



# EO Smart Home Installation Guide

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## 1 Introduction

This document details the installation instructions for the EO Smart Home solution. The solution comprises the following components:

- EO Mini
- EO Hub
- EO Smart Home phone app

The EO Smart Home Solution allows the homeowner to remotely control the charging station. The basic topology is shown below

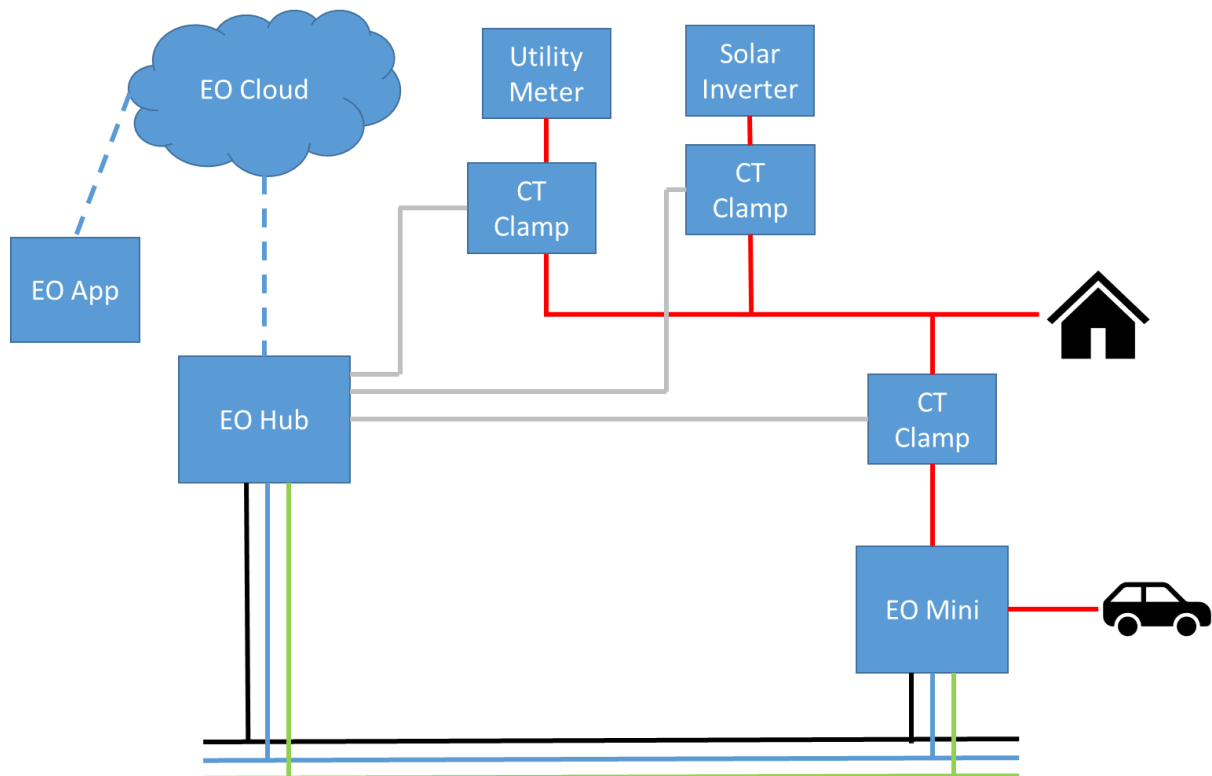


Figure 1 - Smart Home Solution overview

## 2 Installation Instructions the EO Mini

### 2.1 EO Mini - Physical Installation Instructions

- 1) Install the EO Mini as per the instructions on the EO Charging Resource Centre - [EO Mini - Installation Guide](#)
- 2) Set the maximum current setting of the EO Mini as per the instructions on the EO Charging Resource Centre - [EO Mini Current Switch Values.pdf](#)

### 2.2 EO Hub – Physical Installation Instructions

Install the EO Hub in a suitable location close to the output of the electricity meter. Physically mount it to the wall using the mounting holes and four appropriate screws (not included).

