

EO MINI PRO 3

↘ INSTALLATION & COMMISSIONING GUIDE



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Important: Read carefully before use. Keep for future reference.

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→ 1.0 INTRODUCTION

This document covers the details of the EO Mini Pro 3 product.

- + Product summary.
- + Physical installation.
- + Product data.
- + Device configuration.
- + Advanced features.
- + A detailed description of each of the menu pages.

The documentation in this guide is based around Firmware version 1.3.5.

1.1 PRODUCT SUMMARY

| Topic | Mini Pro 3 |
|--------------------|--------------------------|
| Audience | Domestic |
| EO Cloud interface | ev.energy Smartphone App |
| Switch gear | Relays |
| Metering | Internal |
| RFID | No |
| Power | Single Phase – 7.2kW |



It is important to note that the information in this document is subject to change without notice as the EO Mini Pro 3 product evolves, please download the latest version from www.eocharging.com/support.



EO Products should be installed by an EO Approved Installer. Please see section 9 for more information.



→ 2.0 QUICK REFERENCE GUIDE

2.1 EO MINI PRO 3 INSTALLATION

1. If you have never installed an EO Mini Pro 3 then please complete the Installer Training on the EO Academy – refer to the training academy link on the support page.
2. Open up the EO Mini Pro 3 and use the drilling template on the back of the installer guide to help mount the base on to the wall.
3. Use the cable template on the installer guide to prepare the input cables (Power and CT clamp connections).
4. Take a photo of the installer label on the inside of the base. This is required for commissioning (step 9 below).
5. Connect the power cables to the EO Mini Pro 3 (Remember to use the supplied cable restraint and stepped grommet to ensure ingress protection).
6. Connect the comms cable from the back of the EO Mini Pro 3 to the front of the EO Mini Pro 3, close the EO Mini Pro 3 (put the rubber washers on the hex bolts) and attach the fascia (insert top first).
7. Power up the EO Mini Pro 3.
8. When the LED has changed from white to blue (which can take 2 min) then join the wifi hotspot e.g. eo-01234567890 (refer to the photo taken in point 4 for login credentials).
9. Go to <https://10.10.10.1> on a web browser and click through security warnings. Login with username “Installer” and the password from the photo in step 4. Then set the following as a minimum:
 1. **Smart Charging** – If you want to perform safety tests then you may want to disable the default profiles and random delay. Remember to re-enable them before handing over to the customer as per UK Smart Charging Regs.
 2. **Network** – Check the APN details for GSM enabled units (if required).
 3. **Installer** – Timezone, max current, contact details, tamper (bump=2, tilt=10) and CT clamps (if load management is required).
 4. **Load** – load management & Solar settings (if required).
 5. **CSMS URL** – This must be replaced to point the charger to ev.energy. Replace CSMS URL with:
 - a. <wss://ocpp.ev.energy:443>
10. Log out and the unit is ready to hand over to the customer. Also hand over the customer card as they will need this for final setup.



2.2 LEDS

| LED Colour | State |
|---------------------|---------------------------------|
| White | Bootup |
| Flashing blue | Ready |
| Flashing green | Car plugged in but not charging |
| Green | Charging |
| Yellow | Paused |
| Cyan | Random delay |
| Flashing blue/green | Firmware is updating |
| Flashing red/green | Tamper has been activated |
| Red | Error state |

2.3 SIMPLE OPERATION

In order to use the charging station:

- + Ensure that the charging station is powered up.
- + Plug the cable into the vehicle.
- + Plug the other end of the charging cable into the vehicle. The vehicle will start to charge immediately or as per the schedule on the cloud or app.



→ 3.0 PREPARATION FOR INSTALLATION

3.1 EQUIPMENT

Ensure that the appropriate tools are used to mount the charging stations along with the appropriate power cables, MCB and RCDs.

3.2 NETWORK (LAN) CONNECTIVITY

When using a hard-wired connection to a LAN, make sure a working connection to the client's network is available prior to installation or the charging stations will fail to connect to the CSMS (charge station management system). When connecting to the CSMS please ensure that ports 80 and 443 are open.

3.3 WI-FI CONNECTIVITY

If the EO Mini Pro 3 is to use Wi-Fi for its internet connection to a back-office platform, before fitting the device in place, it is recommended that the strength and integrity of the Wi-Fi signal is checked. If a weak Wi-Fi signal is present, then there is a chance that the installation of the EO charging station may fail. To check that the Wi-Fi signal is strong enough please complete the following steps:

1. Ensure that a 2.4GHz wifi network is available.
2. Utilise a suitable Wi-Fi analyser mobile device app to verify signal stability, strength, and interference levels.
3. Using a mobile device connect to the premises' Wi-Fi router (if the customer grants permission).
4. Measure the data rate and signal noise. The data rate should be greater than 5mbps and using an appropriate mobile app, measure the signal noise [RSSI] value which should be less than -67dBm.

If the Wi-Fi is not suitable, a couple of options exist:

1. Install a 2.4GHz Wi-Fi booster.
2. Use the hard-wired ethernet option.
3. Request a charger with the 4G GSM internal modem assuming that a suitably strong GSM signal strength is available.



→ 4.0 INSTALLATION INSTRUCTIONS FOR THE EO MINI PRO 3

4.1 PHYSICAL INSTALLATION INSTRUCTIONS

1. Remove the EO Mini Pro 3 from the packaging.

The fascia will be the final component to fit and it's here you will find the “Installer Access Label”.

The centre section contains the charger socket and main electrical components.

The rear housing contains the Wi-Fi and where applicable the GSM PCB.

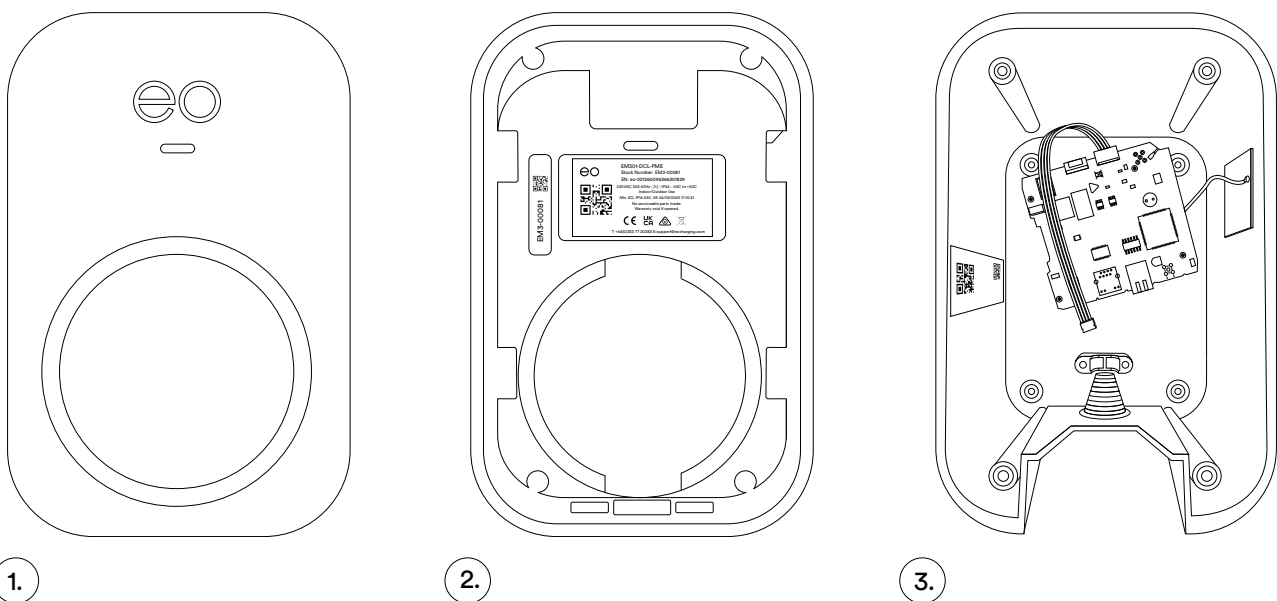


Figure 2: Box contents.

1. EO Mini Pro 3 front fascia.
2. Main section.
3. Rear housing, Wi-Fi PCB and “Installer Access Label”.

2. Take a photo of the Installer Label on the base as this contains the login credentials that are needed for the software configuration of the Mini Pro 3.



3. After you have verified the stability of the Wi-Fi, and found a suitable mounting location, offer the quick installer guide to the installation location; make sure the surface is flat and level.

