ELECTRIC VEHICLE CHARGER

INSTALLATION GUIDE

ICS7D, ICS22D, ICS7E, ICS22E



Scan below for technical support, FAQs, Help.

Scan the below QR code to download the **Charger Documents**

& **Latest Firmware** updates

www.intelligentchargingsystems.co.uk

Rev01

IMPORTANT !

Read this entire document before installing or using the charger.

Failure to follow any of the instructions and warnings in this document can result in fire, electrical shock, serious injury or death.

The Charger must be installed by a qualified electrician who is familiar with the latest applicable standards and guides.

The entire installation must comply with the latest BS7671 Regulations.

Incorrect installation and testing of the charger could potentially damage either the vehicle's Battery and/or the charger itself. Any resulting damage is excluded from the warranty for both the vehicle and the charger.

Turn off input power at the circuit breaker before installing or maintaining.

Do not use this charger if the EV charging cable is frayed, has broken insulation, or displays any other indication of damage.

Do not use this charger if the enclosure or the EV charging connector is broken.

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PRODUCT OVERVIEW



No.	Item
1	RGB LED indicator, which shows charging status.
2	RFID reader (ISO/IEC 14443)
3	Physical button
4	Type-2 socket for EV Charging

ICS7D / ICS22D & ICS7E / ICS22E

The iCS ICS7D/22D is a domestic /commercial charger that has integral RFID reader and can be connected to the internet via Wi-Fi or WLAN.

The iCS ICS7E/22E is a domestic / commercial charger that has integral RFID reader and can be connected to the internet via Wi-Fi, WLAN or SIM Card. The charger can also be configured for Auto charge and plug in charge as per ISO15118 (dependent on the vehicle security certificate). Compatible backend platform software connection may be required for plug and charge feature,

PME EARTH FAULT MONITORING

If installed on a TN-C-S (PME) system, a dedicated earth rod to the charge point may not be required, as our hardware meets the requirements of the revised regulation 722.411.4.1 (v) for use of an open protective earthed-neutral (PEN) detection device. Upon detection of a fault, charging is stopped and the car isolated from the supply (including earth).

RCD Requirements

Dependent upon the type of cable used and if mechanical protection is present the charger may require to be further protected by an external Residual Current Device (RCD) to be installed in the upstream circuit which complies with the following:

- Type-A
- Complies with one of the following standards: IEC61008-1, IEC61009-1, IEV60947-2 or IEC62423

Please note, integrated onboard RCD protection to IEC60947-2 is included within the charger, the integrated RCD protection is a Type A with 6mA RDC-DD.

Model	ICS7D	ICS7E	ICS22D	ICS22E
Current and Power	Maximum 32A and 7kW		Maximum 32A and 22kW	
Voltage and Wiring	230V AC single-phase		400V AC three-phase	
Frequency	50-60 Hz			
Internal RCD	AC 30mA, DC 6mA			
User Authentication	RFID reader (ISO/IEC 14443)			
Data Protocol	OCPP 1.6J			
ISO15118	N/A	Support	N/A	Support
Charging Connector	IEC62196 Type-2 socket			
Buttons	1 x Physical Button			
Network Connectivity	Ethernet, LAN, Bluetooth			
4G	N/A	Supported	N/A	Supported
Working Temperature	-30°C to 50°C			
Storage Temperature	-40°C to 70°C			
Working Humidity	5% - 95% without condensation			
Enclosure Dimensions	280 x 208 x 128 mm			
Shipping Weight	2.72 Kg			
P Rating	IP55			
Certification	EN61851-1, EN61851-21-2, EN61008-1, EN62955			

OVERVIEW OF STEPS

iCS have developed our chargers to be easy to install and require minimum setup on site. This instruction manual will guide you through the installation steps which are as follows;

Step 1: Check the box contents

Step 2: Wall mounting and wiring

Step 3: Access the configuration page

Step 4: Setup Wizard

Step 5: Optional CT clamp setup (CT clamp not supplied)

Scan the below QR code to download the

Charger Documents & Latest Firmware updates

STEP 1—CHECK THE BOX CONTENTS

Check the box contents, if any components are damaged or missing please contact iCS.



EV Charger



Opening Tool (front cover)



Terminal crimps x 2



Terminal crimps x 3

NOTE: Supplied RFID Cards

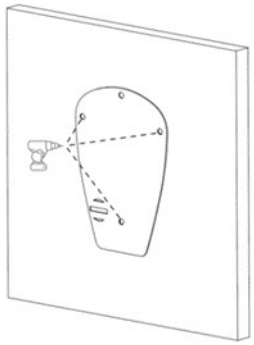
The supplied RFID cards are preprogrammed to work with the charger for offline use.

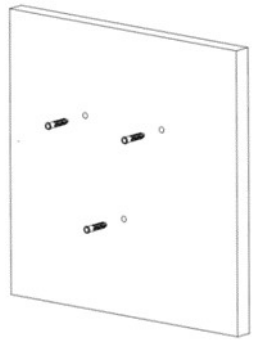
When the charger is connected to any backend software platform including the iCS2.0Lite APP, the RFID cards will be automatically deleted from the chargers internal memory.

Dependent on the backend software platform the charger is connected to will be dependent if you can add/ program the RFID cards or you may need to purchase cards.

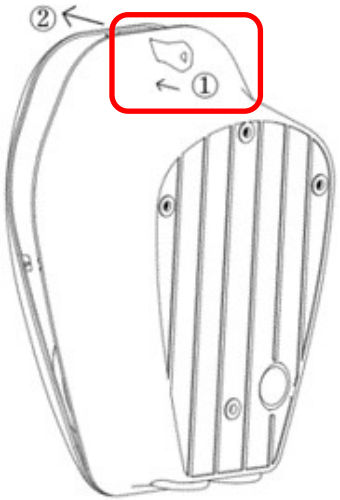
STEP 2—WALL MOUNTING & WIRING

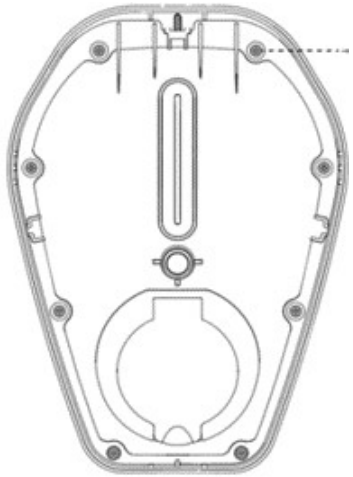
2.1. Using the included template, mark the mounting holes required, drill the holes to the required depth.