### 2.3 EO Mini to the EO Hub Serial Cable

A serial cable is required to connect the EO mini to the EO Hub. Three cables are actually required and so therefore a four core cable is recommended such as below:

- Belden 9842 - LSZH 600V - [Link](#)

### 2.4 EO Mini Serial Connection

The Serial cable should be connected to the EO Mini using the green serial connector as shown in Figure 2

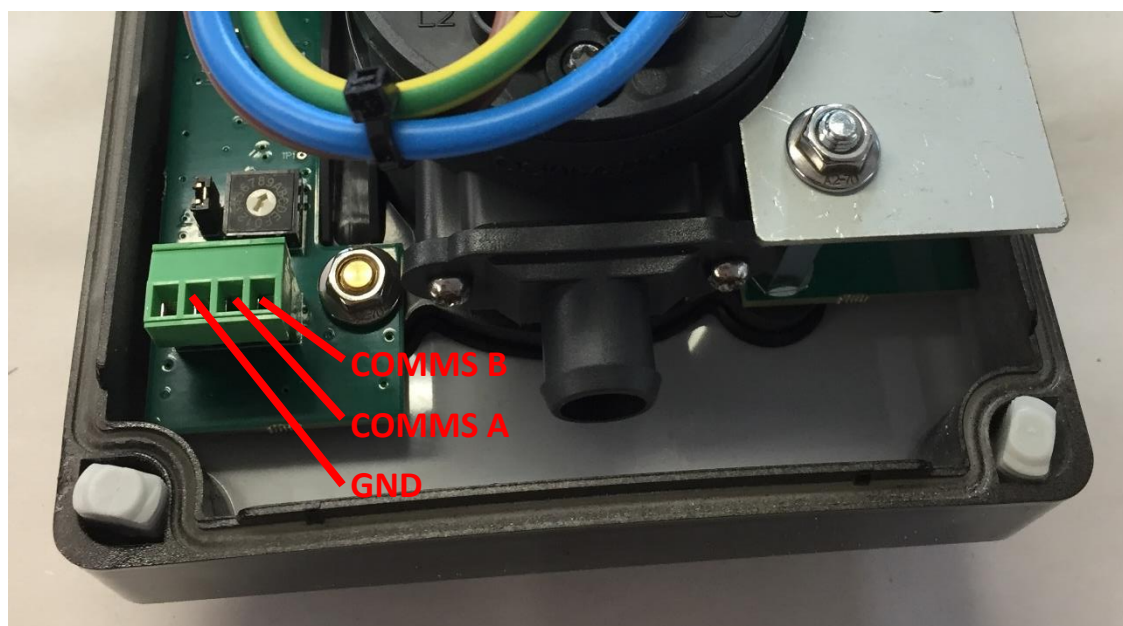


Figure 2 - EO Mini serial connector

There are four connections and from left to right they are:

- DO NOT CONNECT
- GND
- Comms A
- Comms B

## 3 EO Hub Installation Instructions

### 3.1 EO Hub Connections

The EO Hub has the following connections as shown in



Figure 3 - EO Hub connections

### 3.2 Fitting termination resistors to the RS485 Serial Bus

To ensure reliable communication on RS485 serial cable runs of greater than 25m, a 120 ohm 0.25W terminating resistor should be applied at each end of the bus. The following link provides guidance on selection of a termination resistor:

<https://maximintegratedsupport.force.com/support/s/article/RS-485-Termination-Resistor-Power-Rating>

### 3.3 Connecting the Serial cable to the RJ45 connector on the hub

The serial connector on the hub is an RJ45 socket i.e. a standard Ethernet socket. The thickness of the recommended serial cable is too thick to be connected into an RJ45 connector. To overcome this, use the following steps:

- Take a standard CAT 5 Ethernet cable
- Cut a short length with the RJ45/Ethernet plug on one end.
- Strip and expose the bare wires for pins 4&5 for Comms A&B and pin 1 for earth
- Connect the serial cable to the bare wires using a 3 way level connector

A typical finished connection is shown below in Figure 4



*Figure 4 - Connecting the serial cable to the RJ45 socket on the hub*

### 3.4 EO Hub Power

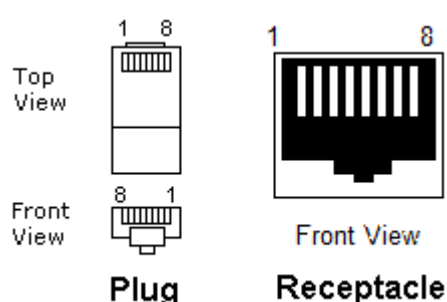
This is supplied via a standard IEC plug. It is recommended that this cable is terminated directly into a 5A fused connection unit (ie not using the 3-pin plug). This avoids the risk of it being unplugged in error.