Level the drilling template in the correct position and drill through the template to accurately position the mounting holes for the Mini Pro 3.

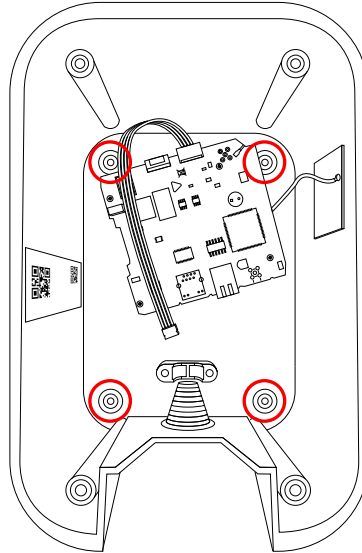


Figure 3: EO Mini Pro 3 backplate.

4. Attach the EO Mini Pro 3 base to the wall using the four screws provided. Ensure the charger is secure and flush against the wall. Use packing washers if necessary for a flush fit.
5. Strip and prepare the power cable and feed into the pre-made hole and stepped grommet. Use the supplied cable restraint or alternatively a 25mm gland can be used (not supplied).

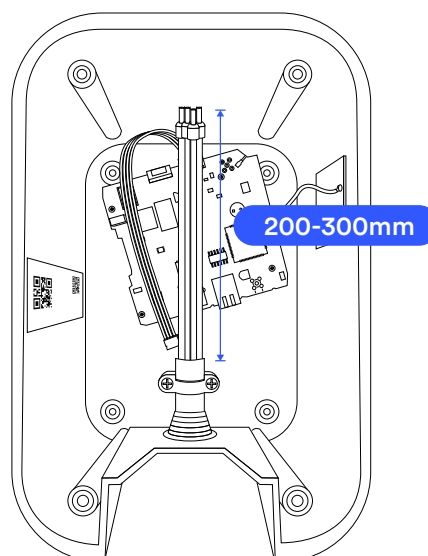


Figure 4: Stripped power cable and entry point.



6. Connect the Live, Neutral, and Earth wires to the charger connector block accordingly.

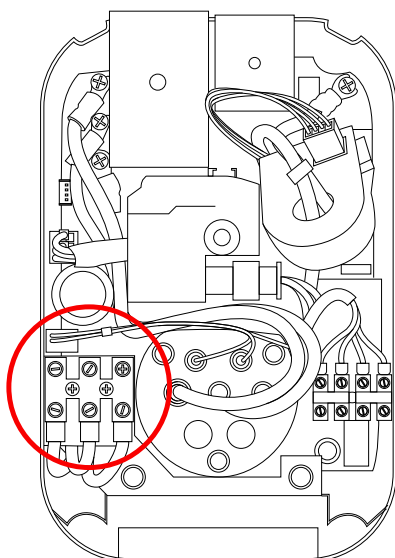


Figure 5: Connector block.

7. If using Ethernet as a means of connecting to the client router or CT clamps need to be fed into the Mini Pro 3, then the second aperture can be drilled out and a suitable gland fitted.

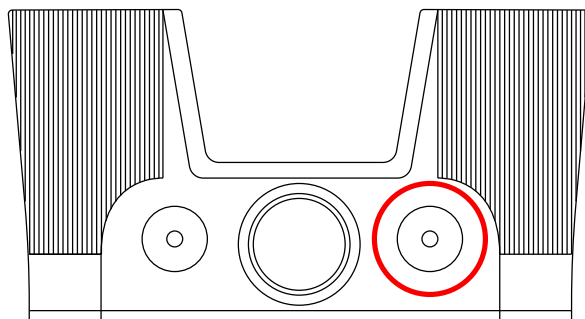


Figure 6: Ethernet cable entry point.



8. The rear charger housing allows for one rear cable entry using the position as shown on the image.



DO NOT drill into any other area of the housings as doing so will Invalidate the product warranty and could damage the rear internal PCB.

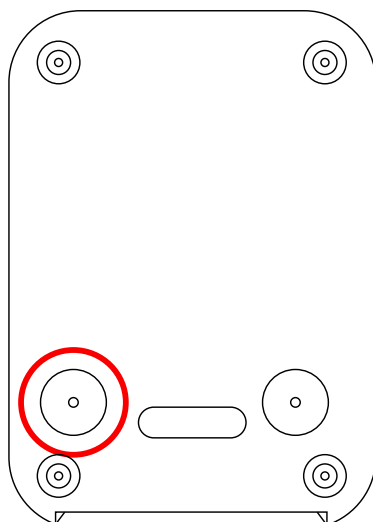


Figure 7: Rear view - cable entry point.

9. If using Ethernet, connect it to the RJ45 female connector located on the Mini Pro 3 circuit board.

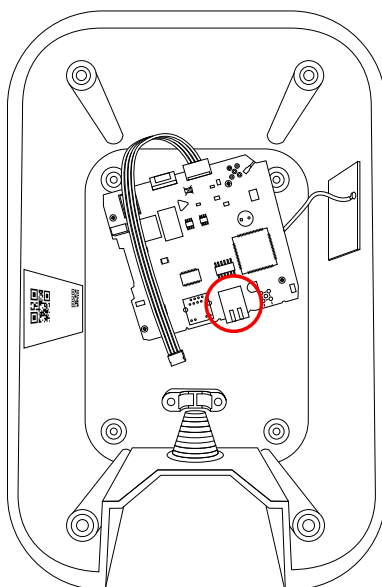



Figure 8: RJ45 female connector location.



10. If connecting CT clamps for either load management or solar, a four-pin connector block is provided and situated lower right.



IMPORTANT: If a separate CT wiring label is supplied with the charger, follow the instructions on this label as it will be specific to the charger version and supersedes this document.

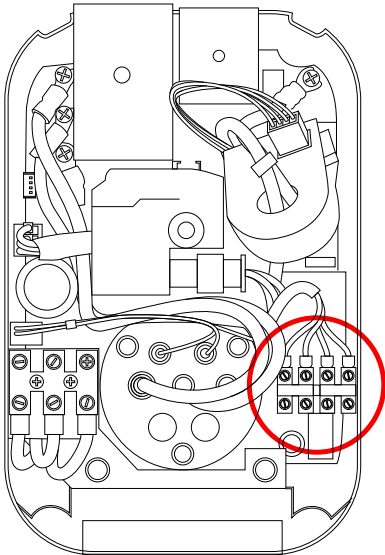


Figure 9: CT connector block.

Both the chart and image show wire designations for both load management and solar CTs clamps.

| CT Assignment | CT wiring colour | Function |
|---------------|------------------|----------|
| CT1A | Red | ALM |
| CT1B | White | ALM |
| CT2A | Red | Solar |
| CT2B | White | Solar |

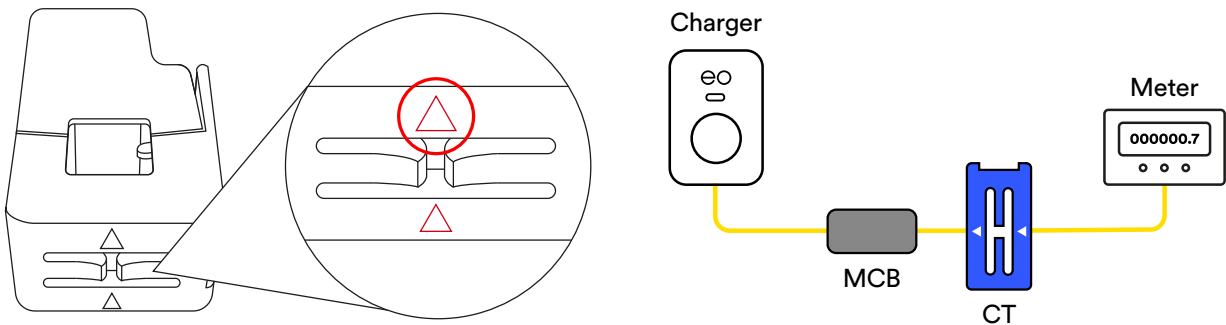


Figure 10: CT orientation (image for illustration purposes only).



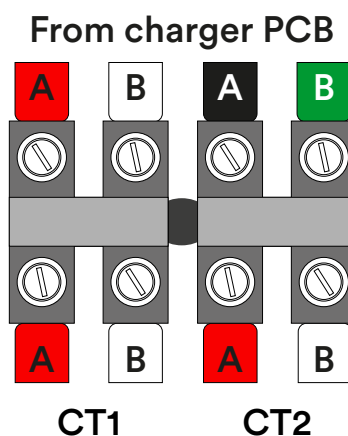


Figure 11: CT destinations.