2.2. Use the opening tool to remove the shiny front cover, then unscrew the second grey cover, and mount to the wall using the supplied screws.





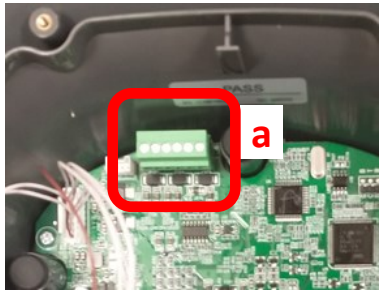
2.3—Wiring the charge point

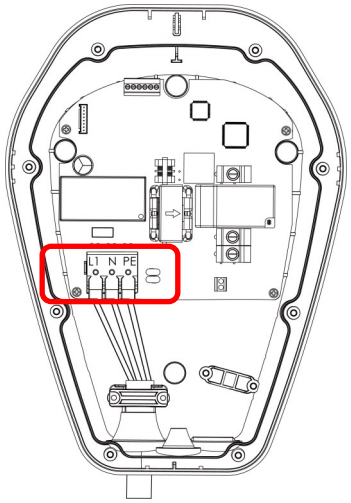
The AC connections are shown in the illustration below.

The terminals should not be over tightened as this may damage the back plate. The recommended torque setting for the electrical terminals is 1.2Nm.

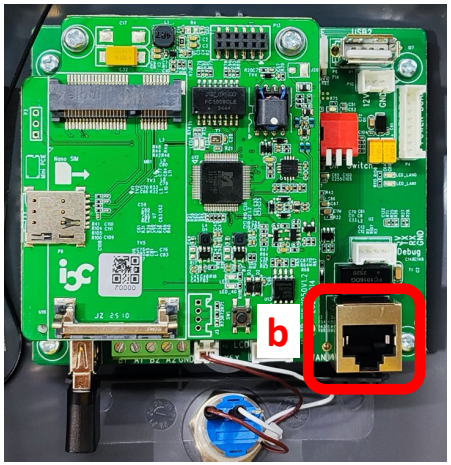
Before powering on, please ensure that the front cover is screwed back on (**do not use an impact driver for the front cover screws or terminal screws**). If the charger is powered on without the front cover in place then the charge point will show a fault status due to the tamper protection integrated within the charge point.

If you are connecting CT clamps, please use the below green terminals circled in red (a), refer to page 22-28.





If you wish to hard wire the internet connection using a Cat5e/6e cable via the RJ45 connector on the rear of the front cover, circled in red (b),



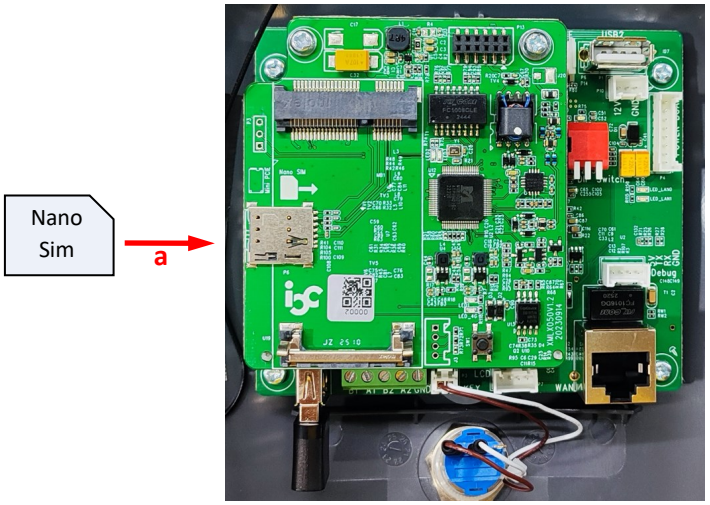
2.4— SIM Card

If you wish to use a SIM card, ensure the AC supply is turned off.

Remove the lid of the charger.

The SIM Card slot is on the lid PCB. Insert the Sim Card in the connector ensuring the correct orientation as below in red (a).

Before powering on, please ensure that the lid of the charger is secured.



Step 3— CHOOSE A SERVER CONFIGURATION PLATFORM

The server page of the setup wizard, sets up the OCPP configuration of the charge point. This comes defaulted to *iCS2.0 Lite* (free iCS app).

This page directs the charger to communicate with the customer's preferred software provider or you could select the charger to be Offline.

The charger has a number of preconfigured selectable server modes of operation.

You are not restricted to just these pre-configured options, You can enter the required details of the preferred software provider (*refer to page 16*).

Please liaise with the customer for their preference for the software/server connection setting.

This setting can be altered at a later date if required.

The pre-configured settings that can be selected from the "Server Connection" from the drop down selection box are;

1.Offline Mode

2. User Defined

3.iCS2.0Lite APP (Free)

4.Fuuse Platform (4G Sim Card) Subscription (Annual Fees)

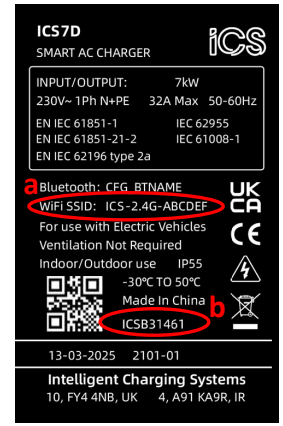
5.Fuuse Platform (Wi-Fi/LAN) Subscription (Annual Fees)

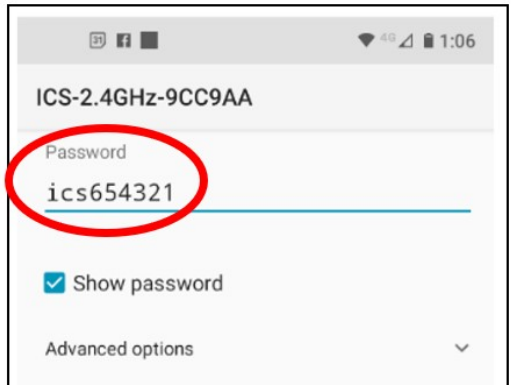
PLEASE NOTE: For the charger to be fully operational and online, an agreement with your chosen software platform backend service provider must be in place.
Depending on the software provider, this may require subscription registration forms and possibly a payment to be completed prior.

Only the offline and iCS2.0Lite configuration settings will not require any subscription forms to be completed.

