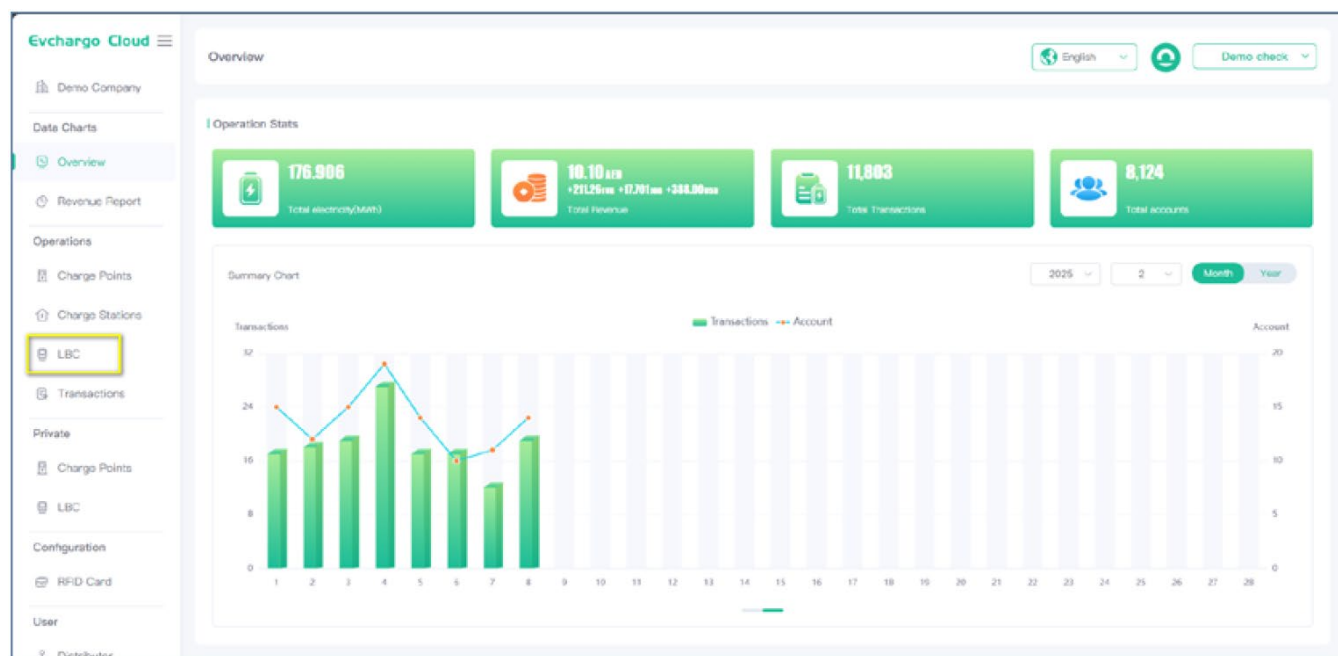
LBC Configuration	Enable.	
Load balancing option enabled	Cloud control	
Configuration	Wi-Fi, 4G or Ethernet.	
Current detection option	Without a smart meter: CT	

	LBC operates using algorithms from the cloud platform, which means that real-time adjustments and optimisations are managed by the cloud. Ensure that the device is correctly connected to the platform to achieve optimal performance.
	Once you have finished configuring the LBC, you must tap 'Confirm'. The

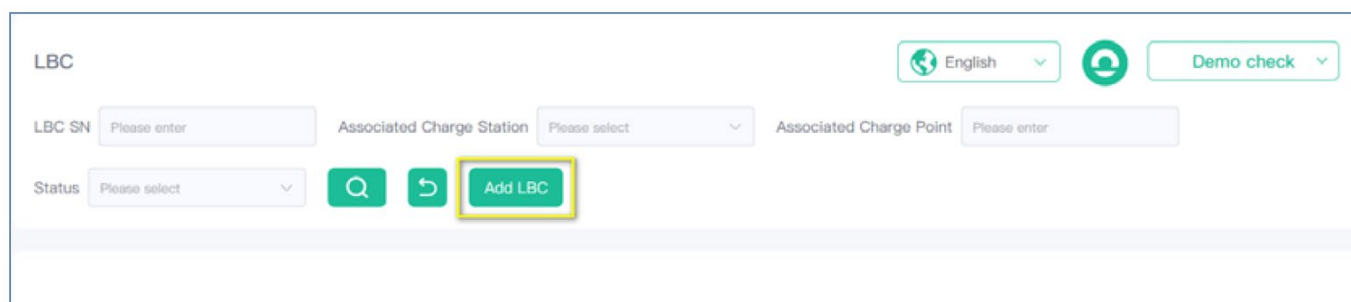
6. Configure the LBC on the EV CHARGO cloud platform and adjust the settings

Log in to the Evcharge cloud platform by visiting <https://cloud.evcharge.com>, then enter your username and password.