Our supplied CT clamps will have a red and white wire attached to them. The CT for load management should be connected to CT1. Connect the Red wire to position A and the white wire to position B. For an additional solar clamp then connect to CT2, with the red wire to position A and white wire to position B.

Make sure you orientate the CT clamps correctly when connecting them to the supply cable. The orientation can be checked in the info page of the Mini Pro 3 when it has powered up - see section 5.1.

The clamps have an arrow which should be orientated with the current flow, which is the flow from the supply.

The orientation of the CT clamps can be verified in the info page of the Web Interface.

11. Before closing the charger case, make sure the PCB tethering lead is plugged in and connects both front and rear PCB boards together.



Make sure the lead is connected in the right-hand female connector of the rear case, as seen in the image.

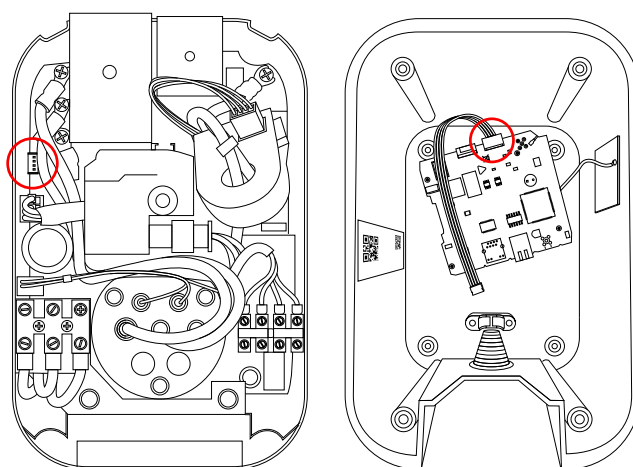


Figure 12: PCB connectors - front to rear case.



12. With all cables securely connected, close the Mini Pro 3 cases together, making sure all internal cabling is not trapped and secure the housings together with the four hex bolts and washers.
13. Attaching the fascia to the EO Mini Pro 3 should be carried out after all testing is complete.



Figure 13: EO Mini Pro 3.



4.2 TN/IT WIRING CONNECTIONS

It is possible to configure the EO Mini Pro 3 to connect to either TN or IT grid types which are shown in the following section.

| Wiring system | Power connections on EO Mini Pro 3 | | |
|---------------|------------------------------------|----|----|
| | PE | N | L1 |
| TN (230V) | PE | N | L1 |
| IT (230V) | PE | L1 | L2 |

PE = Protective Earth
N = Neutral
L1 = Line/Phase 1
L2 = Line/Phase 2

The phase rotation and grid selection (IT/TN) should be set as per the instructions.

The EO Mini Pro 3 is now physically installed and the software commissioning of the charger can now begin.

4.3 MAINTENANCE

The EO Mini Pro 3 should be maintained periodically. Maintenance should include physical cleaning of the unit and the pins of the socket/plug. Additionally, the RCD/MCB should be tested as per the manufacturer’s instructions.



→ 5.0 DETAILED DESCRIPTION OF WEB INTERFACE

The following section provides a detailed view of the web interface of the EO Mini Pro 3.

5.1 INFO PAGE

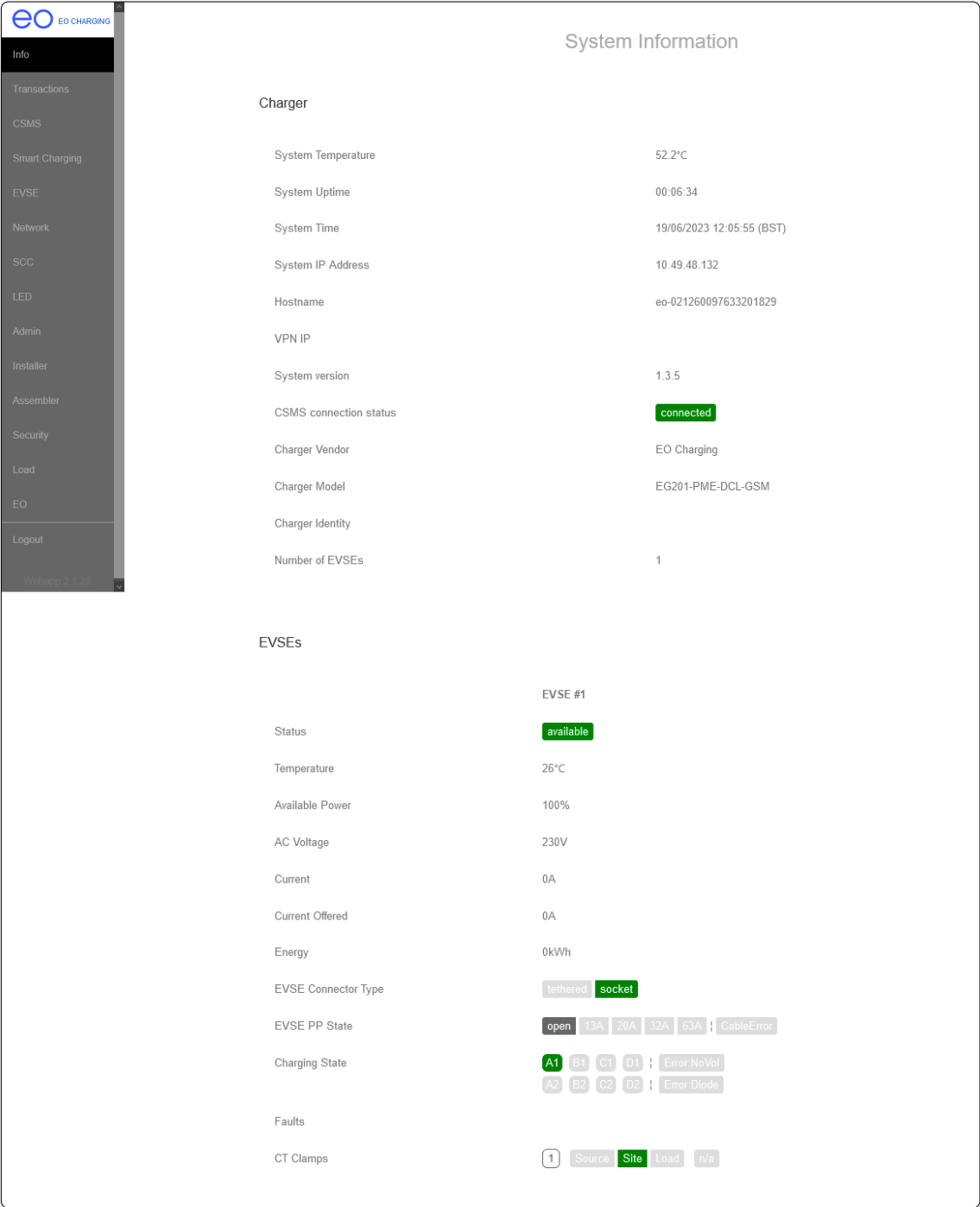


Figure 14: System information page.

This is a very useful page as it displays some important information to determine if the charging station is working as expected. This includes:

- + CSMS Connection State – is the charging station able to make a connection to the OCPP server.
- + Status – OCPP status of the charging station.
- + Current and current offered – how much current is being offered to the vehicle and how much current is being drawn by the vehicle.
- + Faults.
- + CT Clamps.
- + If CT Clamps are enabled then this will show a +VE or -VE value in mA.
 - + +ve value = current import e.g. current is flowing from the grid into the house.
 - + -ve value = current export e.g. current is flowing from the house into the grid.



5.2 TRANSACTIONS

The transactions screen is broken down into two halves.

