INSTALLATION & MAINTENANCE

FOR SMART ION CHARGE ELECTRIC VEHICLE CHARGER

MODELS NUMBERS - EV03221000 & EV03221010

PLEASE READ IN FULL BEFORE INSTALLING ANY PRODUCTS

Contact Us
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NOTES

Please read all instructions before installing and using this product. Store in a safe place for reference.

The EV charger should be installed, commissioned, and maintained by or under the supervision of a competent electrician in accordance with current electrical engineering codes of practice, requirements for electrical installations (BS7671), statutory requirements and any specific instruction issued by the company.

Damage to the equipment, connected systems or to property caused by improper installation are the responsibility of the installer.

WARNINGS

Warning: Do not install or use the EV charger near flammable, explosive, harsh, or combustible materials, chemicals, or vapours.

Warning: Turn off the power at the circuit breaker before installing.

Warning: The EV charger must be grounded through a permanent wiring system.

Warning: Use the EV charger only within the specified operating parameters.

Warning: Never spray water or any other liquid directly at the EV charger, or IONsens.

Warning: Never submerge the EV charger, charge plug or IONsens in liquid.

Warning: Store the charge plug (EV03221010) in the dock station to prevent unnecessary exposure to contamination or moisture.

Warning: Do not use the EV charger plug if it is defective, appears cracked, frayed, broken, or otherwise damaged.

Warning: The EV charger plug and IONsens is not user serviceable. Do not attempt to disassemble, repair, tamper with, or modify. Contact Craig & Derricott to report any damage or faults.

Warning: Do not touch the EV charger plug terminals with fingers or sharp metallic objects, such as wire, tools, or needles.

Warning: Do not insert fingers or foreign objects into any part of the EV charger socket.

Warning: Use of the EV charger may affect or impair the operation of any medical or implantable electronic devices, such as a cardiac pacemaker or an implantable cardioverter defibrillator. Check with your electronic device manufacturer concerning the effects that charging may have on such electronic devices before using the EV charger.

CAUTIONS

Caution: Do not use private power generators as a power source for charging.

Caution: Incorrect installation and testing of the EV charger could potentially damage the vehicle's battery, components, and/or the EV charger itself.

Caution: Do not operate the EV charger or IONsens in temperatures outside its operating range -30°C to +50°C.

Caution: Do not use any adaptors or cable extension cords with this EV charge unit.

This OCCP compliant EV charger is an easy to install unit for residential locations. It offers 7.4kW single phase fast charging: plug and charge via the ION charge App, or RFID operation.

This EV charger is equipped with PME fault detection with no requirement for an earth rod. The unit also supports dynamic load balancing / management and solar charging via the IONsens device, that is included with your EV charger.

PRODUCT SPECIFICATION – ION EV CHARGER	
Power supply input	Nominal 230V AC single-phase
AC output current	32A
Mode 3 Fast Charge	7.4kW
Mains Cable Terminals	10mm^2
Car Cable Charger Connection	UK type 2
Frequency	50/60 Hz
Tethered Cable Length	5 metres
Independent back plate	For easy wall installation
Product Size (mm)	351.5 x 280.5 x 140
Weight	3.1Kg (Socketed)- 5.2Kg (Tethered)
Operating Temperature (Indoor or outdoor)	-30°c to +50°c
Storage Temperature	-40°c to +85°c
Enclosure IP Rating	IP55
Connectivity	Integrated RFID reader for offline stop / start charging. 2.4Ghz WiFi, Bluetooth V4.2 and Ethernet connectivity. Smart App for communication
Security	Anti- tamper device fitted to main cover with alert notification
Electrical Safety	Built in overcurrent and 6mA DC residual current detection. **Instruction:** A type A RCD/RCBO must be fitted and placed upstream of the EV charger.
	PME fault detection (no earth rod required)

PRODUCT SPECIFICATION – IONSENS (inclusive of current transformer) for dynamic load balancing	
IONsens Product Size (mm)	116 x 63 x 28 (not including CT)
Weight	20g (IONsens),
Operating Temperature (Indoor or outdoor)	-30°c to +50°c
Storage Temperature	-40°c to +85°c

SUMMARY

The United Kingdom introduced regulations that applies to domestic and private EV charge points. The regulations are designed to balance demands for power and to deliver an efficient use of power across the country whilst maintaining a consistent and secure service to EV drivers.

Summary of smart capabilities (correct at time of print).

- Connected to a charging application that can control your EV charger.
- Has the ability to receive remote, online software updates.
- Capable of measuring the power used and the power delivered, and the associated time periods.
- Capable of storing and displaying data about charge sessions.
- Capable of communication with the power supplier and able to adjust the delivery of power in response to commands issued by the supplier. (This requires software integration with chosen supplier. Please contact Craig & Derricott for more information).
- Capable of charging even in the event of communications with the network being lost.
- Data recorded about the charge session will be communicated at the next available opportunity when online.
- The ability to receive power from any electricity supplier. Incorporates off-peak charging as the default with the ability to override if required.
- Randomised delay between initiating a charge session and the charge session starting. This is to prevent overload of the electricity system if too many charge points are activated the moment the off-peak period starts.
- Physical and digital protection of data and of the components used to access that data.
- Physical protection of electrical components within the charge point to prevent personal harm and to prevent accidental or malicious tampering.
- Regulations are continuously under review which may bring additional requirements in the future.