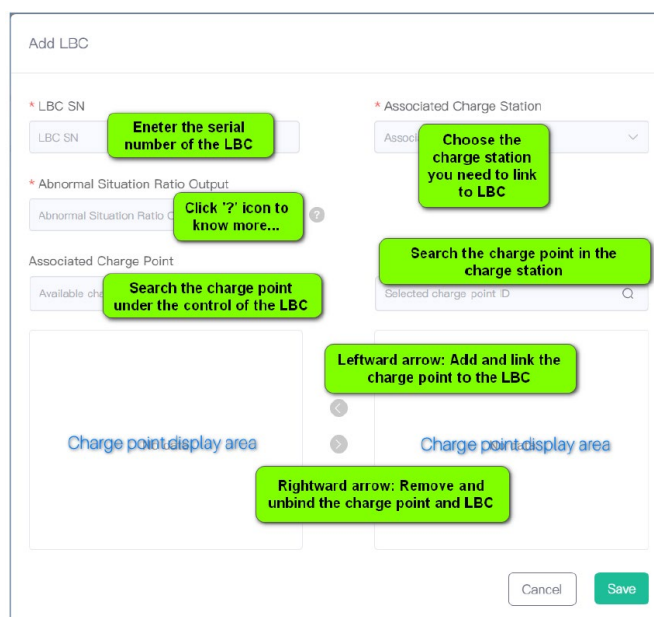
Click on “LBC”.



Click on “Add LBC”.



Enter the required information, then click "Save".



The screenshot shows the 'Add LBC' form with the following fields and annotations:

- * LBC SN:** A text input field with the annotation "Enter the serial number of the LBC".
- * Associated Charge Station:** A dropdown menu with the annotation "Choose the charge station you need to link to LBC".
- * Abnormal Situation Ratio Output:** A text input field with a question mark icon and the annotation "Click '?' icon to know more...".
- Associated Charge Point:** A section containing:
 - Available charge point:** A list box with the annotation "Search the charge point under the control of the LBC".
 - Selected charge point ID:** A text input field with a search icon and the annotation "Search the charge point in the charge station".
 - Charge point display area:** Two empty boxes labeled "Charge point display area".
 - Leftward arrow:** A button with a leftward arrow and the annotation "Leftward arrow: Add and link the charge point to the LBC".
 - Rightward arrow:** A button with a rightward arrow and the annotation "Rightward arrow: Remove and unbind the charge point and LBC".
- Buttons:** "Cancel" and "Save" buttons at the bottom right.

LBC serial number (LBC SN): enter the LBC's serial number.

Abnormal Situation Ratio Output: click on the "?" icon to view further information.

Associated Charge Point: allows you to search for the charge point managed by the LBC.

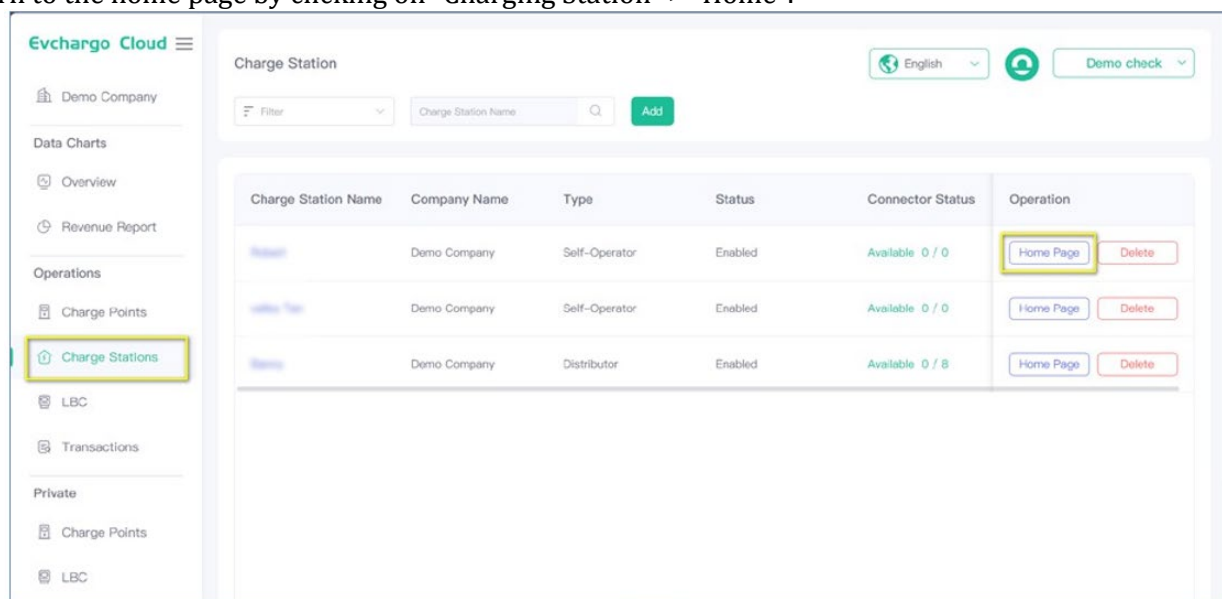
Associated Charge Station: select the charging station to associate with the LBC.