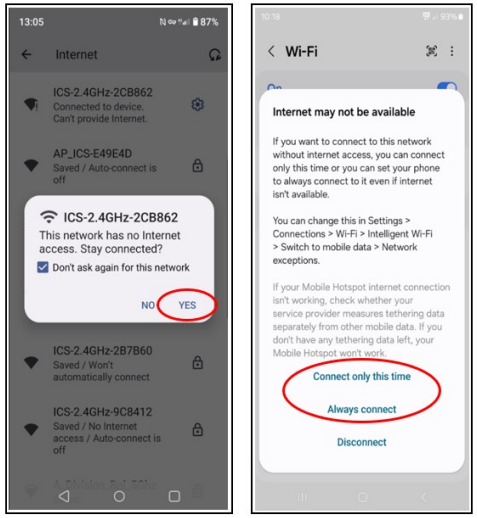
STEP 3 —Access The Configuration Page

- Connect your device (Phone, Tablet or Laptop) to the chargers Wi-Fi. You will see the charger produces it's own Wi-Fi network (AP_ICS-*******) This information can be found on the sticker on the side of the unit (a),
- Connect to this network using the default password which is "ics654321" (c),





- Your phone may show the below pop up notification, select always connect.

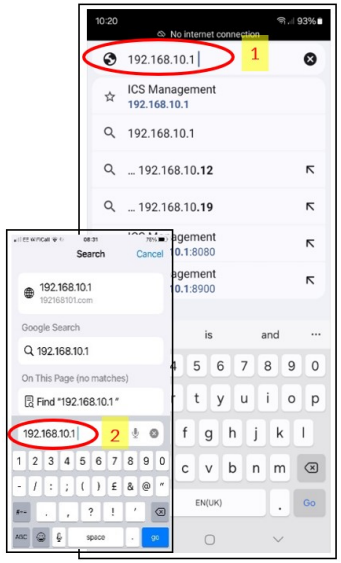


Ensure your mobile device is always connected to the chargers 'AP_ICS-XXXXX' Wi-Fi.

Please ensure you are in close proximity to the charger while setting up.

On your mobile device, Open a web browser (Android Google Chrome) or (iPhone Safari) And enter the below in the address bar

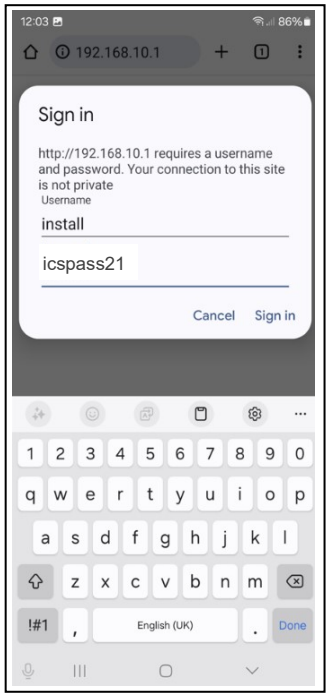
192.168.10.1 **(or)** 192.168.10.1:8081



Note:

Android: Enter IP Address at the top (1)

iPhone: Enter IP Address at the bottom in Safari (2)



Default:

USERNAME: install

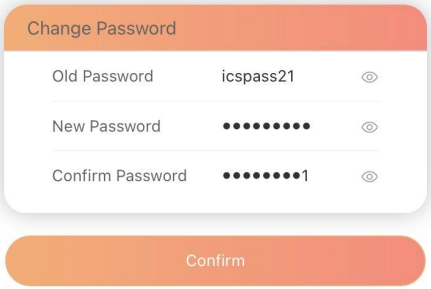
PASSWORD: icspass21

ACCESSING CONFIGURATION

ACCESSING CONFIGURATION

STEP 3 —Access The Configuration Page

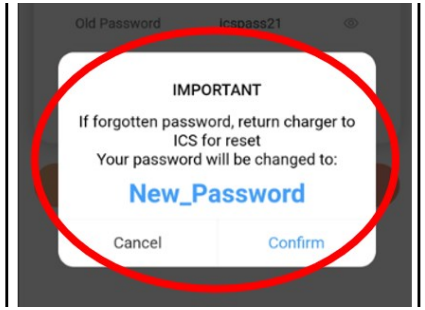
- It will then prompt you to change the password



If this password has been forgotten, then there is no way of resetting the password as per UK Cyber Security Regulations.

In the event the password has been forgotten or lost then the charger will need to be returned to iCS.

So please change it to something memorable and if necessary make a note or take a screenshot of the password displayed.



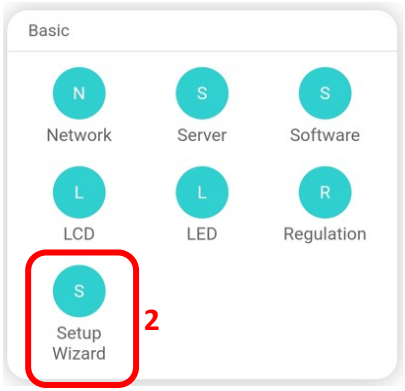
- Once confirmed, it will ask you to log back in again using the newly created password.

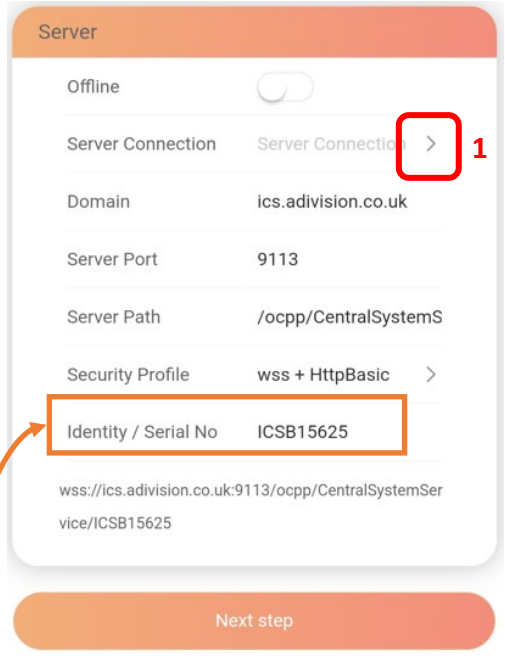
STEP 4— Setup Wizard

4.1 Server Setup

The server page of the setup wizard sets up the OCPP configuration of the charge point—this comes defaulted to ICS2.0 Lite—the free iCS app. However, if this requires changing then it's a simple process of filling out the information or selecting the "Server Connection" circled below in red (1).

If the **setup Wizard does not start automatically**, please select the icon below marked as "Setup Wizard" circled in red (2) below.