Load Balancing / Management device explained.

Load balancing capability is designed to prevent overloads of the property's power supply when a vehicle is being charged.

The system will monitor the power being drawn by the charging process and will compare this to the permissible maximum for the property (which is set as part of the configuration).

With this information, the power made available for charging can be dynamically adjusted to reduce the load before the property's maximum load is exceeded.

For example, if the property's main fuse (or circuit breaker) is rated at 60 Amps, the fuse will operate and cut all power to the property if a draw of 60 Amps is exceeded. It can be relatively easy to draw significant power if several property appliances are in use at the same time.

Household appliance	Current load
Kettle	13A
Oven	13A
Dishwasher	10A
Iron	13A
Total current	49A

In this example, only 11 Amps remain before the 60A limit is reached.

If an electric vehicle is now put on charge and drawing 16A, the limit would be exceeded, and the property's fuse would operate to cut all electrical power to the property.

With load balancing enabled, the amount of power made available for charging will be automatically adjusted to a level that does not exceed the maximum for the property.

IONsens will continue to monitor the power and will dynamically increase and decrease the power made available for charging in response to the demand for power from the rest of the property.

ION charge points are pre-configured to load balance with a 13A 'buffer'.

This means that whatever the property fuse may be load balancing will start 13A before its maximum limit is reached. For example: If the charger is configured by the installer for use with a property with a 60A fuse, load balancing will start at 47A. Similarly, for a property with an 80A fuse, load balancing will start at 67A. This allows combined use of the charger plus other appliances in normal use with no effect on the property's electricity.

In addition to the load balancing there is a built-in safety feature (load management) that regulates and reduces the charging current when the ambient temperature increases thus protecting the unit.

TruePEN PME fault detection device explained.

This device removes the need to install a dedicated earth for the charge point. In the event of a fault, the system will break all power cable connections between the charge point and the vehicle.

A PEN fault is most seen as either, an undervoltage or an overvoltage entering the charge point from the mains supply. Following initial power ON, the system monitors the supply voltage for 5 seconds and determines if the voltage is within normal operating parameters. If within limits, the system allows the connection of Live, Neutral and Earth to the vehicle and continues to monitor the supply.

If the voltage goes out of limits (below 207 Volts or above 253 Volts) for a continuous period of 5 seconds, this could be caused by a PEN fault. The TruePEN device will activate ('trip') and isolate Live, Neutral and Earth to the vehicle.

Undervoltage: Following an undervoltage trip, TruePEN continues to monitor the supply and if the voltage returns to within limits for a continuous period of 5 seconds, the TruePEN device will automatically reset and restore the Live, Neutral and Earth connections to the vehicle, allowing charging to resume.

Overvoltage: An overvoltage condition is potentially more likely to damage the vehicle so, for safety reasons, automatic recovery following an overvoltage is NOT provided and charging cannot resume until a manual reset is performed.

Following an overvoltage condition, EV drivers are advised to investigate as far as they can, the reasons for the overvoltage condition and to check their vehicle for correct operation. Occasional overvoltage conditions may simply be caused by fluctuations in the supply but if they are frequent, the cause should be investigated by an appropriately qualified and experienced electrical engineer and/or the electricity supply company.

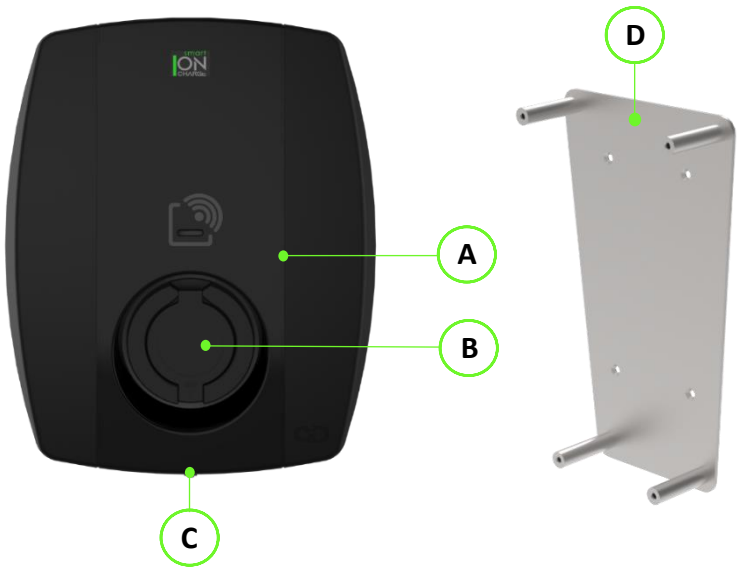
Security –Tamper Protection device explained.

It is a requirement in the United Kingdom that charge points of this type, sold after 30th December 2022, have two-levels of anti-tamper protection.

- Charge points must incorporate a boundary to guard the electrical components from tampering whilst also providing safety to electrical engineers. A tamper proof screw is fitted to prevent inadvertent removal of the front cover. See Fig1 & 3, Item C

- Charge points must log and issue an alert to the customer / user if there is a breach of the boundary. The purpose of this device is to protect people from harm, protect the charge point, the charging network, and the electricity network from malicious or accidental damage or abuse and protect the data held on the charge point.
- A pushbutton switch is fitted beneath the front cover, when the cover is removed the switch will activate and send an alert to the ION charge App notifying the customer / user.
- If the front cover is not fitted, then the EV charger will be inactive.