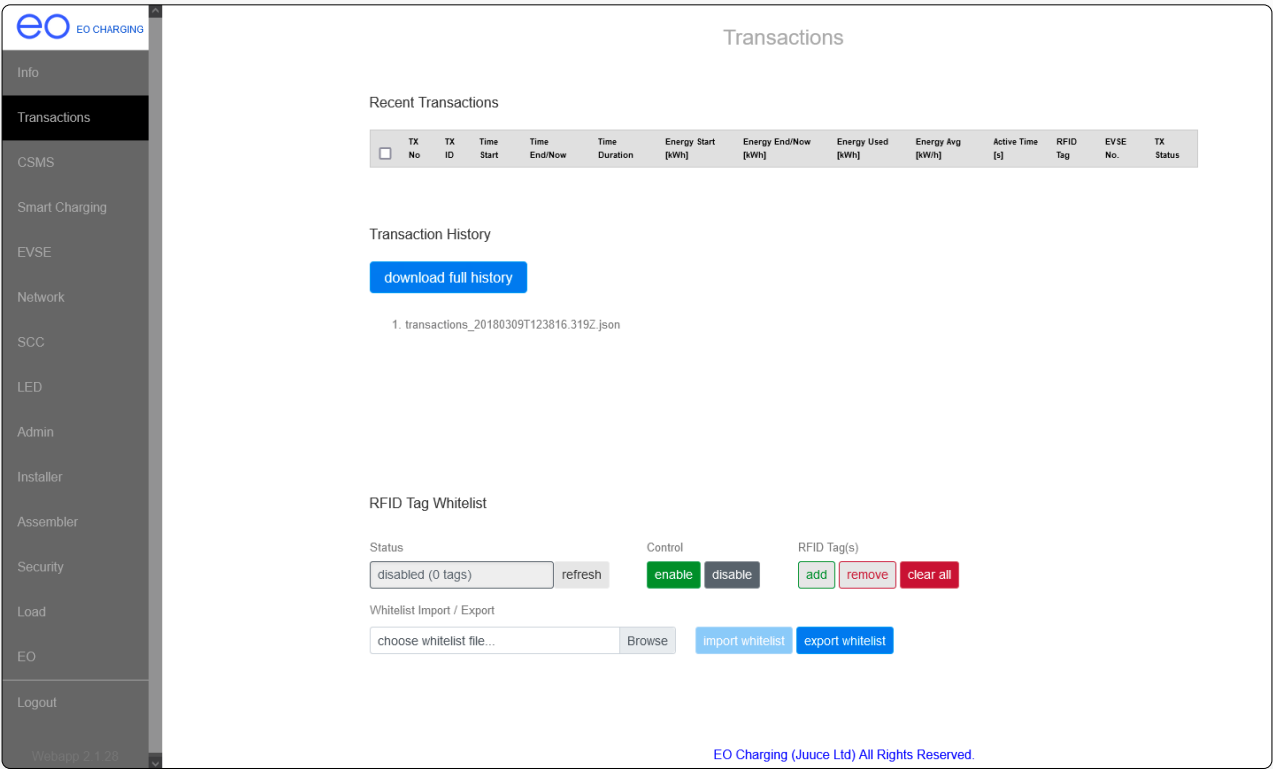


Figure 15: Transactions page. RFID only applicable to the EO Genius 2.

- 1. Transaction history.
 - a. Here it is possible to see historic charging sessions and how much energy was drawn and for how long during the session.



5.3 CSMS

The screenshot displays the CSMS configuration interface. On the left is a sidebar menu with options: Info, Transactions, CSMS (selected), Smart Charging, EVSE, Network, SCC, LED, Admin, Installer, Assembler, Security, Load, EO, and Logout. The main content area is titled 'CSMS' and is divided into two sections: 'Status' and 'Settings'.

Status Section:

- CSMS Connection Status: **connected**
- Bytes Sent [B]: 2843
- Charger Model: EM301-DCL-PME
- SCC Version: 1.17.4
- Bytes Received [B]: 1718
- Charger Vendor: EO Charging Ltd

Settings Section:

- CSMS endpoint URL: **wss://ocpp.ev.energy:443**
- Charger Identity: **eo-022301049244204380**
- Authorisation Strategy: ☒ Remote via OCPP
- Default Id Tag mode: ☒ Default Id Tag used. No Authorisation Required
- Sound Notification: ☒ Sound Disabled
- Default Id Tag (Default Id Tag mode only): **default**
- RFID Enabled: ☒ RFID Disabled

A 'Save' button is located at the bottom of the settings section. At the bottom right of the page, it says 'EO Charging (Juice Ltd) All Rights Reserved.'

Figure 16: CSMS page.

By default the charging station is configured to connect to the EO Cloud. **This must be changed by the installer to point to ev.energy**, the following fields should be modified:

- + Authorisation Strategy – Local or Remote by OCPP server.
- + Default ID Tag mode– requires authorisation by the cloud before starting.
- + Default ID Tag – value sent up in Start Transaction message.
- + CSMS URL – This must be replaced to point the charger to ev.energy. Replace CSMS URL with:
 - **wss://ocpp.ev.energy:443**
- + Charger Identity – the OCPP ID required by the server.

5.3.1 RFID OPERATION

There are various options available for RFID which are only applicable to the EO Genius 2.



5.4 SMART CHARGING PROFILES

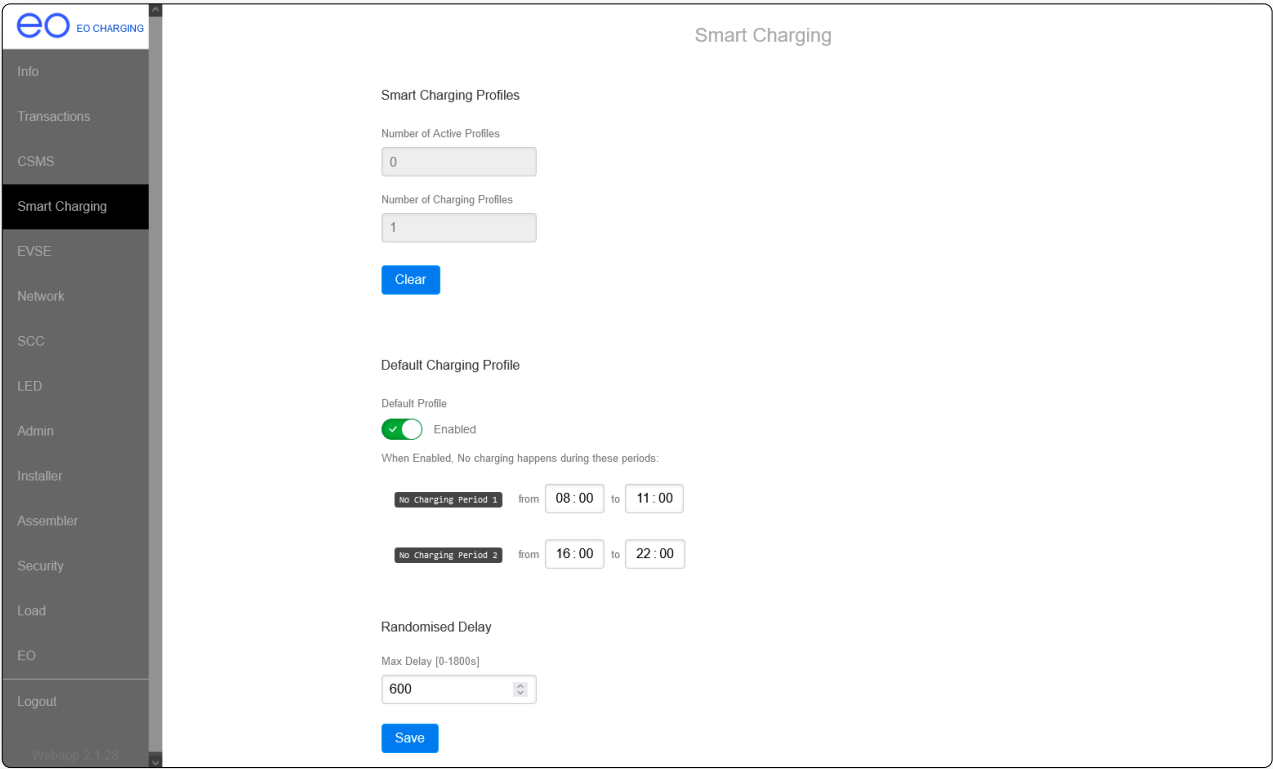


Figure 17: Smart charging page.

By default, the charging station is programmed with a default charging schedule and a random delay in accordance with the UK Smart Charging Regulations. It is important the units are handed over to the customer with both of these features enabled.

The profiles defined are OCPP Smart Charging Profiles and so can be overridden by the OCPP Server.