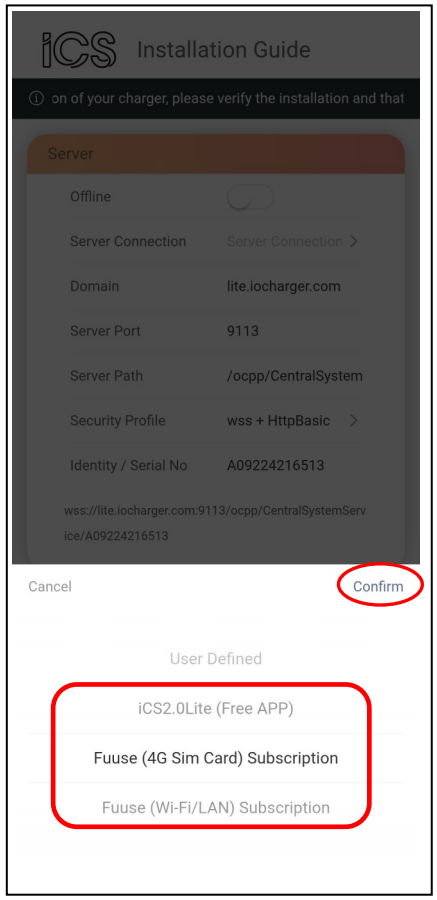
This should be the serial number of the charger, located on the sticker on the side of the charger circled in ***red (b) page 10****.*
If different please adjust.

4.1 Server Connection Setup

Server Connections options are;

- ICS2.0LIte (Free APP) Default
- Fuuse Platform (4G Sim Card) Subscription: Software Connection via Sim cards (Mobius) provided by Fuuse
- Fuuse Platform (Wi-Fi Lan) Subscription — Software Connection via Wi-Fi, LAN or other 4G SIM Card Provider

This server setting can be altered at a later date if required.



- Once selected, click "*Confirm*"

If you are not using any of the pre-configured "*Server Connections*".

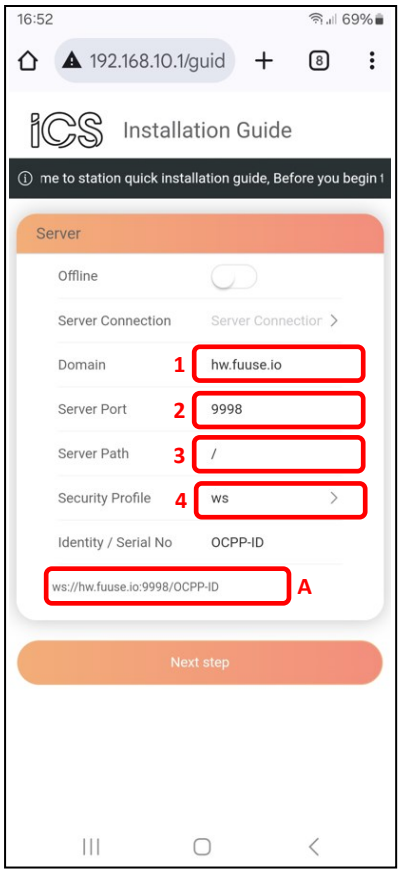
Your software provider will provide you with the required URL settings.

You will need to manually fill the below boxes to match the specific "*Reference URL*" (A) to what you have been provided.

- Domain (1)
- Port (2)
- Path (3)
- Security Profile (4)

Please see below as an example (A)

Required URL: ws://hw.fuuse.io:998/OCPP-ID/serial number



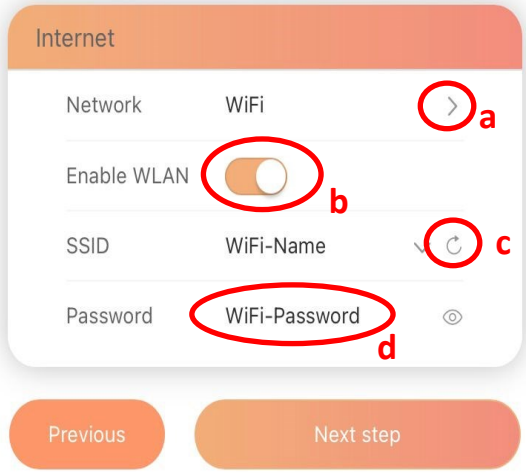
4.2 Network Setup

The next page is used to set up the network. This is commonly done via Wi-Fi,

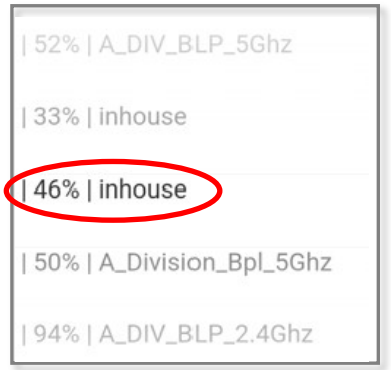
To change the type of connection to either 4G or LAN select (a)

For **Wi-Fi connection** ensure the "**Enable WLAN**" is enabled as shown below (b)

To scan for the surrounding Wi-fi networks, select (c). After a short period of time the display will populate with a list of Wi-Fi networks visible to the charge point, Select the customer's Wi-Fi network and then type in their Wi-Fi password (d).



Please note: the percentage next to the Wi-Fi network name denotes the signal strength, please ensure this is above *40%*. Lower than this may have connection issues and a Wi-Fi extender or hard wired connection maybe required.

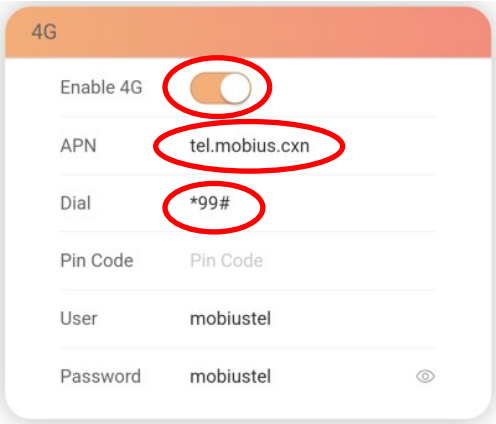


Note: Please refrain from changing the "AP Password" unless you have it recorded for future reference..

If you have selected 4G.

Please ensure the "**Enable 4G**" is enabled and the "**APN**" and "**Dial**" have been completed as per your Sim card Provider required details.