ION EV CHARGER EXTERNAL COMPONENTS – SOCKETED VERSION Fig.1



Item	Description
A	Front Cover
B	Charging Socket
C	Security Screw
D	Mounting Bracket

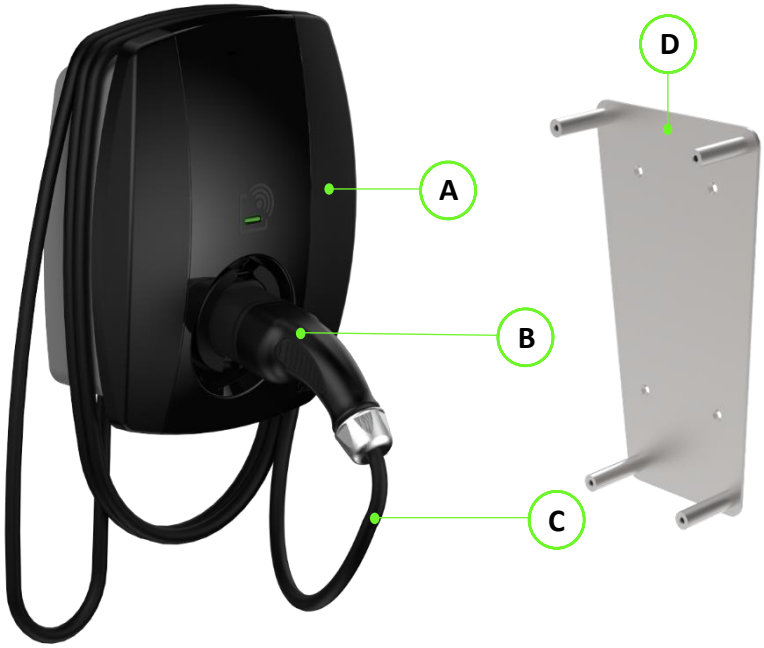
ION EV CHARGER INTERNAL COMPONENTS – SOCKETED VERSION Fig. 2

Item	Description
E	LH Terminal Cover
F	RH Terminal Cover
G	M3 Fixing Screws
H	M5 Fixing Screws

Supplied with:

- IONsens including CT
- 2 x User Key Fob (Pre-paired)

ION EV CHARGER EXTERNAL COMPONENTS – TETHERED VERSION Fig. 3



Item	Description
A	Front Cover
B	Charging Plug + Cable
C	Security Screw
D	Mounting Bracket

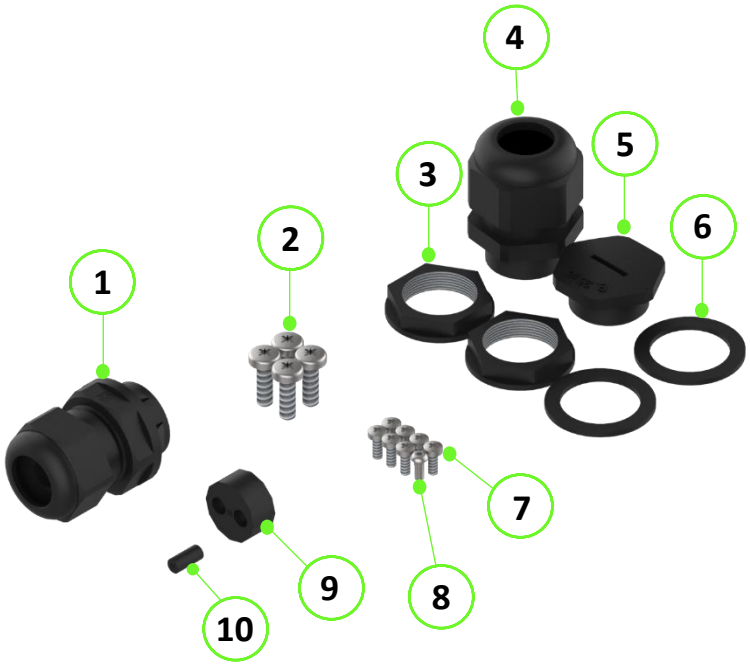
ION EV CHARGER INTERNAL COMPONENTS – TETHERED VERSION Fig. 4

Item	Description
E	LH Terminal Cover
F	RH Terminal Cover
G	M3 Fixing Screws
H	M5 Fixing Screws

Supplied with:

- IONsens including CT
- 2 x User Key Fob (Pre-paired)
- 1 x 5m Type 2 EV Cable & Plug

EV CHARGER KITS Fig. 5



Item No.	Description	Socketed QTY	Tethered QTY
1	M25 Push In Cable Gland	x 1	x 1
2	M5 x 16 Pozi Pan Screw	x 4	x 4
3	M25 Lock Nut	x 2	x 3
4	M25 Nylon Cable Gland	x 1	x 2
5	M25 Blanking Plug	x 1	x 1
6	M25 Sealing Washer	x 2	x 3
7	M3 x 8 Pozi Pan Screw	x 7	x 7
8	M3 x 8 Security Screw	x 1	x 1
9	Sealing Insert For Push-in Gland	x 1	x 1
10	Blanking Insert	x 1	x 1

CHOOSING A LOCATION

Install the EV charger in a location that allows the charging cable to reach the vehicle charge port without putting strain on the cable. The tethered cable length is 5m, therefore, a recommended distance would be no greater than 3m from the car charging point.

