

# **HMI User Guide**

## **CCS2 Controller Android Application**

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This HMI user guide is intended to improve the operator's efficiency throughout the procedure and does not entirely absolve them of responsibility.

## Change Record

Rev. No.	Date	Details	Revised By	Approved By
1	27/06/2024	Initial Release	Dharmesh Basapati	Kanji Viroja
2	24/04/2025	Legal Entity Conversion: LLP to PVT LTD	Dharmesh Basapati	Kanji Viroja
3	05/05/2026	Revised Email Address	Rajkumar Patel	Kanji Viroja

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# 1 Intended Use

This user guide is a comprehensive resource for users who seek to understand and utilise the charger's Human Machine Interface (HMI).

- General Approach to HMI Operations (Section 2):
  - Begin with a description of the HMI system's purpose and function in the entire process.
  - Explain the initial screen layout and navigation features.
  - Familiarise users with basic interactions and common tasks.
- General Approach to HMI Operation Settings (Section 3):
  - Emphasis on the general operation settings.
  - Provide an exhaustive explanation of the setting options.
  - Test mode for the current state of the charging gun (gun 1 and 2).
  - Explain the charger commissioning procedures.
- Single Socket's Parameters and Operation (Section 4):
  - Emphasis on the single socket operation and session mode.
  - Highlight fault indications.
- Dual Socket's Parameters and Operation (Section 5):
  - Emphasis on the single socket operation and session mode.
  - Highlight fault indications.

WARNING!	Risk caused by inappropriate use!
	<p>Any unconventional usage or operation of the product may have unintended repercussions.</p> <ul style="list-style-type: none"> <li>• Only use the product in a conventional manner.</li> </ul>

## 1.1 Alteration and Restoration of the Product or System

To prevent risks and ensure optimal performance, no alterations, attachments, or restoration of the product are permitted without explicit authorisation of Bacancy Systems PVT LTD.

## 2 Operating Functionality and its Overview

### 2.1 Welcome

- After properly booting up the system, the welcome screen will appear on the screen. (Figure 1)

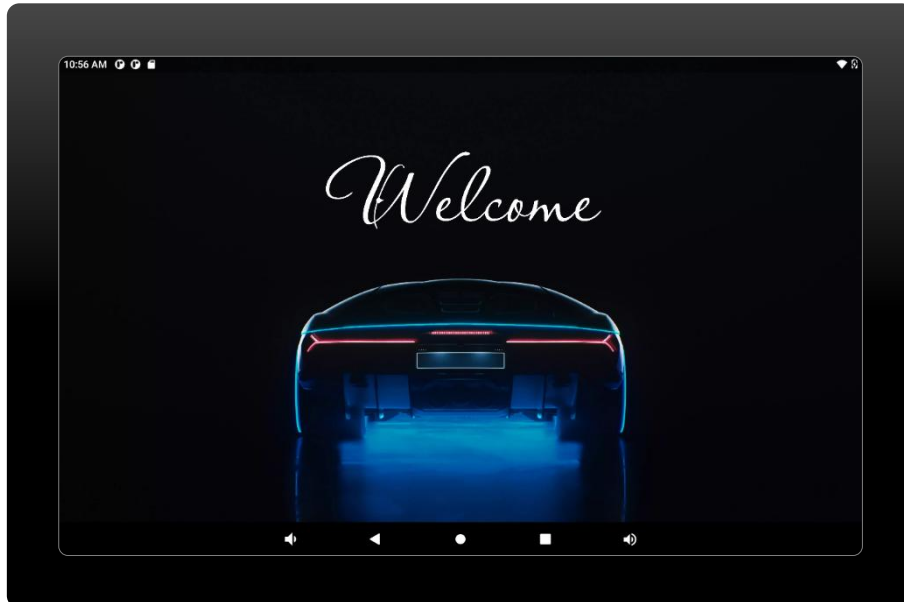


Figure 1 Welcome Screen.

### 2.2 Dashboard

- This is the dashboard screen following the welcome screen. (Figure 2)

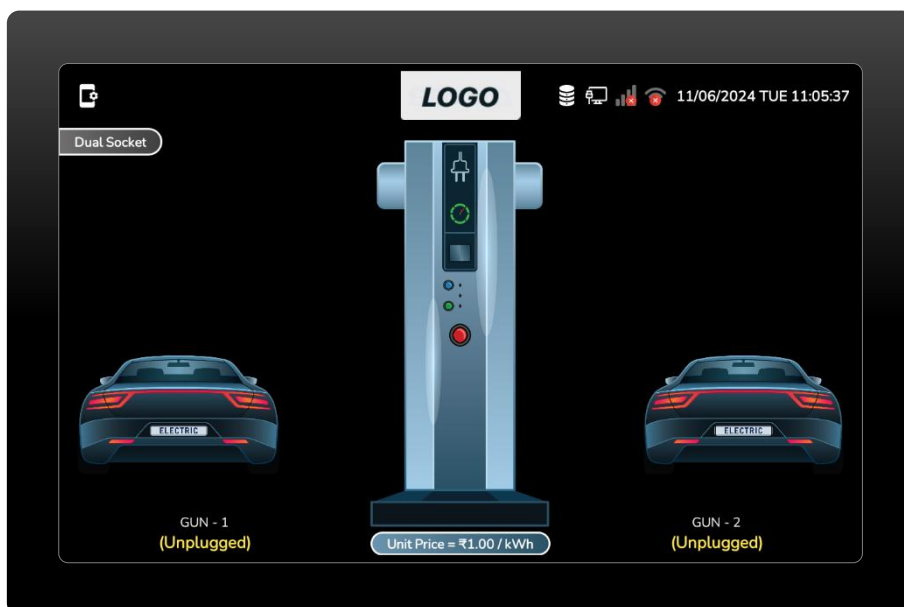
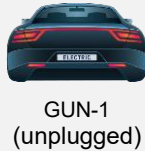