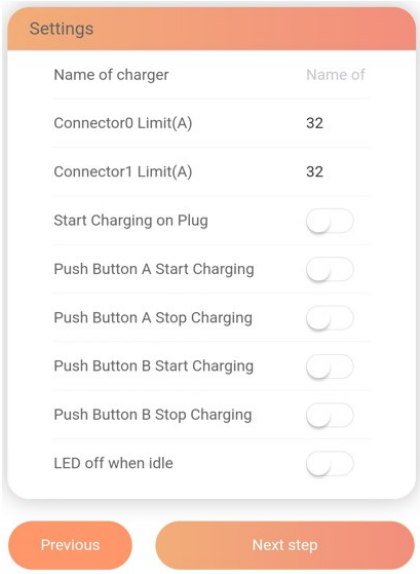
Below example



4.3 Software Options

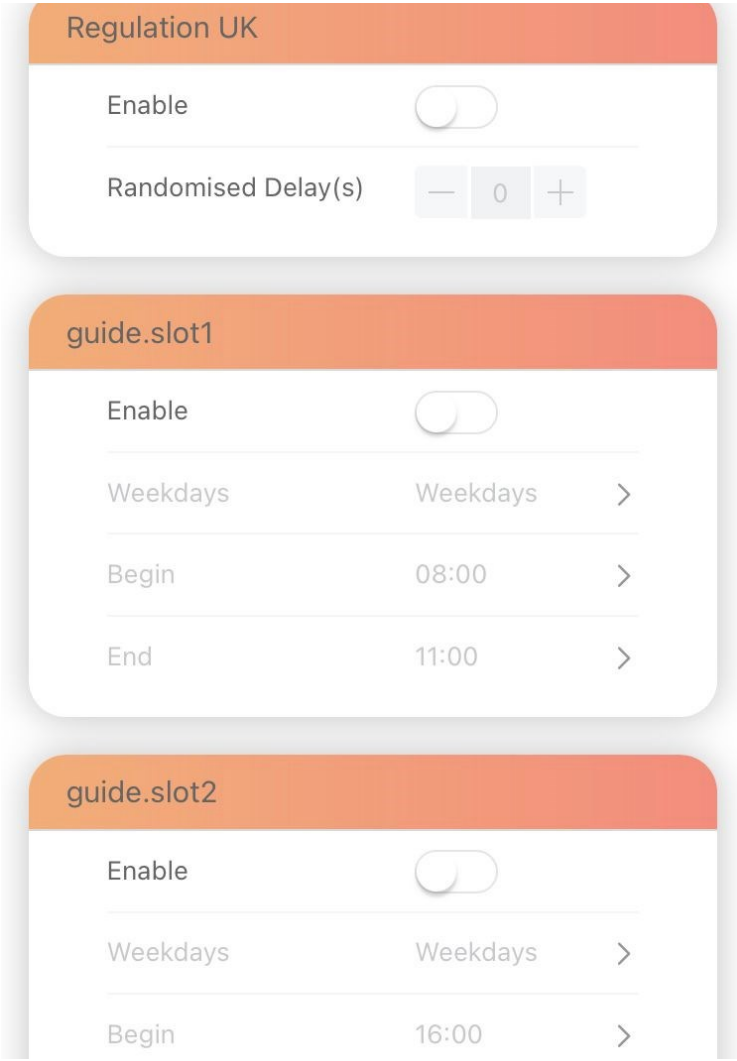
This section give you / customers various options of configuration, such as you can limit the current offered to the vehicle, start on plug or push button.

PLEASE NOTE: The options for "Start Charge on Plug" and "Push Button Start Charging" are not suitable for the "**Full Subscription Software**" and should be left disabled.



4.4 Regulation Setup

In the regulations tab there is the option to enable or disable the optional UK Smart Charging Regulations, this option limits the charge points use between certain times.



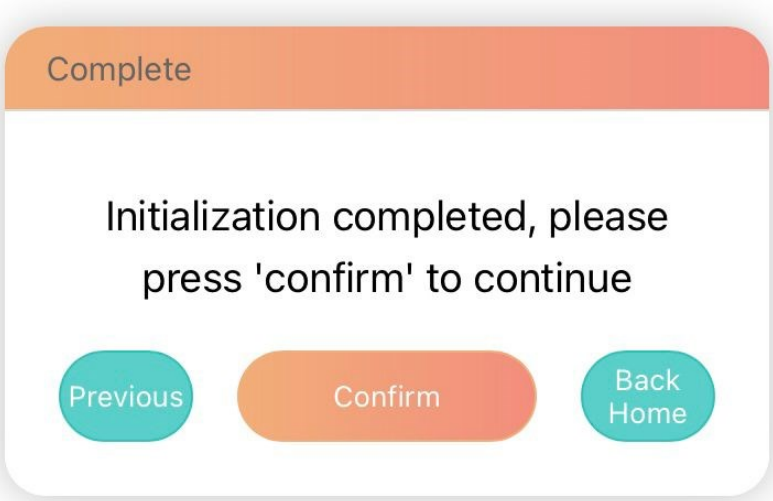
4.5 Confirmation Page

Now the configuration has been completed, you need to confirm the settings and then reboot the charger when prompted.

Once rebooted the charge point can then be connected to the free iCS2.0 lite app by scanning the QR code or entering the serial number located on the side of the charge point.

Please Complete the Records Section of the User Guide for future reference.

For more help on the app, look at the included User Quick Start Guide.



LOAD MANAGEMENT : Optional

The iCS ICS7D/22D and ICS7E/22E has the facility to connect a CT clamp/s for load management directly to the charger.

This ideally suited if the charger is connected to the iCS2.0Lite APP platform.

If a separate load management Hub (ICSLMPS) is used then this system will only work when the hub and charger are on the same network, and will NOT work when SIM cards are used.

Consideration will need to given if you wish to use Fuuse, Monta, GreenFlux or any other backend platform when requiring load management

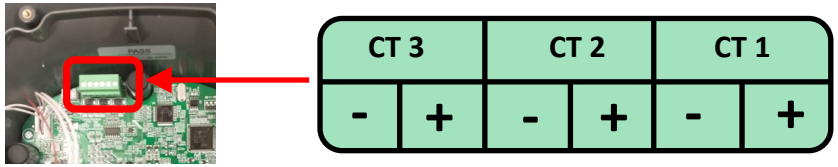
We would strongly recommend that you liaise with the platform provider for guidance, as they may have their preferred load management equipment/options, either via hardware of software controlled via their platform.

When using other software platform providers, in essence the iCS load management connection on the following pages theoretically may work, but it will be difficult to manage/inspect and monitor the load management. iCS will only be able to support load management when connected to the iCS2.0Lite APP.