Regulations state charging equipment must have a dedicated final radial circuit, so EO Hub must not be powered on the same radial as the charging stations. Where a dedicated EV distribution board is fitted, we recommend a single phase supply is taken from this this same board.

### 3.5 EO Mini RS485 serial Comms

The EO Mini charging station needs to connect to the EO Hub via an serial bus. The serial bus connects to the hub via an RJ45 connection. The wiring of the EO Hub RJ45 connector for serial comms is as follows:

- Pin 1 – Earth
- Pin 2 – Unused but connected to GND
- Pin 3 – Unused but connected to GND
- Pin 4 – Comms A – Blue with white stripe
- Pin 5 – Comms B – White with blue stripe
- Pin 6 – Unused but connected to GND
- Pin 7 – Unused but connected to GND
- Pin 8 – Unused but connected to GND



### 3.6 CT Clamps

CT Clamps need to be used for a variety of functions and are required to measure

- the power consumed by the EO Mini
- the output of the solar array
- the consumption of the house

They are to be connected in the following fashion

EO Hub Pin	CT Connection	CT Function
1 (left hand terminal)	L1 – White	House Consumption
2	L1 – Black	
3	L2 – White	EO Mini
4	L2 – Black	
5	L3 – White	Solar output
6 (right hand terminal)	L3 – Black	

### 3.7 Ethernet connection & Network Security Settings

For the EO Hub to communicate to the eoCloud back office Portal, an internet connection is required. This can be provided either through a hard wired ethernet connection (e.g. into the house's LAN or router) or through a local Wifi connection.

As standard, the EO Hub IP address and DNS server address are assigned via DHCP. Once assigned, it is best if the IP address is reserved in the DHCP table. For sites where a fixed IP address is required please contact EO Support for advice.

It is possible to check the local connection is valid by clicking on either of the two links below

<http://porttest.eocharging.com:4455>

<http://porttest.eocharging.com:4456>

### 3.7.1 GPRS Modems

Rather than using a wired internet connection, it is possible to connect the EO Hub to a wireless 4G modem. Eo can supply these pre configured but if a third party modem is used then consider the following points to ensure that a connection is trouble free:

- Update the APN settings for the mobile network
- Turn off any VPN settings

## 3.8 Boot Up

On power up, the EO Hub performs a boot up sequence which can take around 90sec to complete. When a successful boot up sequence has completed, then the left hand LED and the middle LED are solid green.

These LEDs can also provide diagnostic information for the support team.

## 3.9 LEDs

There are three status LEDs on the EO Hub as shown in **Error! Reference source not found.**. LED1 is on the far left, LED2 is in the middle and LED3 is on the far right. These LEDs are either illuminated green or off. The LEDs indicate different stages of operation with the principle stages being “Start Up” and “Normal Operation”

### 3.9.1 Start Up

Stage	LED1	LED2	LED3	Repeats	Description
1				6 times	Start Up
2				Solid	Error state – contact EO
3				2 Flashes	Connecting to primary server
4				2 Flashes	Connecting to Secondary server if primary failed
5				6 times	Failure to Connect – Check Internet connections
6				6 times	Start Up successful
7				5 times	Fatal Error – Contact EO

After a successful start up, then the EO Hub shall enter into Normal Operation.

### 3.9.2 Normal Operation

Stage	LED1	LED2	LED3	Repeats	Description
1				6 times	Secondary Start Up
2				Solid	Internet Connection Test
3				Solid	Configuring Hub – this can take up to 60sec

4				LED1&2= Solid LED3 = Blinks rapidly	The EO Hub is communicating with the EO charging stations.  This is the normal operational state.
5				LED1,2,3 = Solid	The EO Hub is connected to the EO Cloud but no charging stations have been allocated to the EO Hub

## 4 Connecting the Smart Home to the EO Cloud

The process for connecting the EO Mini can be summarised into the following steps:

- 1) Installer - Download the EO Smart Home app onto a smart phone and create an account
- 2) Installer - Using the app, connect to the WiFi hotspot created by the EO Hub and enter site details such as Solar, ALM and site capacity.
- 3) Installer – Check that the hub can communicate to the Mini and CT Clamps i.e. check that the physical installation is correct
- 4) Home Owner - Download the EO Smart Home app onto a smart phone and create an account
- 5) Home Owner – using the app enter user details such as vehicle, location
- 6) Home Owner – join the EO Hub to the local wifi
- 7) Home Owner – Start charging!