CHOOSING A HEIGHT TO FIX THE CHARGER TO THE WALL

We recommend the EV charger is 1.2metre from ground to centre of cable socket.

WALL BRACKET FIXING

Once you have established the correct height, use the wall bracket to mark 4 positions on the wall with a suitable tool. Drill 4 holes and fix the bracket to the wall with suitable C/SK screws (not supplied).

Fix the EV charger to the wall bracket with the 4 off fixing screws (M5 x 16) supplied. Access is through the LH & RH terminal cover apertures.

INSTALL IONSENS

The EV charger is supplied with a load sensing device with one CT clamp. This must be fitted near to your house incoming supply where the house protective fuse and meter is located. See Fig 7, item 1.

The CT Clamp is to be fitted to the incoming cable (see Fig 7 item 2) and the black and white cable must be fitted to the terminals CT1.1 and CT1.2 inside the IONsens enclosure. When using the EV charger power and data cable combined, ensure the data cable is fitted to the IONsens socket (see Fig 6 RJ12) or connect a separate data cable in the same way. For additional monitoring, please contact Craig & Derricott to purchase additional CT clamps.

The IONsens is supplied with fastening pads for fitting to a suitable location inside the house supply box. Please clean the location prior to fixing.

Fig. 6

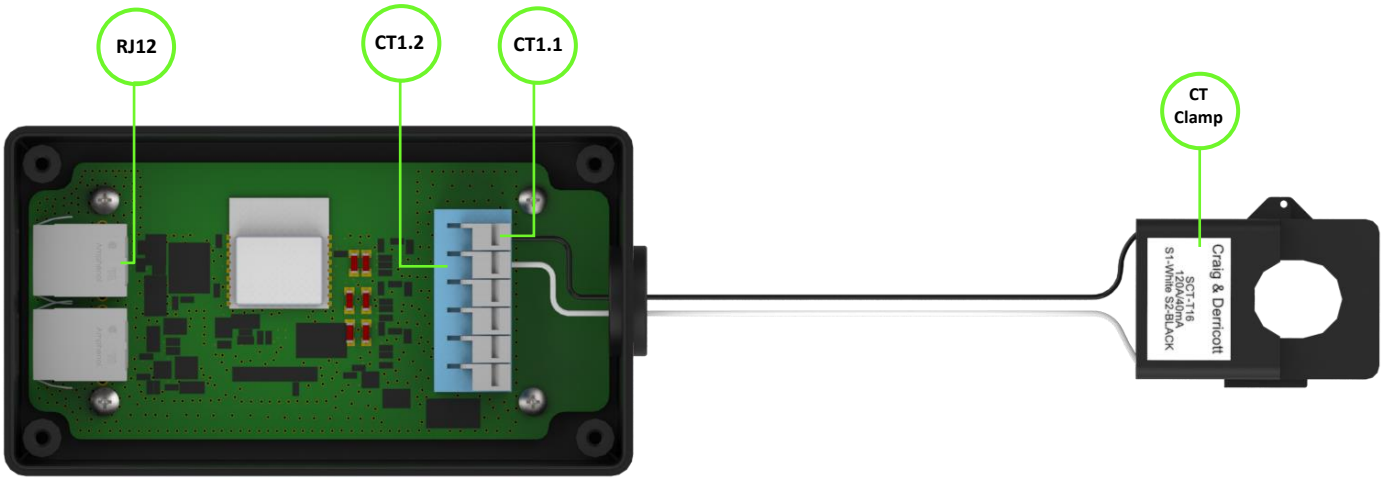
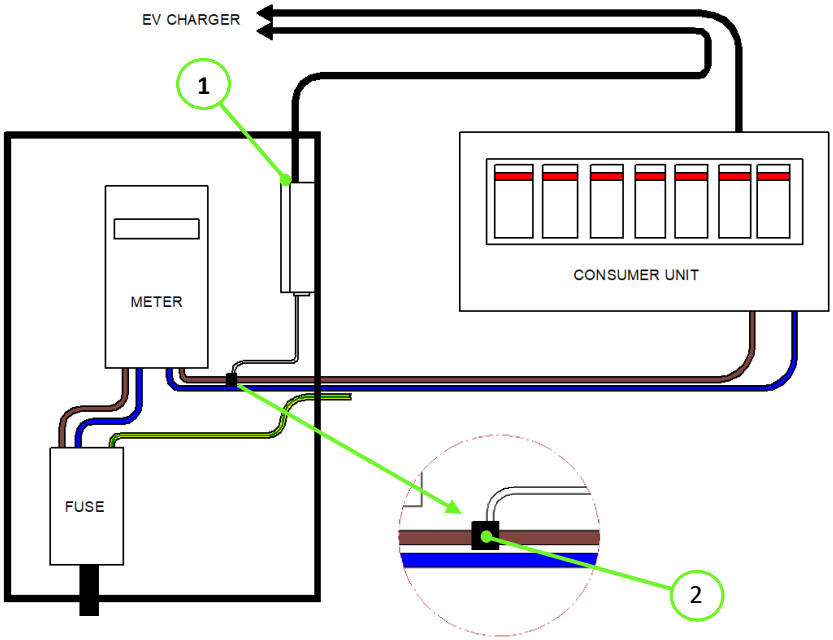