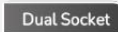

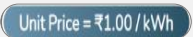


Figure 2 Dashboard Screen.

- The user should be familiarised with the icons and functionalities available when selecting a type of charger, as shown in the table below. (Table 1)





Table 1 Dashboard: Icon and Function.

No.	Icon	Name	Description
1.		GUN-1	To know the GUN-1 charging status and information screen.
2.		GUN-2	To know the GUN-2 charging status and information screen.
3.		Socket	To change a single socket to a dual socket.
4.		Logo	It is configurable as per the requirements of the company.
5.		Charging Rate	It presents a set unit price per kWh.

### 2.2.1 Notification Bar

- While using the HMI, the top of the screen will display all connections, dates, and times as briefly described in a table. (Table 2)

Table 2 Notification Bar: Icon and Function

No.	Icon	Name	Function
1.		Server	Server Connected.
2.		Ethernet	Ethernet connected.
3.		GSM / LTE Network	GSM/LTE network connected.
4.		Wi-Fi Network	Wi-Fi network connected.
5.	YYYY-MM-DD-DAY	Date	Date format. (Year-Month-Date-Day)
6.	HH:MM:SS	Time	Time format in 24 hours. (Hour : Minute : Second)

### 3 Setting

- Pressing the setting icon will open the setting menu, allowing the user to change and modify settings as required. (Figure 3)

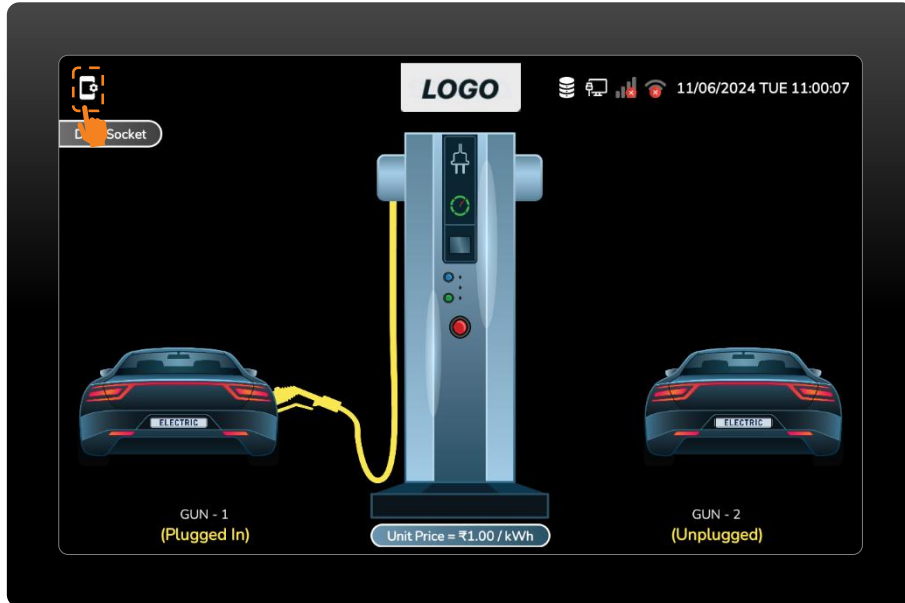


Figure 3 Dashboard Screen: Press the Setting Icon.

- To access the settings screen, the user must enter an authentic 6-digit pin. (Figure 4)