At this point it is possible to view the status of the EO Mini using the app.

### 4.1 Creating an account

- 1) Install the EO Smart Home app onto your mobile device.
- 2) Log into the EO Smart Home app. If you do not have an account, create one.

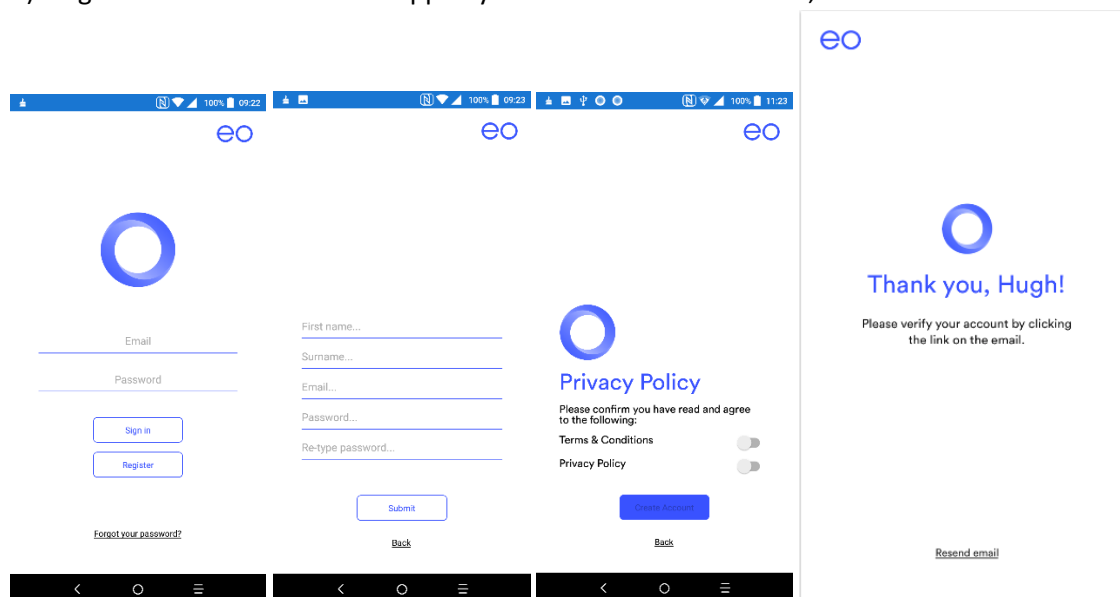


Figure 5 - Creating an account for the EO Smart Home App

3) Start to create the User's profile

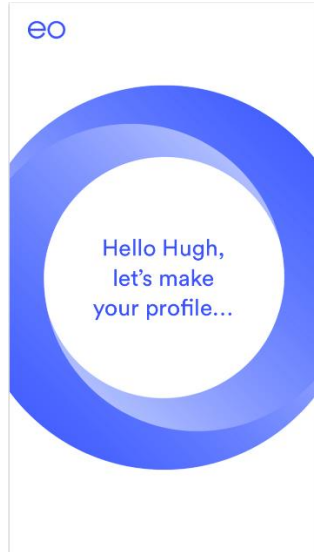


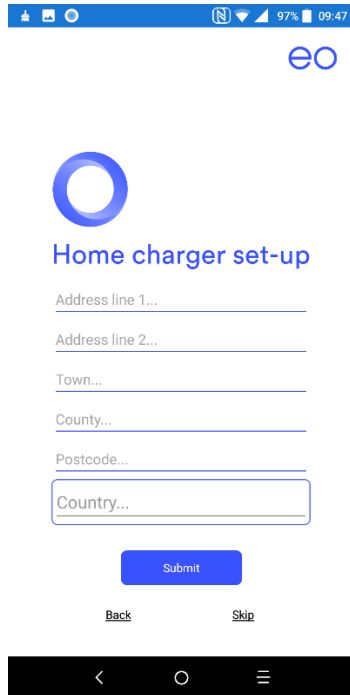
Figure 6 - Start to make the User's profile