Select Charge Point ID: allows you to search for the charge point within the selected charge station.

Leftward Arrow: adds and associates the charge point with the LBC.

Right-pointing arrow: removes the association between the charging point and the LBC.

Return to the home page by clicking on “Charging Station” > “Home”.



Evcharge Cloud

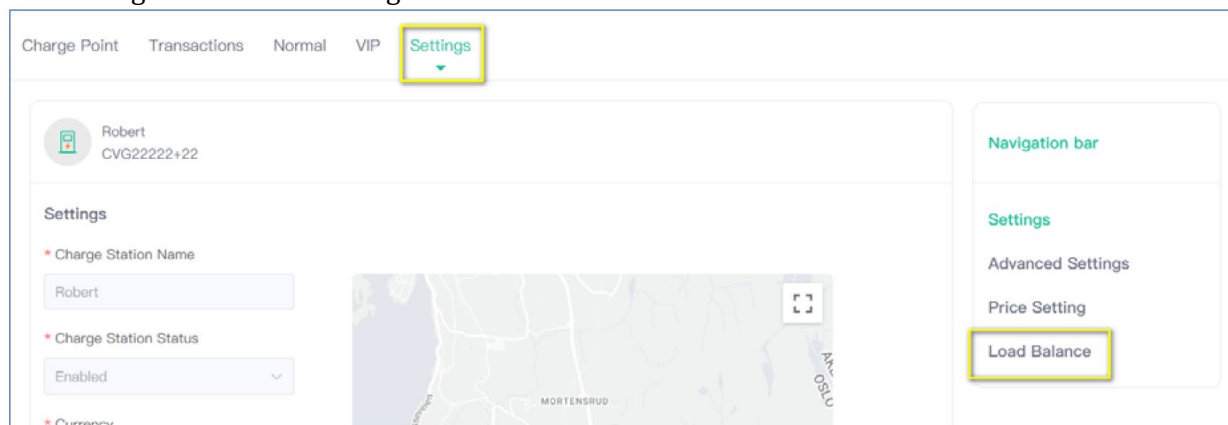
Charge Station

English Demo check

Filter Charge Station Name Add

Charge Station Name	Company Name	Type	Status	Connector Status	Operation
Robert	Demo Company	Self-Operator	Enabled	Available 0 / 0	Home Page Delete
Robert	Demo Company	Self-Operator	Enabled	Available 0 / 0	Home Page Delete
Robert	Demo Company	Distributor	Enabled	Available 0 / 8	Home Page Delete

Click on “Settings” > “Load Balancing”.



Charge Point Transactions Normal VIP Settings

Robert CVG22222+22

Settings

* Charge Station Name Robert

* Charge Station Status Enabled

* Currency

Navigation bar

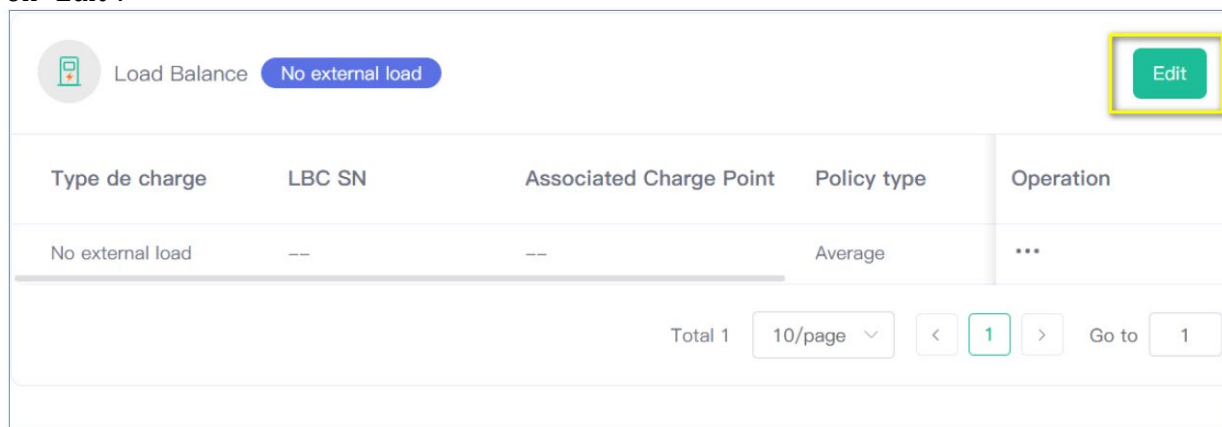
Settings

Advanced Settings

Price Setting

Load Balance

Click on “Edit”.



Load Balance No external load Edit

Type de charge	LBC SN	Associated Charge Point	Policy type	Operation
No external load	--	--	Average	...