5.5 EVSE

eoEO CHARGING

Info

Transactions

CSMS

Smart Charging

EVSE

Network

SCC

LED

Admin

Installer

Assembler

Security

Load

EO

Logout

Webapp 2.1.20

EVSE

Number of EVSEs

1

Save

Force Charger Availability

Inoperative

Operative

EVSE 1

Availability

Operative

Firmware Version

4702020

MID Meter Type

SDM72D-M

Product ID

131077

Vendor ID

268566526

Tethered

☒ with Socket

EVSE ID

1

MID Meter Serial Number

01020304

Number of Connectors

1

Serial Number

00 00 00 00 00 00 02 20 39 03 81 64 20 26 41

Voltage [V]

230

EO Charging (Juuce Ltd) All Rights Reserved.

Figure 18: EVSE page.

The page contains detailed information about the firmware and configuration of the charging station. The only installer and customer actionable item is to change the ocpp. Available status of the charger:

- + Available
- + Unavailable



5.6 NETWORK

eo EO CHARGING

Info

Transactions

CSMS

Smart Charging

EVSE

Network

SCC

LED

Admin

Installer

Assembler

Security

Load

EO

Logout

Webapp: 2.1.20

Network

Ethernet

Status

up

IP Address

10.49.48.132

DNS Address

10.49.254.250

save

reload

DHCP

Dynamic

Gateway Address

10.49.48.250

WiFi

WiFi Status

down

Refresh List

Use as WiFi SSID

WiFi Mode

normal

WiFi

Enabled

WiFi SSID

Assembler

WiFi PSK

show

DHCP

Dynamic

WiFi INET / SUBNET

WiFi Gateway

WiFi DNS

Ad-hoc

Enabled

Ad-hoc Timeout [120-1800s]

600

Ad-hoc SSID

eo-021260097633201829

Ad-hoc PSK

show

Ad-hoc LinkLocal

Disabled

Ad-hoc INET / NETMASK

10.10.10.1/8

save

save + connect

Modem

ICCID

89883040000025337341

IMSI

206018131523734

IMEI

865456053292080

COPS

Automatic, O2 - UK, User-specified GSM access technology

RSSI [dBm]

-60

SIM Status

SIM OK

IP

10.111.38.255

PING IP

8.8.8.8

PING Test

successful

restart modem (interface + service)

refresh modem info

APN

wlapn.com

Username

JUUCELIM

Password

show

save

Figure 19: Network page.

EOCHARGING.COM

19

This page contains three primary sections:

- + Ethernet
- + Wi-Fi
- + GSM

5.6.1 ETHERNET

Ethernet

Status

up

IP Address

10.49.48.132

DNS Address

10.49.254.250

DHCP

☒ Dynamic

Gateway Address

10.49.48.250

save

reload

Figure 20: Ethernet settings.

By default the ethernet port is enabled and set up for dynamic DHCP. If a static IP address is required then the DHCP switch should be set to Static and then IP address details should be entered.



5.6.2 WI-FI + ADHOC

The Wi-Fi device on the charging station operates in two modes:

- + Adhoc – configuration settings for the Wi-Fi hotspot. DO NOT modify these settings as it can cause the unit to power up without a Wi-Fi hotspot. If this happens then the only recovery route is to connect the charging station to a router using an ethernet cable.
- + Wi-Fi – the settings used to join the charging station to a local Wi-Fi network.

The screenshot shows a web-based configuration interface for Wi-Fi and Ad-hoc settings. The interface is organized into two columns. The left column contains settings for both Wi-Fi and Ad-hoc modes, while the right column contains settings specific to the selected mode. The Wi-Fi status is currently 'down'. The Wi-Fi mode is set to 'normal'. The Wi-Fi SSID is 'Assembler' and the Wi-Fi PSK is masked. The DHCP is set to 'Dynamic'. The Ad-hoc mode is also 'Enabled'. The Ad-hoc timeout is set to 600 seconds. The Ad-hoc PSK is masked. The Ad-hoc LinkLocal is 'Disabled'. The Ad-hoc SSID is 'eo-021260097633201829' and the Ad-hoc INET / NETMASK is '10.10.10.1/8'. Buttons for 'save' and 'save + connect' are at the bottom.

Figure 21: Wi-Fi settings.

In order to view the list of available Wi-Fi networks, then click on the “Refresh List” button. This will show the list of available networks and their associated signal strengths. Select the chosen network and then click on the “use as Wi-Fi SSID” button. This will then populate the “Wi-Fi SSID” text field allowing the installer to enter the Wi-Fi password into the Wi-Fi PSK field. Again static Wi-Fi details can be used if so desired.



5.6.3 GSM

Modem

ICCID: 89883040000025337341

IMSI: 206018131523734

IMEI: 865456053292080

COPS: Automatic, O2 - UK, User-specified GSM access technology

RSSI [dBm]: -60

SIM Status: SIM OK

IP: 10.111.38.255

PING IP: 8.8.8.8

PING Test: successful

restart modem (interface + service) refresh modem info

APN: wlapn.com

Username: JUUCELIM

Password: show ☐

save

Figure 22: Modem settings.

There are three settings that the installer can enter:

- + APN URL
- + Username
- + Password

The GSM functionality works in two modes:

- + Primary – when the charging station powers up it then checks for an active Wi-Fi or ethernet connection. If neither are present then the charging station will connect to the OCPP server using the GSM as the primary connection route.
- + Backup – if an ethernet or active Wi-Fi connection is present then the GSM will act as a backup. After 20min of no connection from the Wi-Fi / ethernet then the device will swap over to GSM.



5.7 SCC

This page shows any errors that are present in the system. This can be useful in diagnosing an issue with the charging station in the case of a fault. The EO team may request these data logs in the event of a charger malfunction.

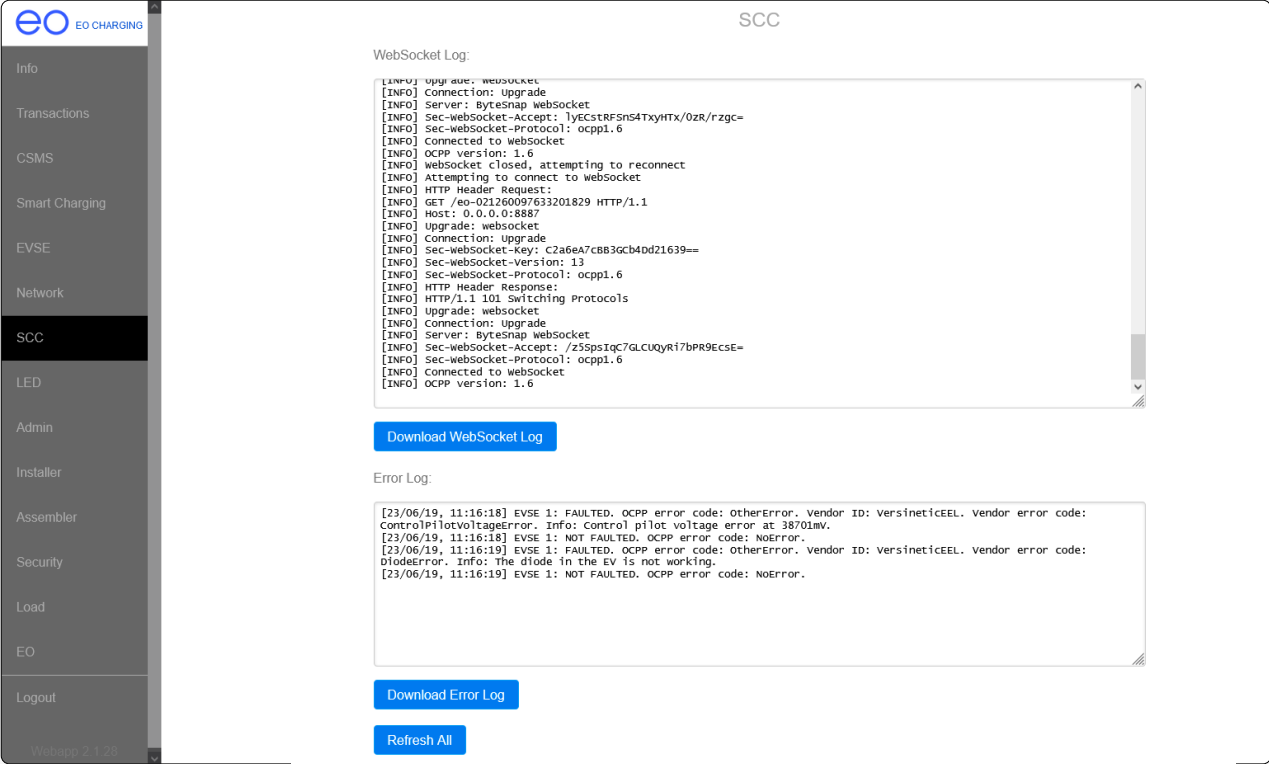


Figure 23: SCC page.