4) Select the Vehicle details – this will enable the cloud to enable advanced features such as intelligent charging

A screenshot of a mobile application interface for selecting vehicle details. At the top left is the 'eo' logo, and at the top right is a hamburger menu icon. Below the logo is a blue circular graphic. The text 'What EV do you have?' is displayed. Below this text are three dropdown menus labeled 'Manufacturer...', 'Model...', and 'Year...', each with a blue arrow icon on the right. At the bottom of the screen are two buttons: 'Back' and 'Skip'.

Figure 7 - Selecting the EV

5) Enter the address of the site



The screenshot shows a mobile application interface for 'Home charger set-up'. At the top, there is a status bar with various icons and the time 09:47. Below the status bar is the 'eo' logo. The main heading is 'Home charger set-up'. There are six input fields for address information: 'Address line 1...', 'Address line 2...', 'Town...', 'County...', 'Postcode...', and 'Country...'. The 'Country...' field is currently selected. Below the input fields is a blue 'Submit' button. At the bottom of the form are two links: 'Back' and 'Skip'. The entire form is set against a light blue background.

Figure 8 - setting the address

IMPORTANT – Installers need to have their account set to INSTALLER status which can only be done by a member of EO Support. Please contact [support@eocharging.com](mailto:support@eocharging.com) or +44 (0) 333 77 20383

## 5 Installer – Check the EO Mini and EO Hub are wired correctly

The Installer must first verify that the hub is connected to the EO Mini and the CT Clamps. This is done using the following simple steps

- 1) Select “Begin Installation” from the left hand menu

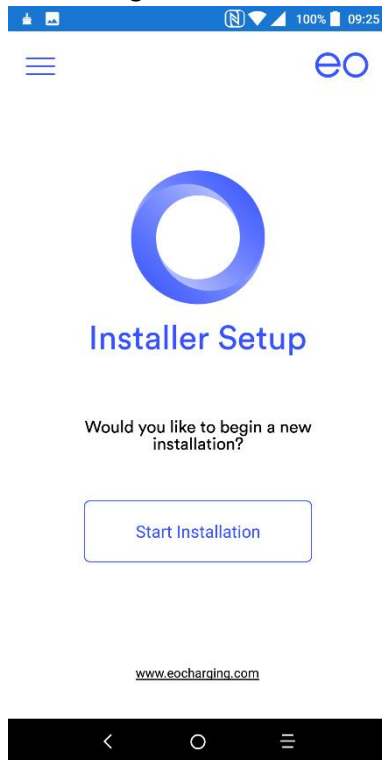


Figure 9 - Installer - starting an installation

- 2) Click Start Installation and the app will search for the wifi of the Hub. The hub should be emitting the “eoHubDualWifi” SSID. If successful then the installer will be able to configure

the following options

Site Voltage

Site Supply (Amps)

Safety Margin (Amps)

Does the hub have solar?

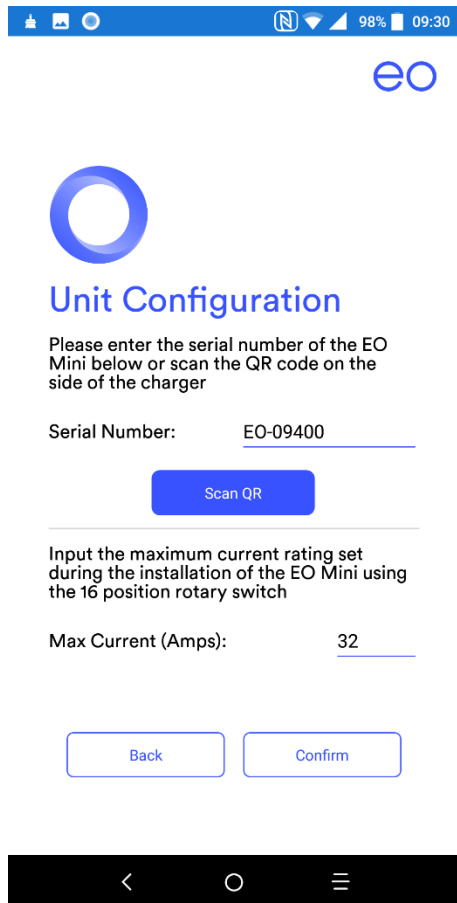
CT1 Rating (Site)