Total 1 10/page < 1 > Go to 1



External load
Inclusive power supply



No external load
Exclusive power supply

Edit Load Balance

* LBC SN

Please select

Choose the LBC in the dropdown list

▼

* Mode

Please select

Choose the load balancing strategy

▼

* Max single-phase current (A)

Max single-phase current (A)

The maximum current of each individual phase

* Status

☒ Enable

☐ Disable

Load-Balance Strategy

Average:

The available power of the station will be distributed to all the charge points which is in charging state.

Advanced average:

The charge station will give priority to fully charging designated charge points, while the remaining charge points will employ an average charging approach for electric vehicles.

Full Load:

The available power is distributed to the charge points entering the charging state in chronological order. The charge points that are assigned power are charged at the maximum power, and other charge points that are not assigned power need to wait until the occupied power is released

Cancel

Save

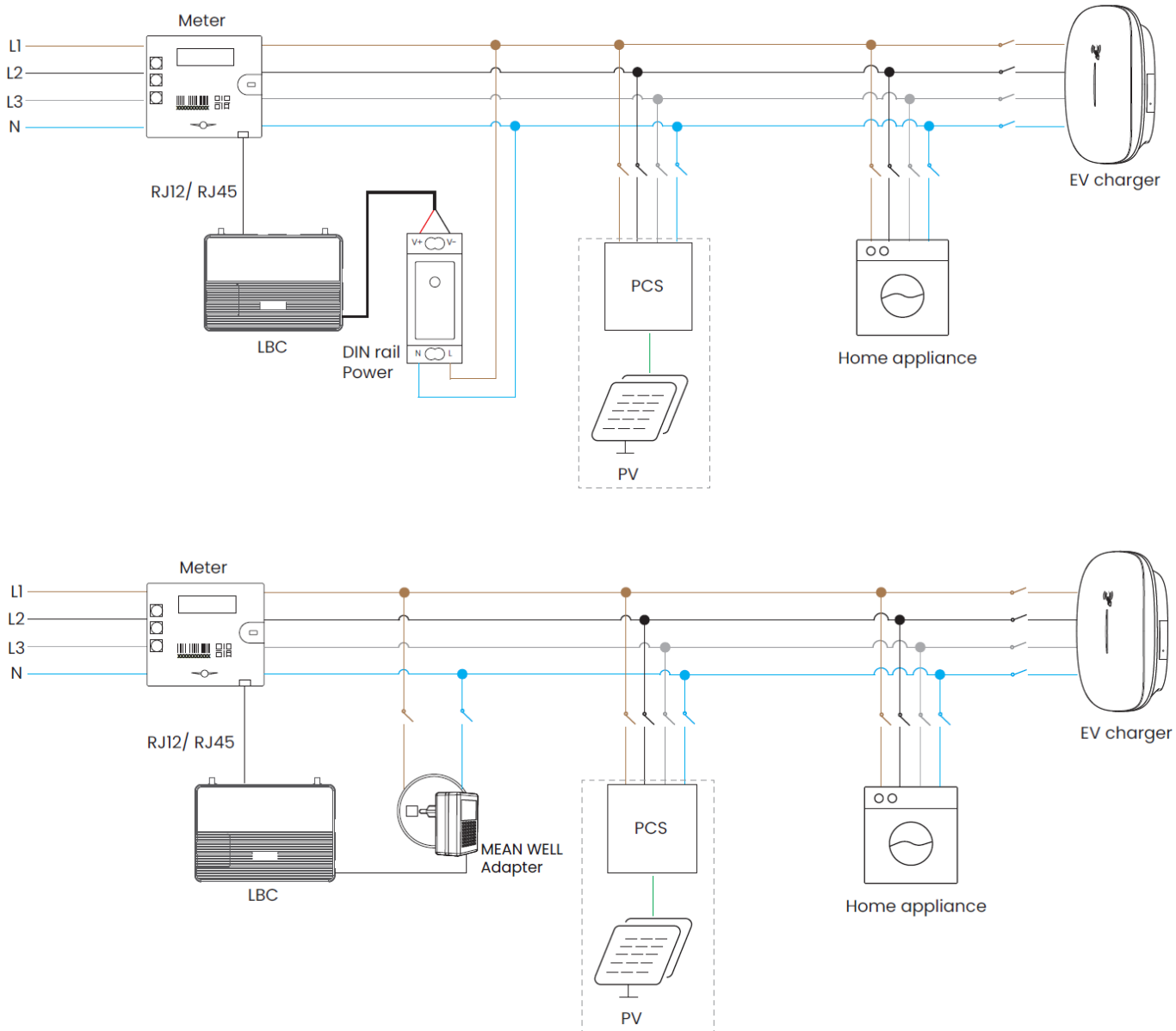
Maximum single-phase current (A): set the maximum permitted current for each phase, expressed in amperes (A).

Identification: GID-GE-MD-00
Rev. 04 dated 19 June 24 – Application: GID

7. Private Scenario

7.1. Home charging with a Smart Meter

- The property is fitted with a meter equipped with a HAN or P1 interface.
- The system may include an electric vehicle charging station, domestic appliances, a battery storage system, a power conversion system (PCS) and a photovoltaic system.
- The system is designed to ensure efficient and optimised management of energy flows.