5.8 ADMIN

This page details a number of important support functions.

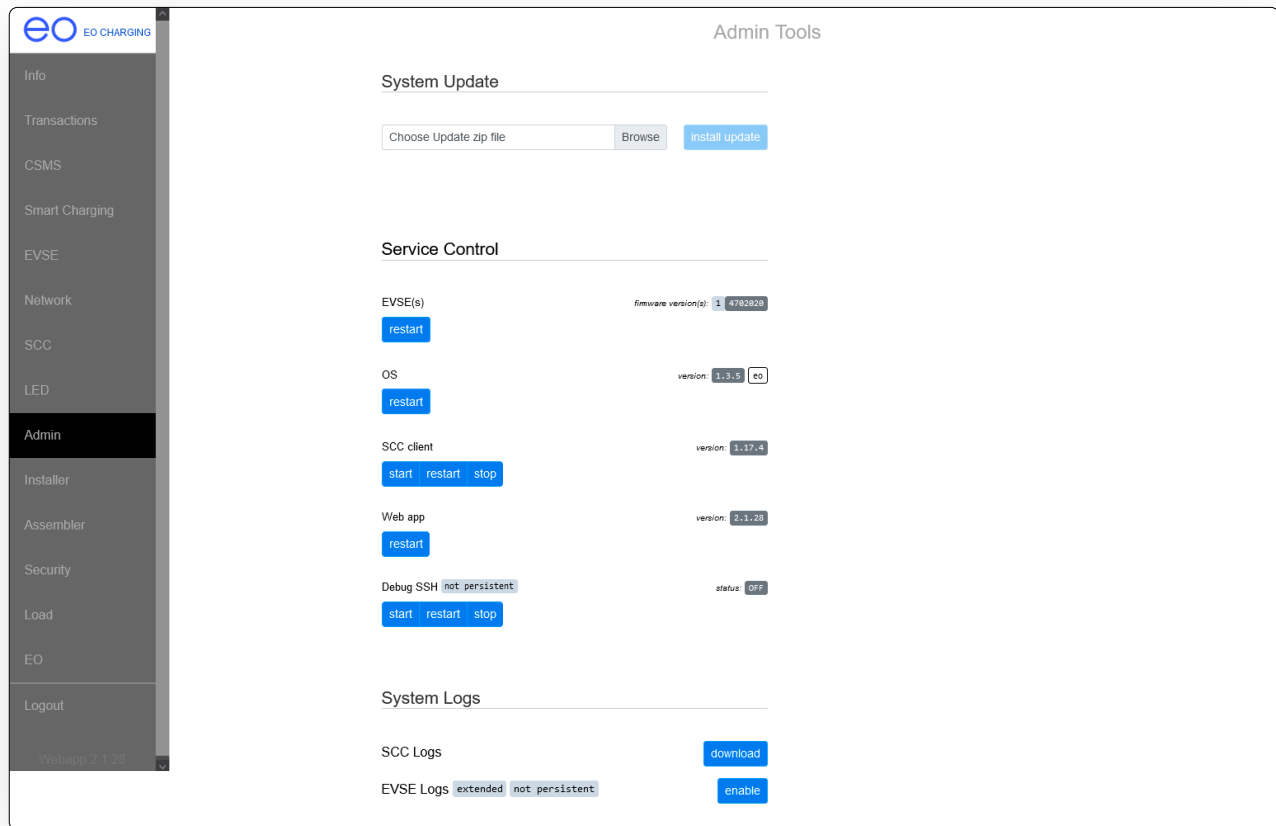


Figure 24: Admin tools page.

These items may be requested by support in the event of a fault:

- + System Update – support may provide the new firmware image which can then be uploaded to the charging station.
- + OS Firmware Version – e.g. 1.3.5 in the above image.
- + OS Restart – reboot the charger which takes roughly 2 min to complete.
- + SCC Logs – download the diagnostic logs. These can be analysed offline or sent to Support for analysis in the event of a fault.



5.9 INSTALLER

This page details a number of important support functions.

eo EO CHARGING

Info

Transactions

CSMS

Smart Charging

EVSE

Network

SCC

LED

Admin

Installer

Assembler

Security

Load

EO

Logout

Webpage 2.1.25

Installer Settings

Charger Settings

Timezone

(UTC+00:00) Dublin, Edinburgh, Lisbon, London

Save Timezone

Charger Current Limit [6 - 63A]

32

Installer Info

Installer Name [text]

Installer Company [text]

Installer Email [email]

EVSE #1/1

Tilt/Bump Detection

Disabled

Bump Acceleration [1 - 15g]

Tilt Angle [1 - 80°]

save tilt + calibrate

Phase Settings

Installer Phase Selection

Single-Phase

Phase Connection (v1)

R (L1)

External Metering

External CT Clamps

Disabled

CT Clamps

| Clamp # | On/Off | Rating [A] | Type |
|----------|---------------|--------------|---|
| Clamp #1 | <div>On</div> | <div>1</div> | <div>Source</div> <div>Site</div> <div>Load</div> <div>external</div> |
| Clamp #2 | <div>On</div> | <div>1</div> | <div>Source</div> <div>Site</div> <div>Load</div> <div>external</div> |
| Clamp #3 | <div>On</div> | <div>1</div> | <div>Source</div> <div>Site</div> <div>Load</div> <div>external</div> |

save all configuration + calibrate

reset to default

Reading Accelerometer Probs from EVSE 1 Succeeded

Reading PEN Probs from EVSE 1 Succeeded

Reading Connector Probs from EVSE 1 Succeeded

Reading Loader Probs from EVSE 1 Succeeded

Reading CT Clamps Probs from EVSE 1 Succeeded

download

Figure 25: Installer settings page.

There are important options and fields that must be completed by the installer:

- + Timezone – set the local timezone which is important for OCPP schedules (which are sent down in UTC).
- + Charger Current Limit – the maximum current limit of the charger.
- + Installer Info – enter details of the installer so that these can be made available to the OCPP Server and hence the support team.



- + Tilt - This is a multi-stage process.
 - + Ensure that the charging station is in the final mounted position i.e. it is calibrated in situ.
 - + Enter the details – Bump=2 and Tilt=10
 - + Click “Save tilt + calibrate”
 - + Note – when the “Save tilt + calibrate” button is pressed then this will remove any other unsaved information on the page. So double-check that the other installation is saved before pressing this button.

- + CT Clamps - If any CT clamps are being used then the following must be enabled:
 - + External CT Clamps Enabled - Yes / No
 - + Ct Clamp 1
 - + Enabled Yes / No
 - + Rating e.g. 100A
 - + Location – Source (e.g. output of inverter) / Site (e.g. output of site meter)
 - + Ct Clamp 2
 - + Enabled Yes / No
 - + Rating e.g. 100A
 - + Location – Source (e.g. output of inverter) / Site (e.g. output of site meter)



5.10 LOAD

The load page works in conjunction with the CT Clamp settings on the installer page to set up load management functionality of the charger. The system is highly flexible and therefore there are a number of load management options available:

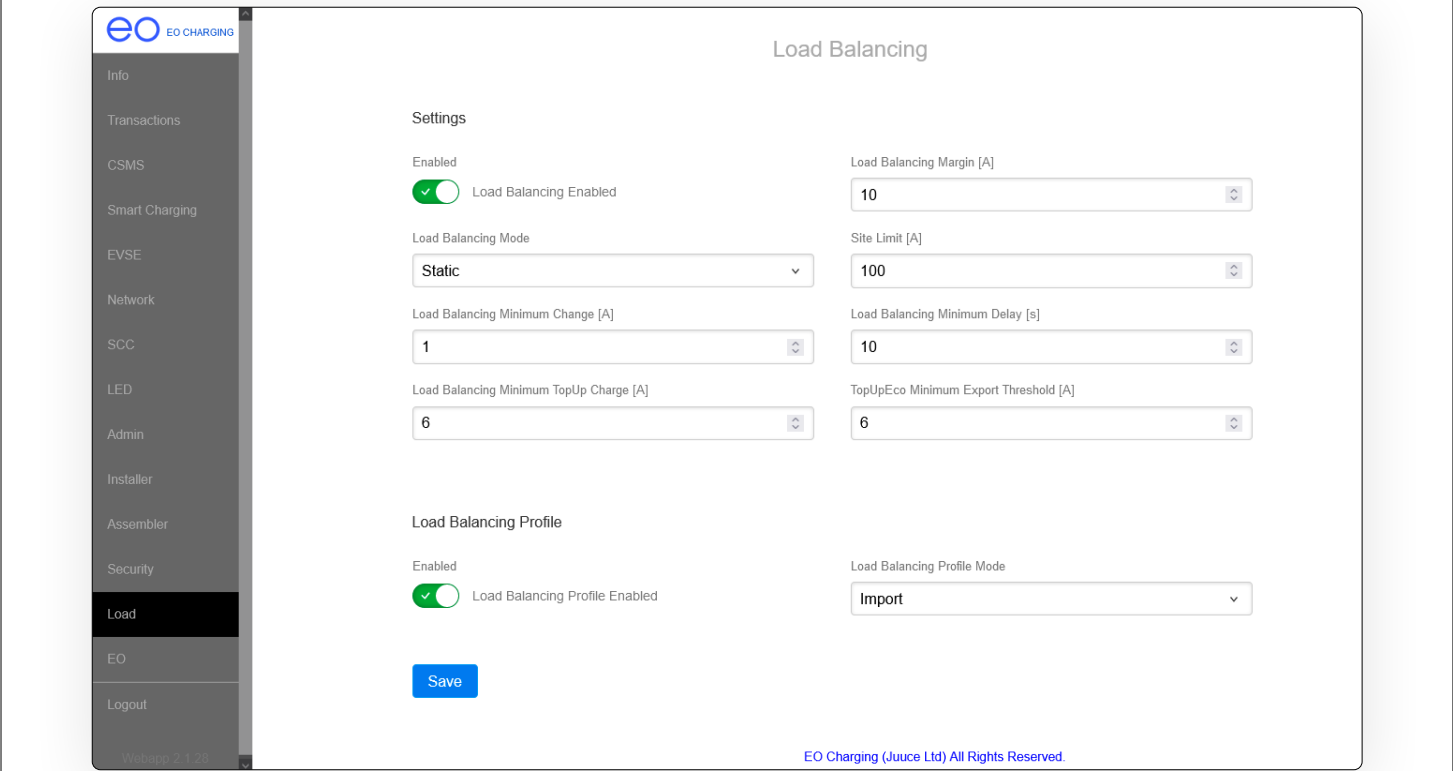


Figure 26: Load balancing page.

| Setting | Recommended Value | Notes |
|-----------------------|---|--|
| Enabled | Yes | Turns on or off Load Balancing. |
| Load balancing mode | Dynamic | The permanent load management mode. To turn off load management then select Static. |
| Site Limit | X Amps e.g. 60Amps or 80Amps or 100Amps | The limit of the site. |
| Load balancing margin | 10% of the Site limit in Amps | A safety margin for the load management algorithm. For example if the site limit is 100A then the Load Balancing Margin should be set to 10Amps. |

| | | |
|-------------------------------|-------|---|
| Load Balancing Minimum Change | 1Amp | The amount by which the site/import CT Clamp reading must change by before the charging station will react to the change. For example if the Load Balancing Minimum Change is set to 1A then the load management won't react if the CT reading changes by 0.1Amp. However, it will react if the CT reading changes by 1.1Amp. |
| Load Balancing Minimum Delay | 10sec | The time between changes to the advertised rate of available power to the vehicle. |
| Load Balancing Minimum Top Up | 6A | The minimum rate of charge to be used in TopUp or TopUpEco mode. |
| TopUpEco Minimum Threshold | 3A | The amount of export required before the charging station will start charging in solar mode. |

5.10.1 ENABLED DIFFERENT MODES BY USING PROFILES

If the customer wants to select different schedules at different times using the ev.energy App, then the following configuration options should be set by the installer.

Load Balancing Profile

EnabledLoad Balancing Profile Enabled

Save

Load Balancing Profile Mode

Import

Figure 27: Load balancing profile settings.

| Setting | Recommended Value | Notes |
|-----------------------------|-------------------|--|
| Enabled | Yes | Turns on or off the ability to control the different modes by the ev.energy App. |
| Load Balancing Profile Mode | Import | The default solar mode which is used by the charging station when a solar schedule is selected by the ev.energy App. |



5.11 SOLAR

It is possible to set up the Mini Pro 3 to allow the charging stations to work in a number of solar modes:

| Setting | Net Zero | Solar Matching |
|--------------------------|--|--|
| Description | The excess solar of the house is imported directly into the vehicle. | The vehicle is set to charge at the same rate as the output of the solar inverted. |
| Location of the CT Clamp | Output of the site meter. | Output of the Solar Inverter. |
| Example | <ul style="list-style-type: none"> + Solar is generating 10 Amps of solar + The house is consuming 2 Amps + The vehicle will be set to charge at 8 Amps + No power is imported from the Grid | <ul style="list-style-type: none"> + Solar is generating 10Amps + The house is consuming 6 Amps + The vehicle is set to charge at 10 Amps + 6 Amps is imported from the grid |
| Notes | The vehicle will only start to charge in this mode when the site is exporting more than the vehicle's minimum charging rate which is 6 Amps. | All house consumption will be imported from the grid in this mode. |

It is possible to set up the charging stations to work in the following modes:

1. Permanent Solar Mode.

- a. The device is permanently in solar mode (Net Zero or Solar Matching).
 - I. Import – the charging rate matches the output of the solar inverter or the total export of the site.
 - II. TopUp – the charging rate of the vehicle is set to a minimum value of 6A which is then increased if the solar export is greater than 6A.
 - III. TopUpEco – the same as TopUp but the starting threshold is not 6Amps but can be configurable.

2. Solar + Load Management.

- a. The customer can set up the device using the ev.energy app so that the charging station can charge on full power or on solar e.g.
 - I. Full Power – 00:00 to 04:00
 - II. Solar – 10:00 to 15:00



5.11.1 RECOMMENDED CONFIGURATIONS

| CT1 | CT2 | Load Management Mode | Load Balancing Profile Enabled | Load Balancing Profile Mode | Operation |
|-----------------------------------|--------|----------------------|--------------------------------|-----------------------------|--|
| Not connected (NC) | NC | Static | False | n/a | n/a |
| Site (output of site meter) | NC | Dynamic | False | n/a | Load management at the site import limit |
| Source (output of solar inverter) | NC | Import | False | n/a | Permanent Solar Matching Mode |
| Site | NC | TopUp / TopUp Eco | False | n/a | Permanently set up to charge in top up mode i.e. dependent on export of power from site |
| Site | NC | Dynamic | True | Import | Net Zero Mode |
| Site | NC | Dynamic | True | TopUp/ TopUpEco | Advanced solar modes |
| Site | Source | Dynamic | True | Import/ TopUp/ TopUpEco | Net zero mode but the current output of the solar inverter is shown on the Info page. This is a useful piece of information/ diagnostic tool |



→ 6.0 OTHER

6.1 FIRMWARE UPDATE

It is possible to upgrade the firmware of the charging station through two mechanisms:

1. Through the OCPP server.
2. Through the Admin Page of the web interface.

When the EO Mini Pro 3 connects to the CSMS then the CSMS will automatically upgrade the unit to the latest firmware version.

6.2 PEN FAULT DETECTION

The PME variants of the EO Mini Pro 3 have inbuilt PEN fault detection. There are no configuration options required for this feature and it continually operates whilst the unit is powered on.

If the charging station is fitted with the PEN Fault Detection system (model designator - PME), then the charging station will detect errors in the incoming grid connection. If a PEN fault is detected then the vehicle will be fully isolated from the charging station and the LED shall illuminate solid RED. It shall not be possible to charge a vehicle in this condition. In order to restart charging:

- + The vehicle must be unplugged from the charging station.
- + The charging station must be power cycled or remotely reset.
- + If the LED remains RED then the grid connection is still not within the defined safety limits and an installer must be contacted to inspect the incoming supply. If the normal pulsing Blue LED is shown then the system is safe to use.



Note: For PME variants, please make sure these are ordered at the point of purchase as cannot be retrofitted.

6.3 UK SMART CHARGING REGULATIONS

The EO Mini Pro 3 is compliant with the UK Smart Charging regulations. The charging stations comes programmed with a random delay (of 600sec/10min), a default charging schedule (no charging between 0800->1100 and 1600->2200) and an anti-tamper tilt switch in addition to the other requirements such as auto firmware update.