CT2 Rating (Site)

Confirm

Figure 10 - Installer - adding site specific installation details

- a. Does the site need Load Management?
  - b. Site Voltage
  - c. Site Supply
  - d. Safety Margin (a 10% value is automatically suggested)
  - e. Does the site have Solar
  - f. CT Rating for Site
  - g. CT Rating for the Mini
  - h. CT Rating for Solar
- 3) The Installer now needs to enter the Serial Number and the Maximum current rating of the connected EO Mini.



The image shows a mobile application interface for 'Unit Configuration'. At the top, there is a status bar with icons for signal, Wi-Fi, battery (98%), and time (09:30). Below the status bar is the 'eo' logo. The main heading is 'Unit Configuration' with a blue circular icon. The text below the heading says: 'Please enter the serial number of the EO Mini below or scan the QR code on the side of the charger'. There is a text input field for 'Serial Number:' with the value 'EO-09400'. Below this is a blue button labeled 'Scan QR'. Further down, the text says: 'Input the maximum current rating set during the installation of the EO Mini using the 16 position rotary switch'. There is a text input field for 'Max Current (Amps):' with the value '32'. At the bottom, there are two buttons: 'Back' and 'Confirm'. The very bottom of the screen shows a black navigation bar with a back arrow, a home circle, and a menu icon.

Figure 11 - Installer - Adding information about the Mini

- 4) The App will now connect to the EO Hub, send down the details and then perform a connectivity test. If everything is wired correctly then the tests shall pass.

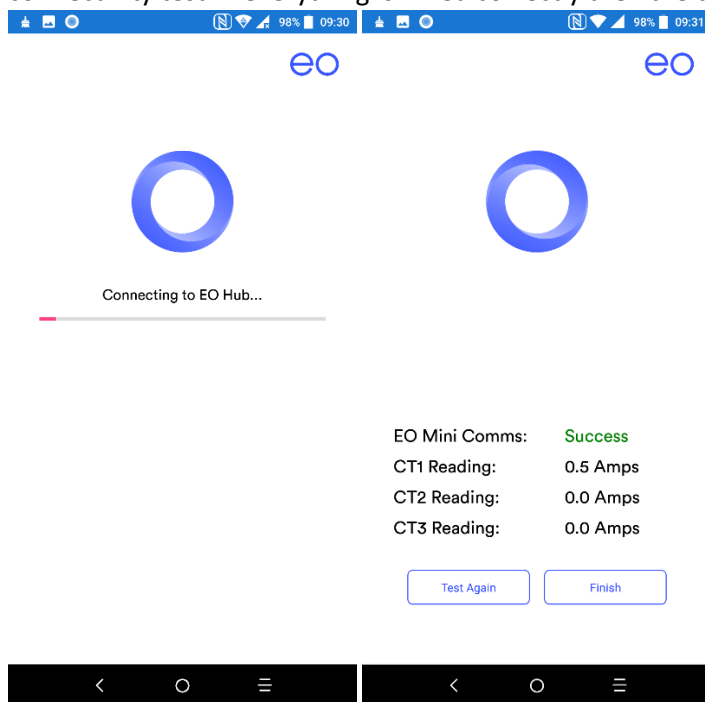


Figure 12 – Installer - Comms test between the EO Hub and EO Mini

At this point the Installer's section is complete and the homeowner now needs to complete the set up with the site specific details such as wifi code.