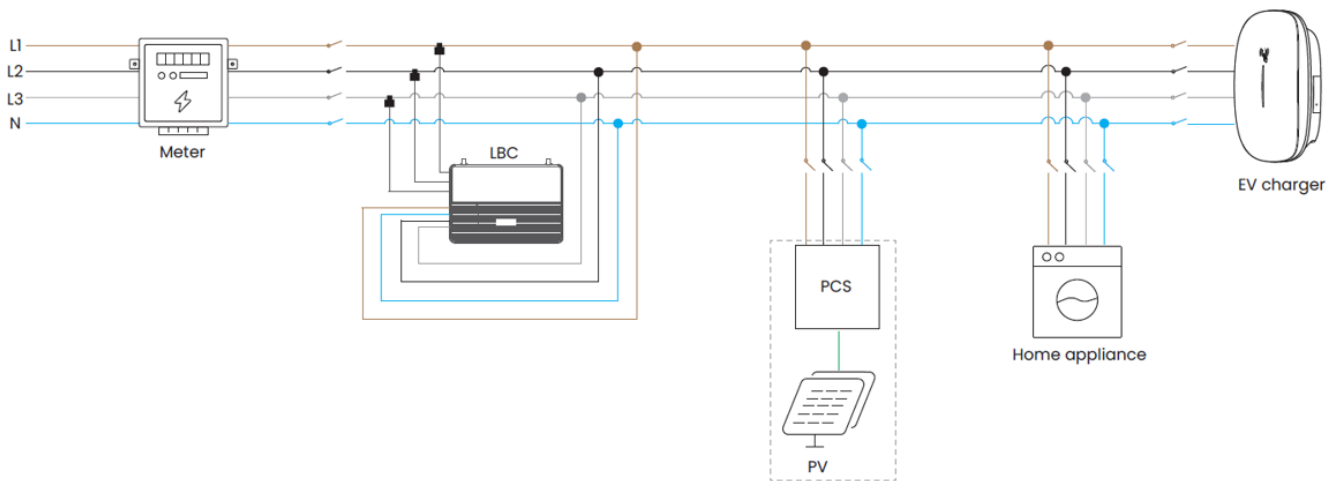


Connect the LBC to the smart meter using an RJ12 or RJ45 cable.
Power the LBC by connecting it to a DIN-rail power supply or a mains adapter.
Set the LBC to AP mode and configure it via the mobile app.

7.2. Home charging without a smart meter

If your home does not have a smart meter with a HAN or P1 port, we recommend using a current transformer (CT) to measure the building's power consumption.

- If you wish to use surplus solar power to charge your electric vehicle, the LBC must be connected to the home's main power supply.
- This allows the LBC to detect the direction and power flow of the solar energy, ensuring that the system prioritises the use of solar energy for charging



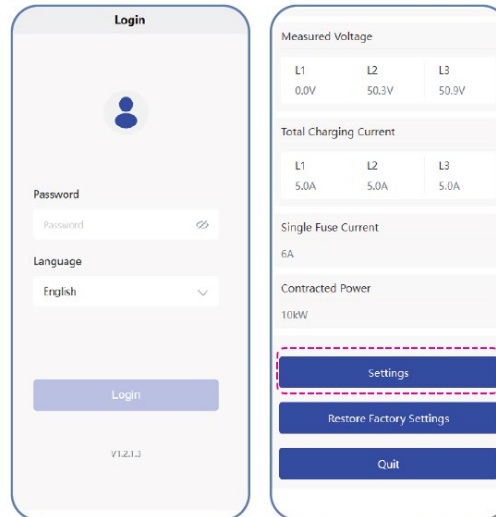
Note

To enable the electric vehicle to be charged in this scenario, the LBC's AC power cable must be connected to the main mains supply.

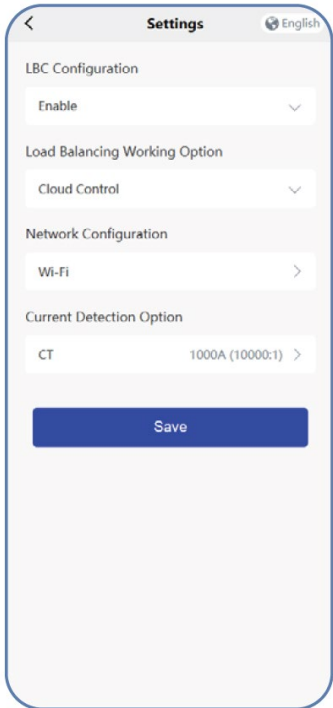
7.3. Network and settings configuration in AP mode

Log in

- Enable Wi-Fi on your smartphone.
- Power on the LBC to activate its Wi-Fi hotspot.
- Locate the LBC's Wi-Fi hotspot in your smartphone's list of Wi-Fi networks. The hotspot name corresponds to the LBC's serial number.
- Enter the password (found on the last page of the manual) to connect your smartphone to the LBC.
- Open a web browser and type 192.168.4.1 to access the AP mode login page. Then, log in using the PIN code provided in the manual.