6.4 OFFLINE BEHAVIOUR

6.4.1 SCHEDULES

By default, the EO Mini Pro 3 will follow the last communicated schedule sent to the charging station by the OCPP server. If no schedule has been sent to the charging station by the OCPP server then the charging station will continue to operate according to any schedule set in the “Smart Charging” menu of the web interface.

6.4.2 LOAD MANAGEMENT

If Local Load management has been configured then this will continue to operate independently of the connection to the OCPP server.

6.5 DELETING CUSTOMER DATA

The only customer data that is stored by the EO Mini Pro 3 is the customer Wi-Fi details. These can be deleted by the customer logging into the web interface of the device and then removing them from the Network page.

6.6 FINDING THE DEVICE ON A LOCAL NETWORK

If the customer or the installer is logged into the same IP network as the charging station then it is possible for the web interface to be loaded by two mechanisms.

- + Entering the IP address of the charger into the search bar of the web browser.

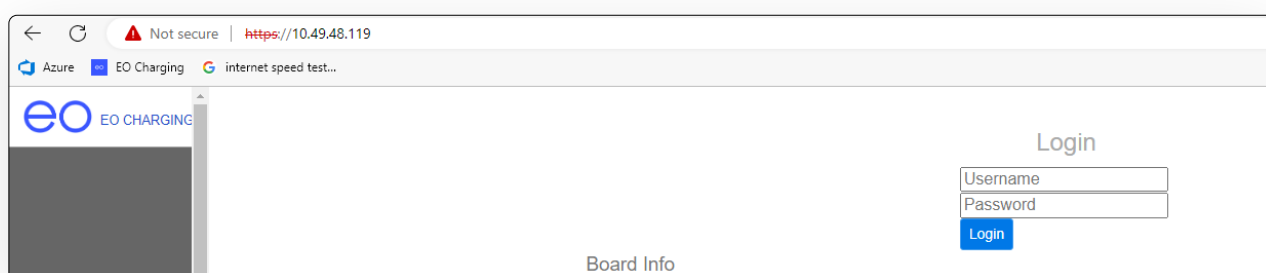


Figure 28: Installer login using IP address.

- + To find the IP address then an IP Scanning tool can be used



- + Enter the serial number of the charging station followed by .local

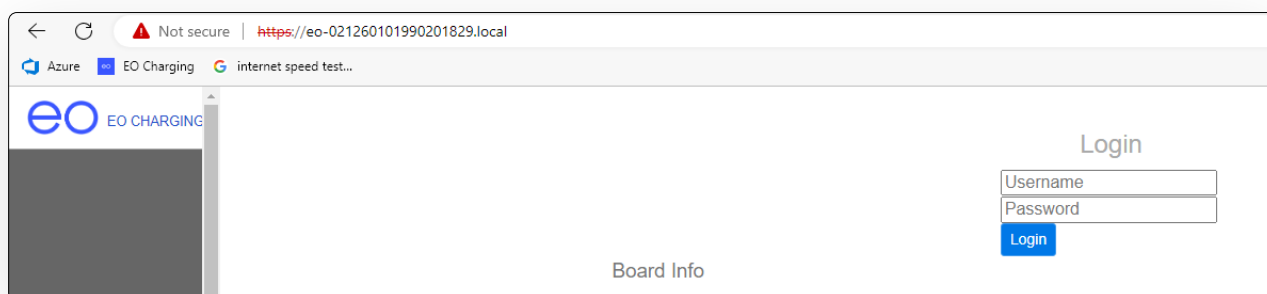


Figure 29: Installer login using charger serial number.

6.7 TEMPERATURE DERATING

The charging stations have a temperature de-rating algorithm so that the charging rate of the vehicle will be reduced if the temperatures inside the unit exceed thresholds. The charging station will start reducing the charging rate by 25% if the temperatures exceed 65°C for the EO Mini Pro 3.



→ 7.0 HINTS AND TIPS

Make use of the info page. This will indicate to the installer and the customer what the charging station is currently doing and is a good tool for fault diagnostics.

The installer should review the readings of the CT Clamps on the Info page to check the correct orientation of the CT Clamps.

The error logs on the SCC page give details of any errors shown.

In the case of an error occurring, download the diagnostic logs from the admin page as the support team will request them.



→ 8.0 CHARGING STATION SPECIFICATIONS

| Topic | Note |
|---|--|
| Characteristics of power supply input | Permanently connected to 230V |
| Characteristics of power supply output | Supplies 230V AC to the vehicle |
| Normal environmental conditions | Can be installed indoors or outdoors |
| Access requirements | Can be installed with no access restrictions |
| Mounting method | Stationary equipment intended for surface or post mounting |
| Protection against electric shock | Class I equipment |
| Charging mode | Mode 3 charging equipment |
| Ventilation during the supply of energy | Does not support ventilation during charging |
| Ingress protection | IP54 |
| Mechanical strength | IK08 |
| Operating temperature | -25°C to +50°C |
| Height of installation | The charging equipment should be mounted with the bottom face of the enclosure at least 0.9m above ground level. For tethered units, the holster height should be between 0.5m & 1.5m above ground level |
| Usage of adaptors/cord extension sets | Adaptors and conversion adaptors sets are not permitted to be used with the equipment. Cord extension sets are not permitted to be used |
| Maximum altitude | 2000m |
| Pollution degree | Pollution Degree 2 |
| Torque setting for main input cables | 1.2 Nm |
| Skill level | Operation by ordinary – Installation by skilled authorised electrician |
| Nature of Short-circuit protective device | Upstream RCD Type A required Internal: 6mA DC Leakage - internal RDC-DD as per IEC62955, PEN, LoE,LoN |



| Topic | Note |
|---|---|
| Torque setting for main chassis screws | 6Nm |
| Measures for protection against electric shock | Where the EO Mini Pro 3 includes internal 6mA DC leakage protection (DCL option), then a 30mA Type A RCD must be fitted at the supply. Otherwise, a Type B RCD or equivalent should be used. EO recommends a 40A supply for a 32A charging station. Overcurrent protection (e.g. MCB) should be installed upstream of the charging station. The internal RDC-DD is compliant to IEC 62955 |
| Short circuit protection of the charging cable | 40A Type B or Type C MCB with a maximum I _{2t} of + Socket version should be ≤ 75000 A ² s + Tethered version should be ≤ 80000 A ² s |
| Fuse rating | 3.15A, 240V time delayed cartridge fuse |
| Overvoltage category | Category 3 |
| Rated Insulation Voltage | 230V |
| Rated impulse withstand voltage U _{imp} | 4000V |
| Rated peak withstand current (I _{pk}) | ≤ 80kA ² s |
| Rated short time withstand current (I _{cw}) | N/A |
| Rated conditional short-circuit current of an ASSEMBLY (I _{cc}) | 5000A ² s |
| Electromagnetic compatibility (EMC) classification | EN 61851-21-2;2021 Residential & Non Residential EN 55032:2015 + A1:2020 Class B ENSI EN 301 489-1 V2.2.3:2019 EN 300 328 V2.2.2:2019 EMC Directive 2014/30/EU & UK Electro magnetic compatibility Regulations 2016 |
| Dimensions and weight | 230mm x 151mm x 125mm, <2kg (socketed), <5kg (tethered) |
| Storage | Dry storage location in ambient temperatures between 0°C and 30° |
| Maximum Charging Rate | 32Amps |



Important: The installer must select the RCD and earthing configuration by following the current local regulations and best practices. The installer must follow national usage guidelines to ensure the unit is installed in accordance to any local restrictions. For the UK refer to the current IET code of practice and a Type A RCD & Type B MCB are recommended.



→ 9.0 EO SUPPORT CENTRE

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

Contact us to learn more about our products. Our charging experts offer technical support and are ready to help with any questions or issues.

Live Chat: <https://www.eocharging.com/contact-us>

EO Approved installers can be found by visiting [Find an installer | EO Charging](#)



This document contains information that is subject to change without notice.

The latest version of this publication can be downloaded at:

<https://www.eocharging.com/support/home-charging/eo-mini-pro-3>



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9.1 EV.ENERGY SMARTPHONE APP SUPPORT

EO Charging has partnered with ev.energy to migrate customers to the ev.energy smartphone app to ensure the best possible charging experience with the EO Mini Pro 3.

If you have trouble downloading the ev.energy smartphone app or connecting it to your charger, please use the ev.energy live support chat or reach out via the email address below.

Live support chat: <https://support.ev.energy/en/support/home>

Email: support@ev.energy