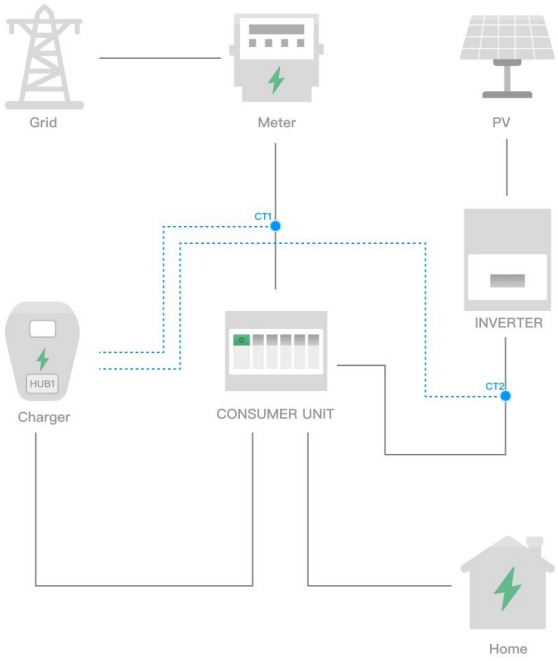
STEP 5: Optional — (CT clamp not supplied)

CT Clamp Setup when connected to iCS2.0Lite APP

The ICSH7D has the ability to dynamically control the charger based on the electrical load of the property. It can also be used to divert excess solar power to the car. An optional ICSCT can be purchased and connected to the terminals shown below.



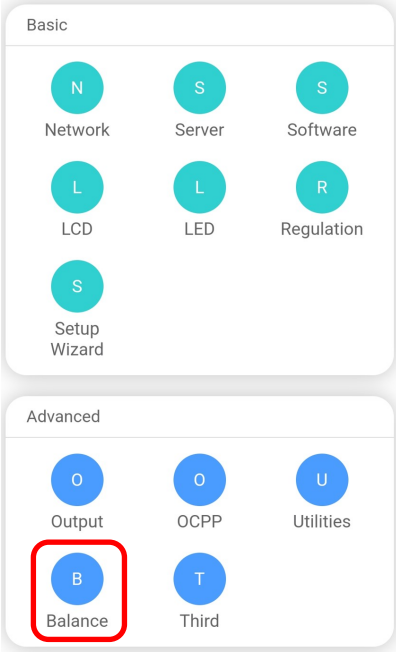
If a CT clamp is required to monitor the household load then 1 CT clamp is required. If solar is present in the property then it's recommended to fit 2 CT clamps as shown in the diagram below.



5.1 CT Clamp Setup (CT clamp not supplied)

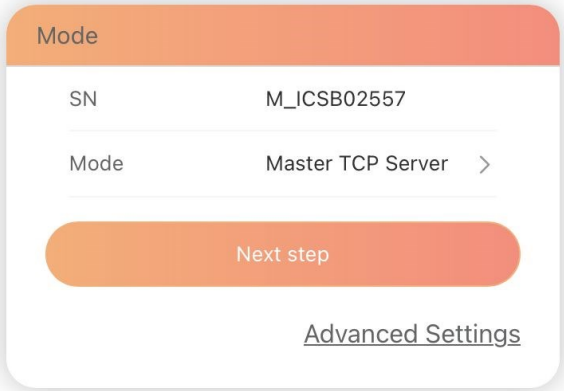
First, log back into the configuration page instructed in Step 3 (page 10).

If you have already changed your password there should be no need to change again. Once logged in, select the 'Balance' Icon under the advanced tab.



Then select the mode as Master TCP Server, as shown below. Then click Next Step. Ensure the "SN" is the serial number of chargers prefix with "M_"

i.e. charger ICSB00001 SN: should be "M_ICSB00001"

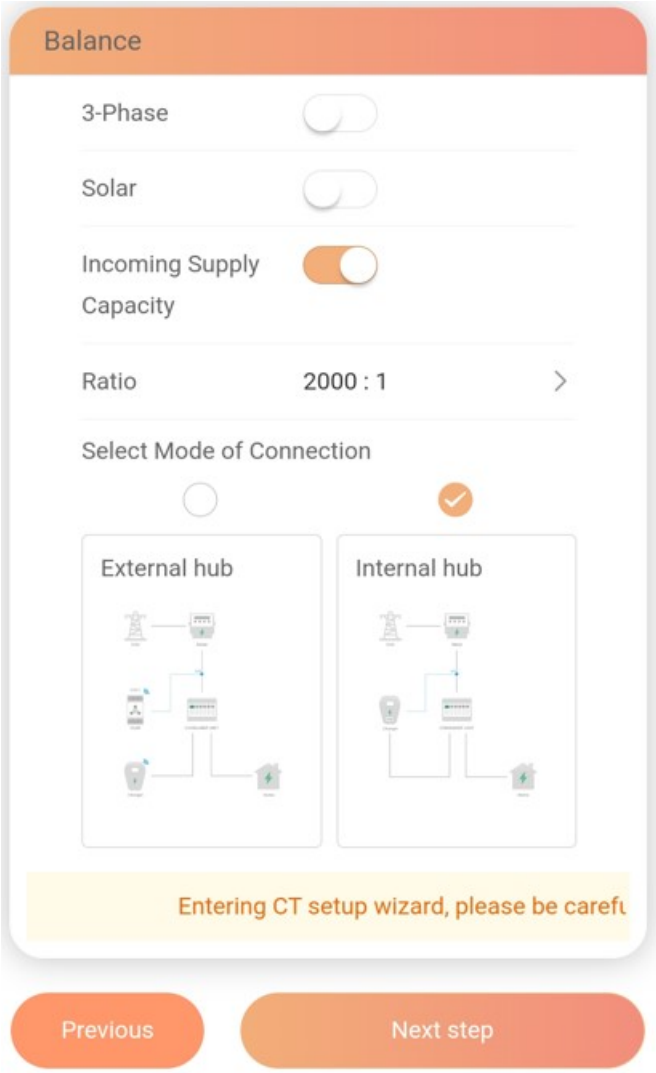


5.2 CT Clamp Configuration

On this page, you can select whether or not solar is connected to the property.

The GRID CT should be connected to the CT1 input (page 23)

The SOLAR CT should be connected to the CT2 input (page 23)



5.3 Grid Current Setting

On this page the current setting is set up:

Rated Current: This is the current rating of the main incoming fuse, this is in 0.1A, so for a 100A fuse you would input 1000, as shown below.

Safe Current: This is a safety buffer of when you want to limit the charge current, For instance the below is set to 20A, this means once the properties current reaches 80A, the charge rate will start to reduce.