Settings

LBC Configuration	Enable.	
Load balancing option enabled	Cloud Control	
Configuration	Wi-Fi, 4G or Ethernet.	
Current detection option	With smart meter: HAN/P1	
	Without a smart meter: CT	

 Note	The LBC operates using the cloud platform's algorithms; therefore, real-time adjustments and optimisations are managed directly by the cloud. To ensure optimal performance, ensure that the device is correctly connected to the platform.
	Once you have finished configuring the LBC, tap Confirm. The LBC will restart automatically and may take a few minutes to become operational again.

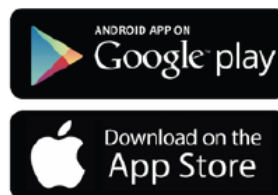
7.4. Settings in the app

Once the LBC is correctly connected to the platform via AP mode, the next step is to configure it via the mobile app.

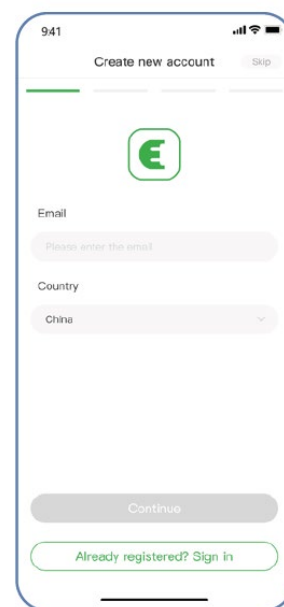
The app is primarily used to configure the building's load balancing parameters and manage the connection between the home and its electric vehicle chargers.

The main settings include the fuse rating, the contractual power limit, load balancing strategies and photovoltaic system settings, to ensure efficient energy distribution and optimal system performance.

1. Download the “Evcharge” app
 - a. Scan the QR code below.
 - b. Go to Google Play or the Apple App Store.



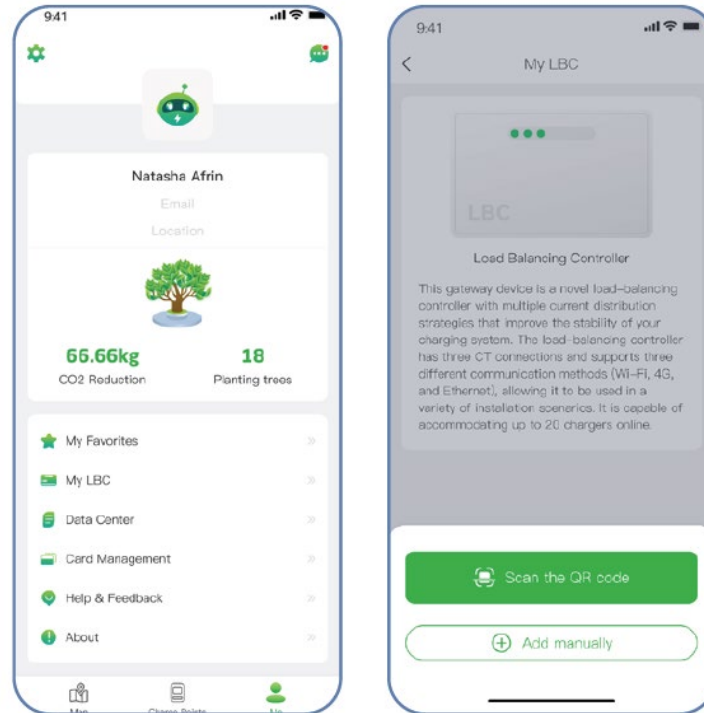
2. Create an account
 - a. Register using your personal email address and follow the on-screen instructions.
3. Log in
 - a. Log in to the app using your registered email address and password.



4. Linking your LBC to the app

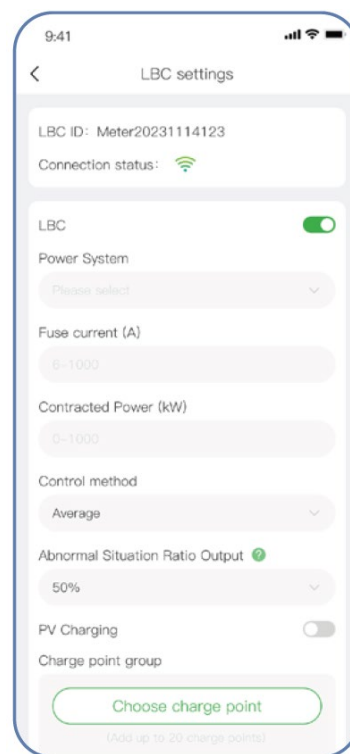


- Open the app and go to the 'Me' > 'My LBC' > 'Add a LBC' section.
- Scan the QR code on the LBC or manually enter its serial number to connect the device to the app.