Fig. 7



Item No.	Description
1	ION Sens Unit
2	CT Clamp

MAINS CABLE CONNECTION

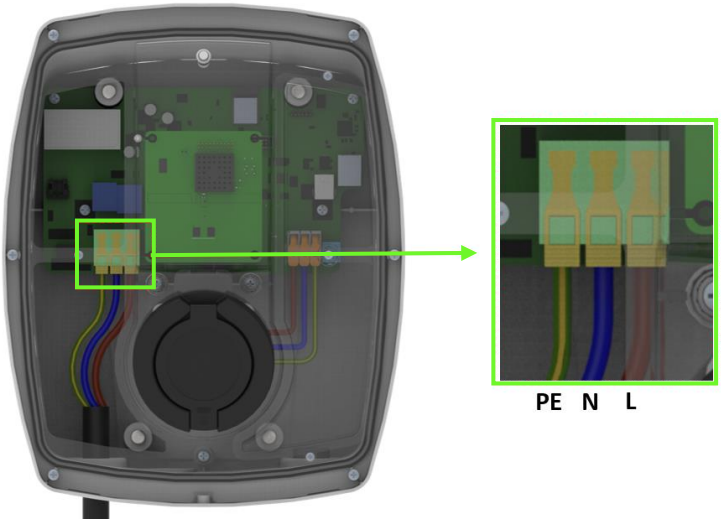
The EV charger is supplied with a Mains M25 Nylon cable gland.

Note: For Steel wire armoured cable, a suitable gland will need to be used (not supplied).

Insert the cable through the LH entry cable gland and tighten the glanding nut. Strip back the cable and terminate the cables into the LH terminal blocks.

Note: Care to be taken when terminating the cables. Ensure the conductors are terminated into their corresponding terminals before energising.

1 x M25 Cable Gland:

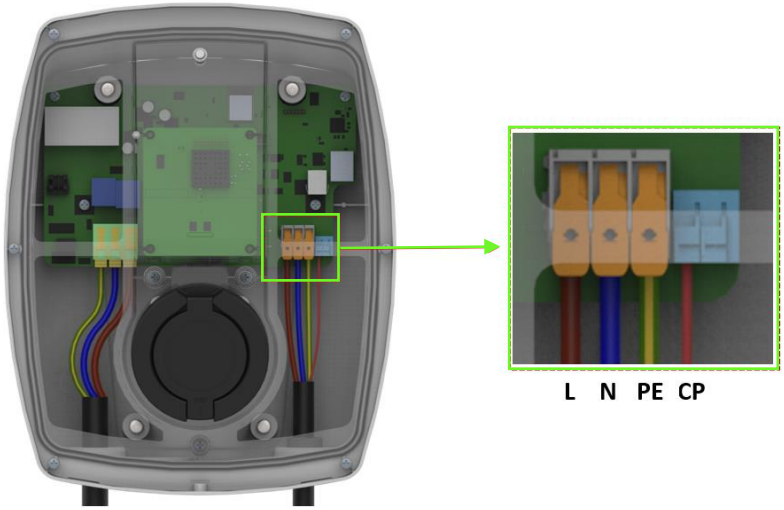


TETHERED CABLE CONNECTION

If you have purchased the EV03221010 (Tethered EV Charger) the cable must be fitted as follows:

1. Mains cable connection, as per Step 3.
2. Insert the cable through the RH entry cable gland and tighten the glanding nut.
3. Terminate the cables into the RH terminal blocks.

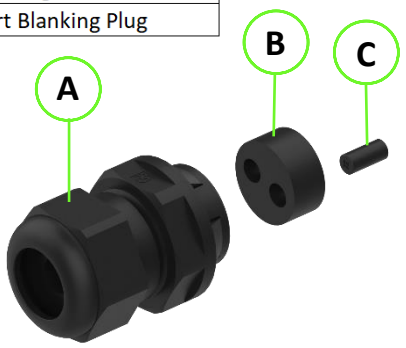
2 x M25 Cable Gland:

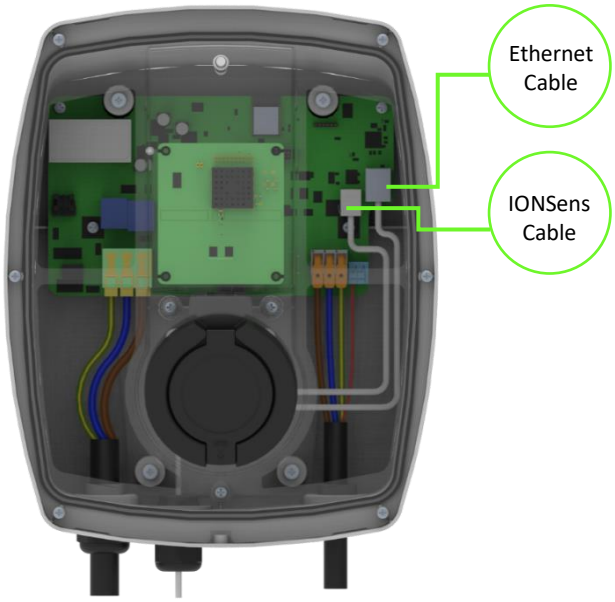


CABLE CONNECTION TO EV CHARGER FOR BOTH ETHERNET & IONSENS

1. Use the push-in cable gland to allow the fitting of the IONsens and optional ethernet cables.
2. The push-in cable gland is only required if the installation power cable has no integrated data cable included.
3. The ethernet cable is only required when the Wi-Fi signal is weak to your router.