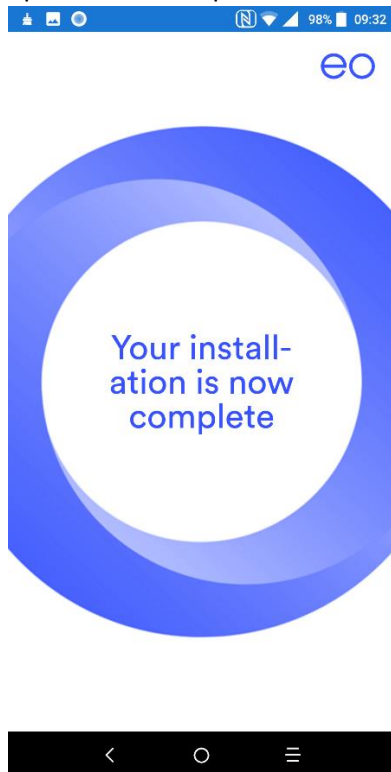


Figure 13 – Installer - First half of the installation is complete

## 6 Home Owner – Connect the hub to the wifi

- 1) The homeowner needs to log into their version of the app. If the following screen is not shown then select “My EO Home from the left hand menu”

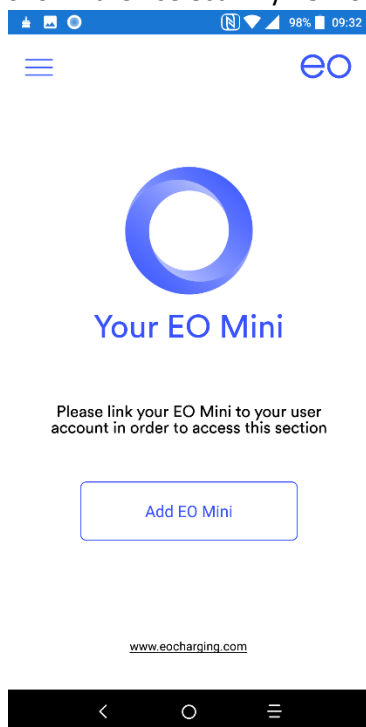


Figure 14 – Home Owner - starting to connect the hub to the wifi

- 2) Enter the site address

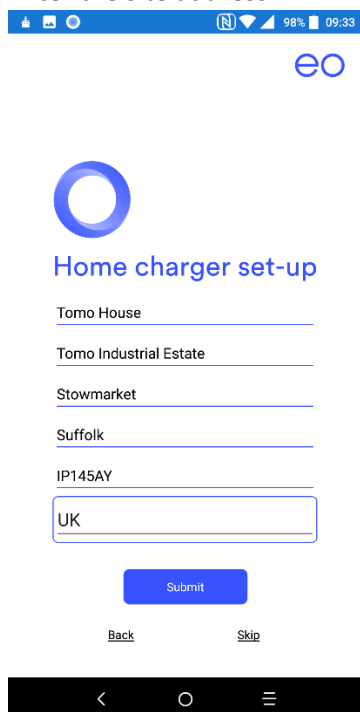


Figure 15 - Home Owner - Entering the site's address

- 3) The app will now scan for any available Wifi and ask the Home Owner which Wifi the EO Hub should join

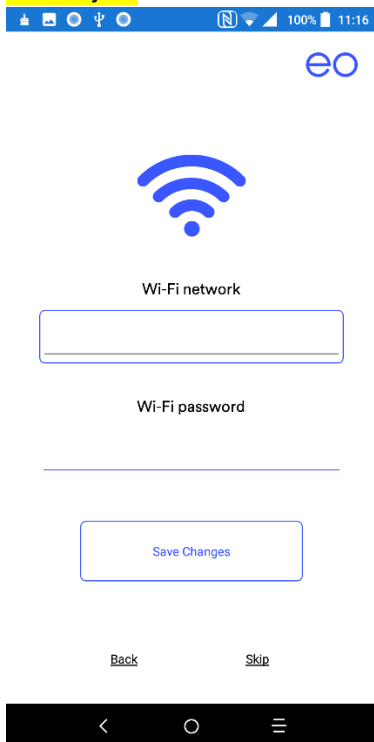


Figure 16 - Home Owner - Enter the wifi details

- 4) The hub shall now join the wifi and associate the EO Hub and the EO Mini to the Home Owner's account.

## 6.1 Success

At this point all of the installation is complete and the home owner can use their new EO Smart Home solution.

Figure 17 - Another successful installation is completed!

## 7 Further Technical Support

All EO Charging technical documentation is published in the EO Resource Centre, this is found at:  
<https://www.eocharging.com/service-support/>

The EO Support team can be reached at:

- Email: [support@eocharging.com](mailto:support@eocharging.com)
- Phone: +44 (0) 333 77 20383