Settings

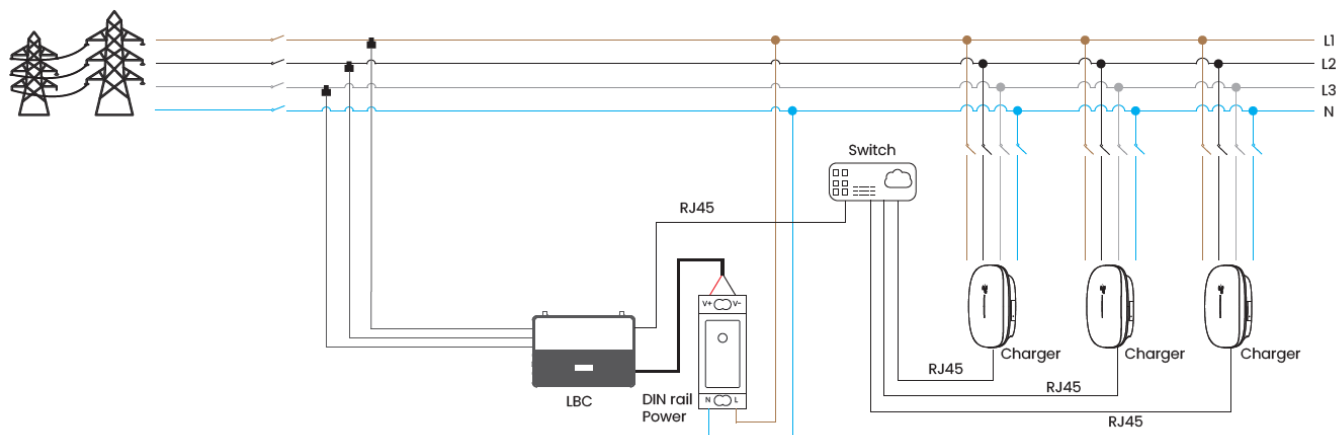
Enabling the LBC	Toggle the switch to enable the LBC and allow it to manage load distribution.
Power Supply	Select the appropriate power source for the charger.
Fuse rating	Enter the single-phase fuse rating for the domestic electrical installation.
Contractual power	Set the contracted power limit in accordance with the agreement entered into with the electricity network operator.
Control mode	Average mode: all electric vehicles receive an even distribution of charging power. Full Load mode: the first electric vehicle connected is given priority for charging at the maximum available power.
Output power percentage in the event of a fault	Set the default output power for chargers when the LBC is offline.
Photovoltaic (PV) Charging	If the building has a photovoltaic system, we recommend enabling this function to maximise the use of solar energy for charging electric vehicles.
	ECO mode: charging only begins when the excess photovoltaic current per phase exceeds 6 A, ensuring that charging is powered entirely by solar energy.
	MIX mode: charging begins when the excess photovoltaic current exceeds a user-set threshold; the mains supply makes up any shortfall, providing a combined power supply.
Grouping of Chargers	Connect the chargers and assign them to the LBC controller for load balancing management.



	If both the maximum fuse current and the contracted power are set, the LBC system will automatically adopt the lower value as the maximum operating limit.
	This ensures compliance with the maximum available power limit defined in the contract with the electricity network operator.
Note	

8. Local network control

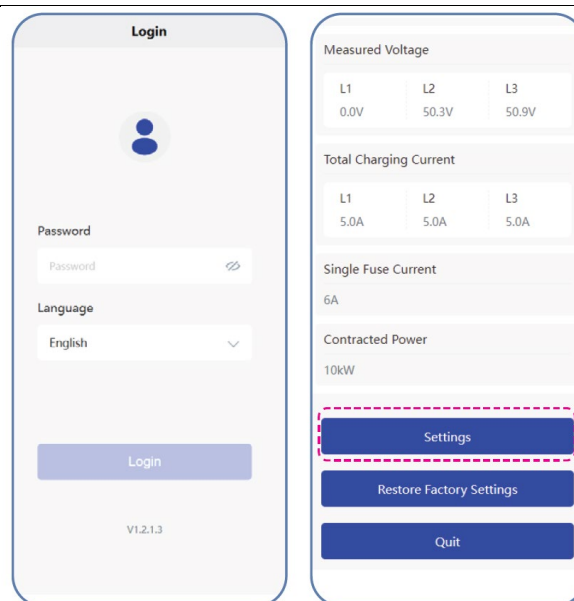
When cloud-based control is not available, for installations with multiple chargers, we recommend using local control to ensure load balancing through direct management, independent of the network connection.