Item No.	Description
A	M25 Push In Gland
B	Sealing Insert
C	Insert Blanking Plug



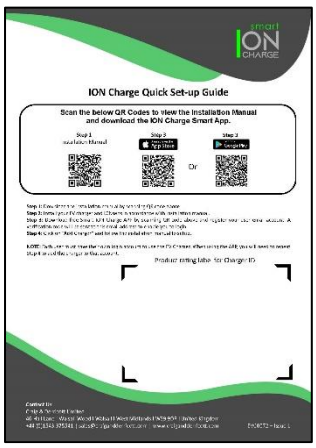
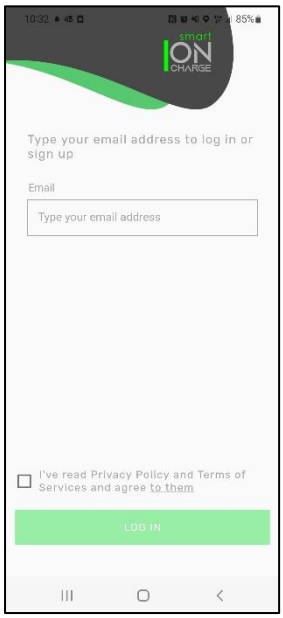
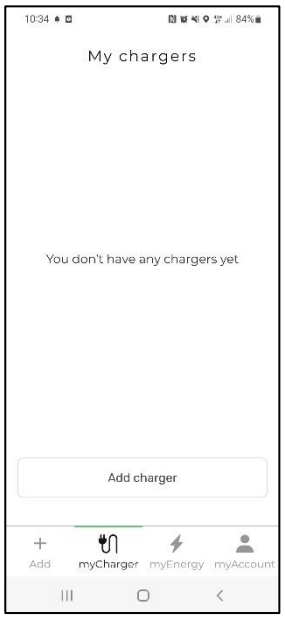


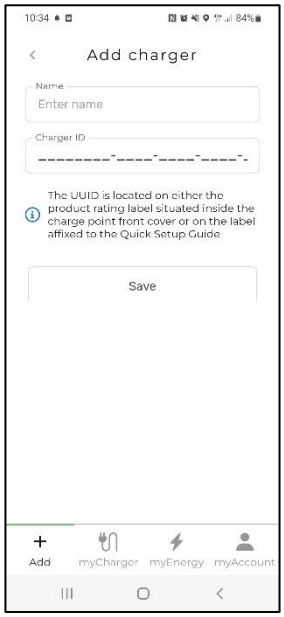
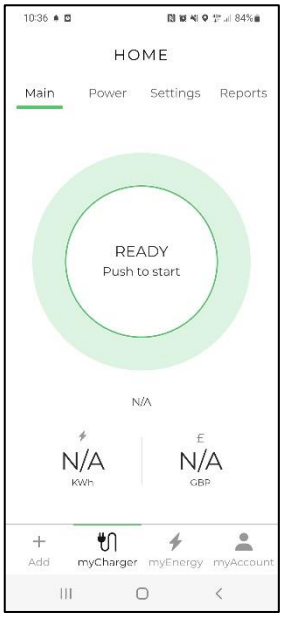
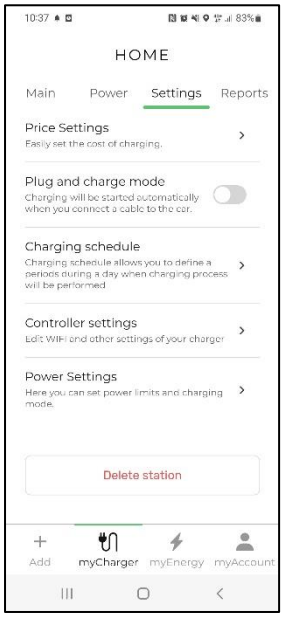
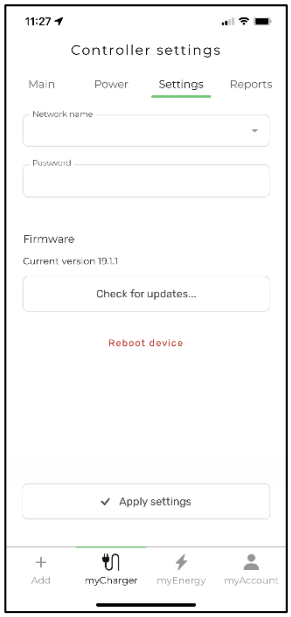
COVER FITTING