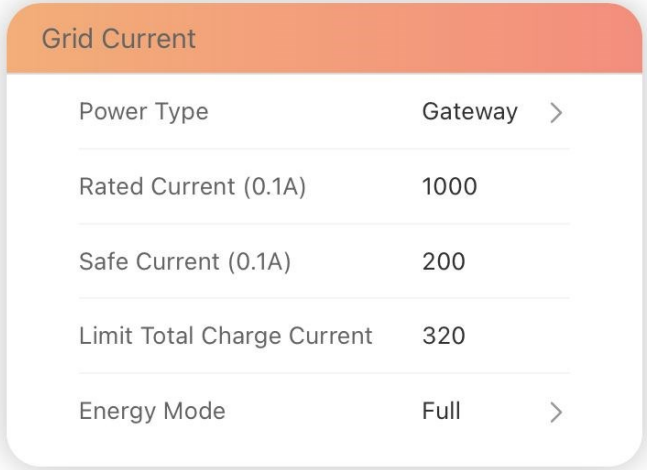
Limit Total Charge Current: This is used if multiple charge points are connected and it limits the group of charge points to a set limit.

Energy Mode: This is used if the charge point is required to only charge from solar, this setting can be changed in the app.

Solar—Use's only the excess solar power to charge the car—If the solar drops below the minimum charge rate, the charger will suspend the charge session until the solar generation increases.

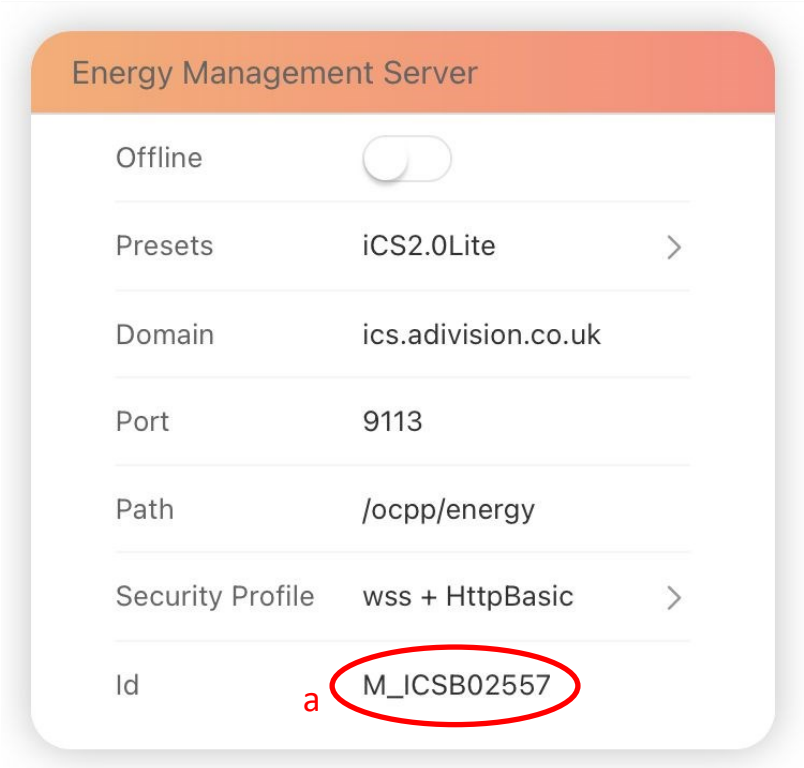
Solar Assist—Use's the excess solar power to charge the car, but will continue charging using power from the grid if the solar drops below the minimum charge rate.

Full—Charges the car at 32A or the maximum current the car can charge at..



5.4 Energy Server Setup

If the customer wishes to view the information of the CT clamps then the internal load management hub can be connected to the app. This can be added to the app by adding the ID—this is usually M_ and then the serial number of the charge point. As demonstrated below (a).



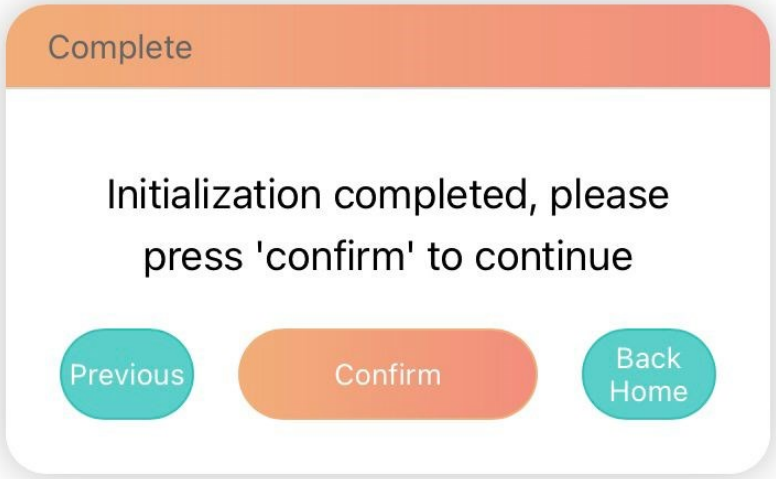
5.5 Confirmation Page

Now the configuration has been completed, you need to confirm the settings and then reboot the charger when prompted.

Once rebooted the charge point can then be connected to the free iCS2.0 lite app by scanning the QR code or entering the serial number located on the side of the charge point.

Please Complete the Records Section of the User Guide for future reference.

For more help on the app, look at the included User Quick Start Guide.



iCS2.0 Lite: DOWNLOAD THE APP (free)

By selecting one of our charge points, your client gains access to the complimentary iCS2.0 Lite application.

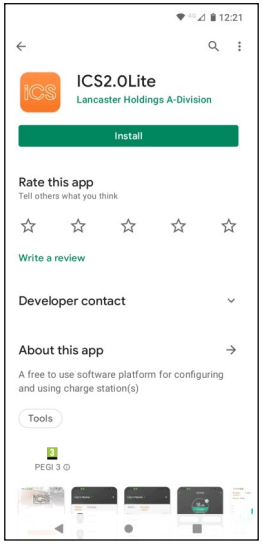
Some installer have the APP installed on their mobile device so they can connect the charger to their account. This enables you to update firmware and ensure correct functionality before removing the charger from your account (page25 (a)) so the client can then add to their account.