8.1. Settings in AP mode

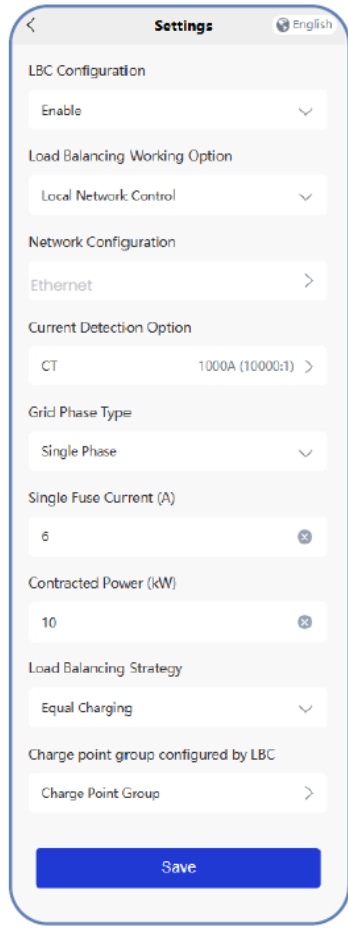
Log in

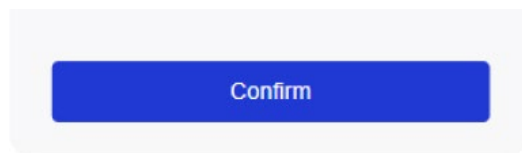
- Enable Wi-Fi on your smartphone.
- Power on the LBC to activate its Wi-Fi hotspot.
- Locate the LBC's Wi-Fi hotspot in the list of available Wi-Fi networks on your smartphone. The hotspot name corresponds to the LBC's serial number.
- Enter the password (found on the last page of the manual) to connect your smartphone to the LBC.
- Open a web browser and enter **192.168.4.1** to access the AP mode login page. Then log in using the PIN code provided in the manual.



Settings

Enabling the LBC	Enable	
Load Balancing Operating Mode	Select 'Local network control'.	
Network configuration	Ethernet	
Current detection mode	CT	

Mains phase type	Select the phase type according to the actual configuration of the installation.	
Single-phase fuse current	Set the rated fuse current for the electrical installation.	
Contractual power	Set the contracted power limit in accordance with the agreement entered into with the electricity network operator.	
Load balancing strategy	Equal Charging: all electric vehicles receive an equal distribution of charging power. Full Load mode: the first electric vehicle connected is given priority for charging at the maximum available power.	
Configuration of charging points managed by the LBC	Connect the chargers and assign them to the LBC for load balancing management.	



	Once the LBC configuration is complete, you must press 'Confirm'. The LBC will restart automatically and may take a few minutes to come back online.
	The PV Charging function is not currently supported in local control mode.

Note

9. Wiring instructions

Scan the QR code below for further information on wiring details, such as cable type, cable length and other technical parameters.

Port	Cable type	Connection from the LBC to the Meter/Network	Notes
P1	RJ12 	<5m	/
HAN	RJ45 (Cat 5 or higher)	<5m	/
ETHERNET	RJ45 (Cat 5 or higher)	<5m	/
CT	-	<15m	Red - White +

10. Technical specifications

Model	EN-Meter-02-40
Power supply	230 V AC 1P+N+PE; 400 V AC 3P+N+PE; 5 V DC
Rated current	0.35 A/0.2 A/2 A
Rated power	2 W
Frequency	50 Hz
Power measurement accuracy	Built-in meter with an accuracy of $\pm 2\%$ at normal input
Antenna type	Wi-Fi/4G
Supported ports	HAN, P1, RS485, CT
Communication	Wi-Fi, 4G, Ethernet
Operating humidity	5%–95%
Operating temperature	-20 °C to +50 °C

11. Miscellaneous

11.1. Storage and transport

Transport the chargers in their original packaging.

Do not place any objects on top of the LBC.

Before transport, store the product in a clean, dry and well-ventilated place, with relative humidity not exceeding 80% and free from corrosive gases.

The environmental conditions for storage and transport must not exceed those specified in the technical specifications.

11.2. Dismantling

Only authorised and qualified electricians may dismantle the product.

Switch off the LBC before dismantling and proceed in the reverse order to that of installation.

11.3. Disposal / Recycling

The product must be taken to collection points for electronic equipment and disposed of correctly in accordance with environmental regulations and local standards. Electronic devices must not be disposed of as household waste.

Zucchetti Centro Sistemi S.p.A. is not responsible for the disposal of the equipment, or any parts thereof, that does not comply with the regulations and standards in force in the country of installation.



The crossed-out wheeled bin symbol indicates that the equipment, at the end of its useful life, must be disposed of separately from household waste.

This product must be taken to your local authority's waste collection point for recycling.

For further information, contact your local waste collection authority.

Inappropriate waste disposal may have a negative impact on the environment and human health due to potentially hazardous substances.

By helping to ensure this product is disposed of correctly, you are contributing to its reuse, recycling and recovery, and to the protection of the environment.

12. Warranty Terms and Conditions

To view the warranty terms and conditions offered by ZCS Azzurro, please refer to the documentation included in the product packaging and the website www.zcsazzurro.com.



AZZURRO

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