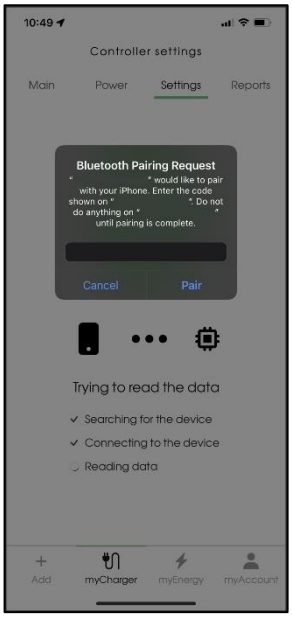
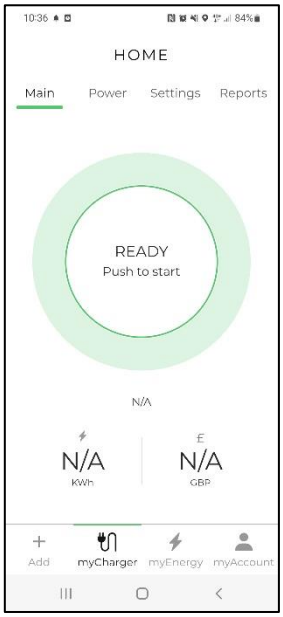
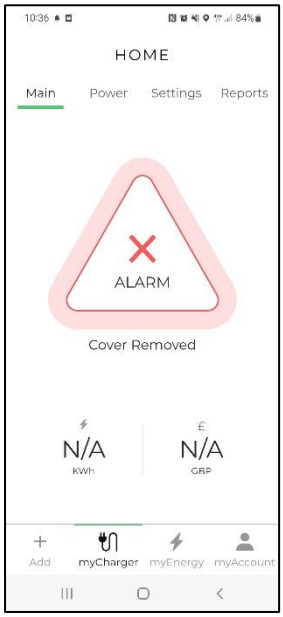
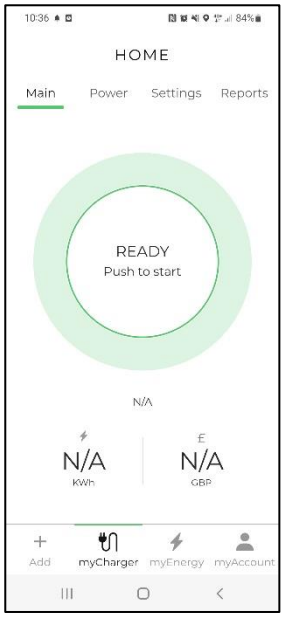
Illustration below for cover fitting

Your charger will require a connection to the Internet. This can be done by either Ethernet or Wi-Fi.

ETHERNET SETUP

Step 1	Step 2	Step 3	Step 4
			
Download the free smart ION charge app by scanning the QR code on the Quick Set-up Guide. This will take you straight to the correct app ready to download.	Ensure your Bluetooth settings are switched "ON" within your device.	Enter a valid email address to create your account. A verification code will be sent to this email address to verify you as the user and enable you to login. Follow the on screen instructions.	Step 1 Once logged in, click on "Add Charger" at the bottom of the screen.

Step 5	Step 6	Step 7	Step 8
			
Name your charger and locate the charger ID. (This can be found on either the Quick Set-up Guide or on the cover of EV charger). Scan the Charger ID QR Code or enter the number manually. Then click “Save”. Security Note: Please keep this number secure.	The app will now take you to the charger home screen and will display “READY”.	Select the “Settings” menu.	Then select the “Controller Settings”.

Step 9	Step 10	Step 11	Step 12
			
The app will then prompt for Bluetooth permission. Enter the 6-digit BLE code (This can be found on either the Quick Set-up Guide or on cover of EV charger). Security Note: Please keep this number secure.	The app will now take you to back to the charger home screen and will display “READY”.	If the front cover has not been fitted or if the cover is removed due to unauthorised tampering an alarm alert will be displayed.	Your setup is now complete, and the charger is ready to use.

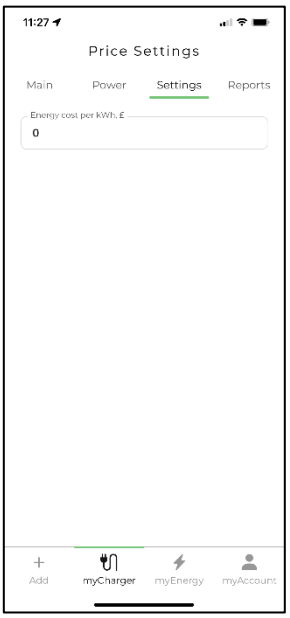
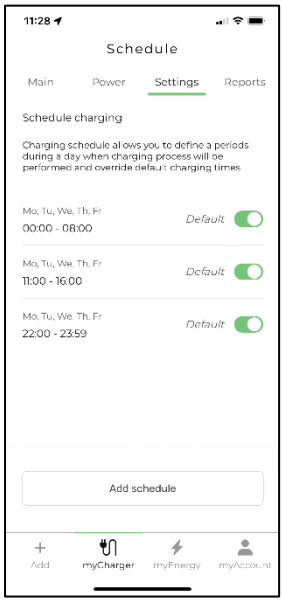
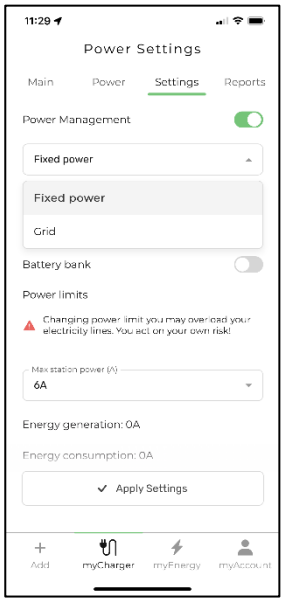
WI-FI SETUP