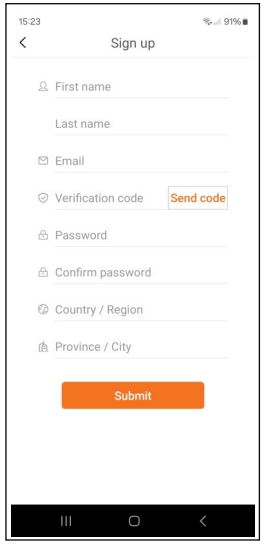
Simply scan the QR Code provided below to access the app from the appropriate source.

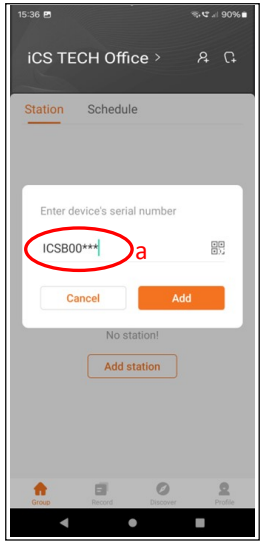
Google Play Store

Apple App Store

- Register an Account, Enter email address and then click “Send Code”, a code will be sent to your email address for verification.
- Once signed in to the APP enter the EV Charger Serial number (a).



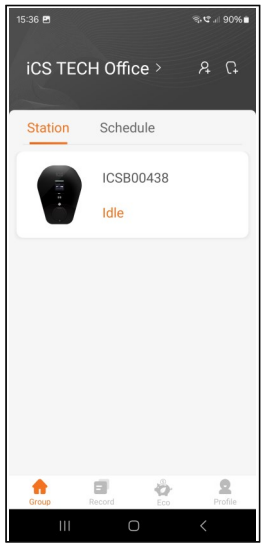


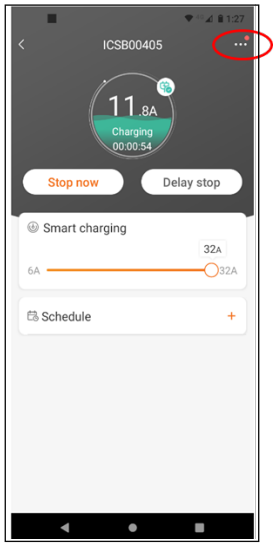


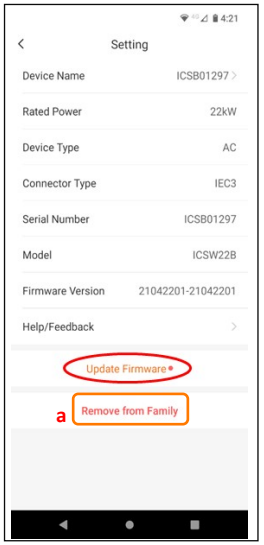
iCS2.0 Lite APP

For more APP instructions please click here or scan QR code

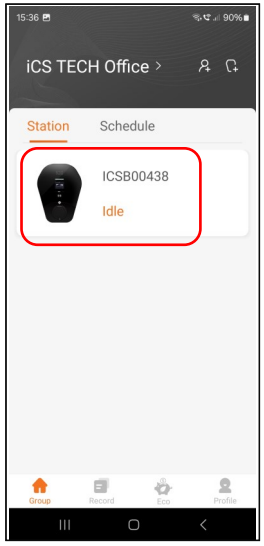
- You can update the firmware

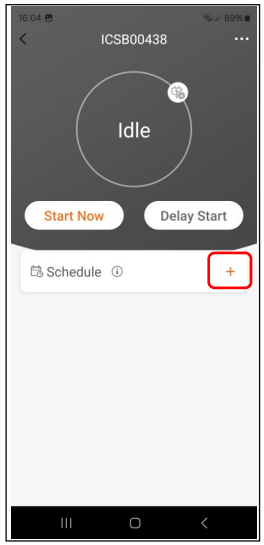


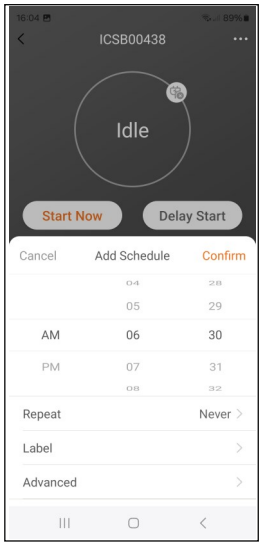




- You can also setup schedules







TROUBLE SHOOTING

Situation	Action
If the charger has no or intermittent Wi-Fi hotspot	Check the internal USB dongle is securely fitted on the lid of the charger
	Move the internal USB dongle to a spare USB port
	Use a long Ethernet cable to temporarily connect the charger to router for easy firmware update
Status indicator is not blue after the charger is powered on	Make sure the AC power input is connected correctly and is switched on.
	Ensure the base board and Lid PCB ribbon connector is connected correctly and secure
	Check to the see if the LED colour has been turned off (black)
 Red light is flashing	UK Regulations is Enabled and Active
 Flashing Green	Suspended EV Charge
 Red and Blue flashing alternately	PME Fault (ground fault) - Hold silver button for 12 Seconds—if persist Contact iCS
Red light is solid	CP/CC fault—Ensure plug cable and socket pins are not corroded

MAINTENANCE AND REPAIR

Regularly inspect the charger components for damage. If damage is found do not use and contact iCS.

If the unit is not operating correctly, contact iCS.

Wipe the outside of the charger regularly with a clean slightly damp cloth to remove any accumulation of dust and dirt. Do not use cleaning solvents to clean any of the charger's components.

Regularly conduct a visual inspection of the unit.

ENVIRONMENT:

Please do not dispose the packaging as unsorted waste, use the recycling facilities provided by your local authorities.

When the charger or associated components comes to the end of its life or you choose to update or upgrade by replacing it, then do not dispose with your normal household waste. Please recycle where facilities exist. When you need to dispose, check with your retailer or local authority for suitable options.

Due to our policy of continuous improvement we reserve the right to change specification without prior notice. Errors and omissions excepted.

These instructions have been carefully checked prior to publication. However, no responsibility can be accepted by Intelligent Charging Systems (iCS) for any misinterpretation of these instructions.

INSTALLATION RECORDS

Please also Complete the records in the user manual

Charger Serial Number:: .....

Internet Connection: Wi-Fi ☐ Ethernet ☐

Server Connection: Offline ☐ Lite APP ☐ Subscription ☐

Access Point Password: .....

SSID Wi-Fi Connected to: .....

Current A: .....

Load Balancing: .....

Load Balancing SN: M_ICSB .....

UK Regulations Enabled: .....

Scan the below QR code to download the

Charger Documents & Latest Firmware updates

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