Follow Step 1 to Step 5 on the Ethernet Setup

Step 6 The app will now take you to the charger home screen and will display “OFFLINE”.
Step 7 Select the “Settings” Menu.
Step 8 Then select the “Controller Settings”.
Step 9 The app will then prompt for Bluetooth permission. Enter the 6-digit BLE code (This can be found on either the Quick Set-up Guide or on cover of EV charger). Security Note: Please keep this number secure.
Step 10 Select your Wi-Fi network name from the dropdown menu.
Step 11 Enter your Wi-Fi password then select “Apply Settings”.
Step 12 The app will now take you to back to the charger home screen and will display “READY”.

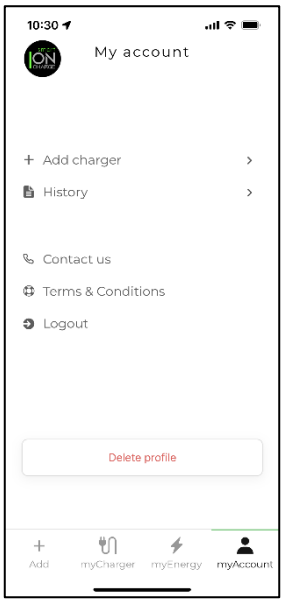
Your setup is now complete, and the charger is ready to use.

CHARGER SETUP GUIDE

Step 1	Step 2	Step 3	Step 4
			
Click on the “Settings” tab	Click on “Price Settings” and enter your Energy cost per kWh. If you click on the “Reports” tab you will be able to see your energy cost and energy consumed, once your charger has been in use.	A default charging schedule has been set within the app, but new schedule times can be setup by clicking the “Add schedule” button.	The Power Management button will be “ON” when IONsens is connected. The drop-down menu allows you to set the max station power. This can be set to between 6A and 32A.

DELETING YOUR PROFILE

To delete your personal information from the IONcharge app, go to the “myaccount” tab and select the “Delete profile” button. Your personal details will be deleted and will no longer be stored within the IONcharge app database.



CHARGER LED STATUS INDICATION

LED Colour	Indication
Green	Charger is online (Standby)
Blue	Charger is online (Car charging)
Yellow	Charger is offline (Standby)
Violet	Charger is offline (Car charging)
Red	Cover removed or charger malfunction
White (Blink)	RFID charger fob is authorised
Red (Blink)	RFID charger fob NOT authorised
Green (Blinking)	Charger is online (Cable connected awaiting charge)
Blue (Blinking, every 10s)	Charger is online - randomised delay for charging session to start (applicable to default schedules only)

RANDOMISED DELAY

Randomised delay means your charging session might take up to 10 minutes to start and could overrun by up to 10 minutes after your scheduled time. Keep in mind that the delay could be anywhere from a few seconds up to 10 minutes and is different each time. Sometimes you will not even notice it.

The purpose of this feature is to help distribute the load on the power grid more evenly, by reducing the chances of multiple EV chargers starting to charge at the same time, which can create a sudden surge in power demand and strain the grid.

If the charger goes offline during a session, the unit will continue to charge the vehicle and indicate Violet. To remove the cable from the socket during charging, the RFID fob is required to be used.

HOW TO USE THE KEY FOB WITH THE RFID

Note: Each charger is supplied with two pre-programmed user key fobs.

When you swipe key fob over the RFID symbol on front cover, this will initialise charging mode and the charger will use the scheduled time, setup within your app to charge your vehicle.

The key fob can be used to initialise charging mode immediately if the EV charger is offline.

GENERAL MAINTENANCE

Should the product be installed in a space that is accessible to the public, observe local and national requirements (e.g., BS 7671) in addition to all other safety information contained within this manual.

CLEANING

Should the product require cleaning for cosmetic purposes, use a damp cloth with an all-purpose household cleaner. Avoid the use of strong chemical cleaners and cleaners that contain oil or alcohol, as this will tarnish the plastic.
Do not use running water or high-pressure water jets.

TROUBLESHOOTING

Please visit C&D website for latest EV charger trouble shooting tips or alternatively contact Craig & Derricott on 01543 375541. Please provide model and serial number.

WARRANTY

The EV Charger is covered for 36 months from proof of purchase. Please visit the Craig & Derricott website to register your purchase.

If the owner does not register their EV charger purchase, the unit is covered under warranty for only 12 months.

The warranty does not cover any damage or malfunction directly, or indirectly caused by, or resulting from, misuse, negligence, accident, or improper installation.

DISPOSAL

This electronic equipment must not be disposed of in household waste. Observe local regulations for correct and environmentally friendly disposal.