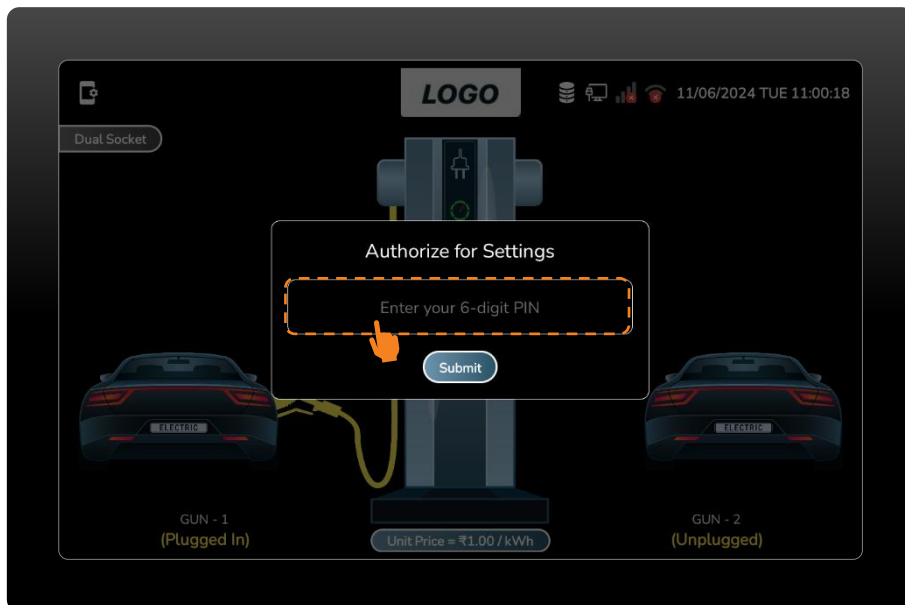


Figure 4 Authorise to Access Setting Screen.

- Enter a 6-digit pin using the onscreen keyboard, then press the submit button. (Figure 5)

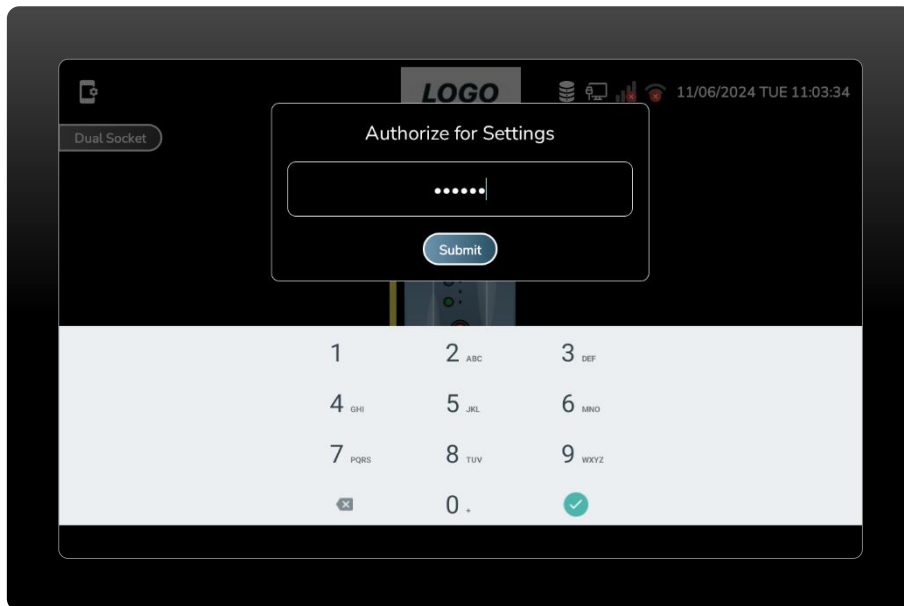


Figure 5 Enter Your 6-Digit Pin using the Onscreen Keyboard.

### 3.1 Setting Menu

- This is a setting menu with eight settings options. (Figure 6)

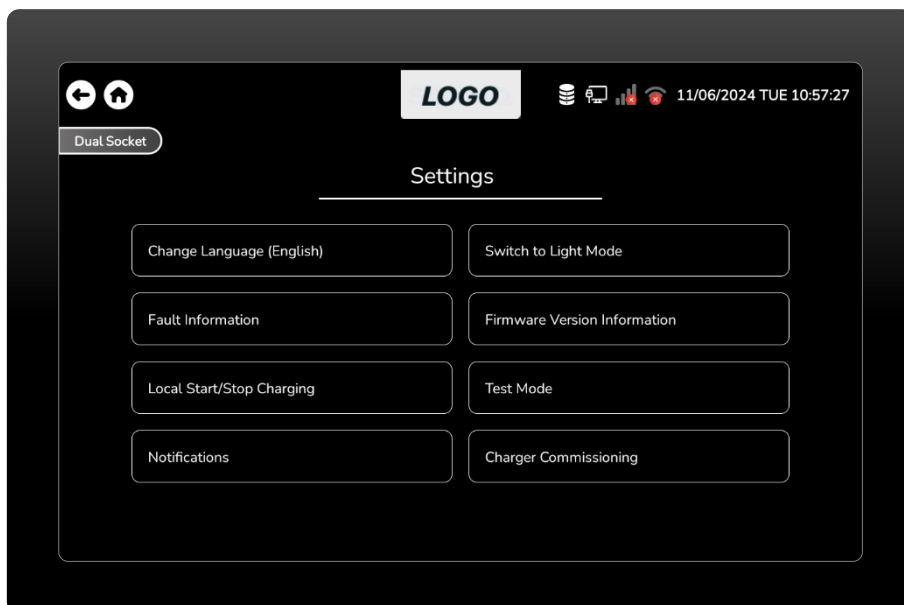


Figure 6 Setting Menu Screen.

### 3.1.1 Change Language (English)

- Pressing the "Change Language (English)" option will display a pop-up on the screen. (Figure 7)

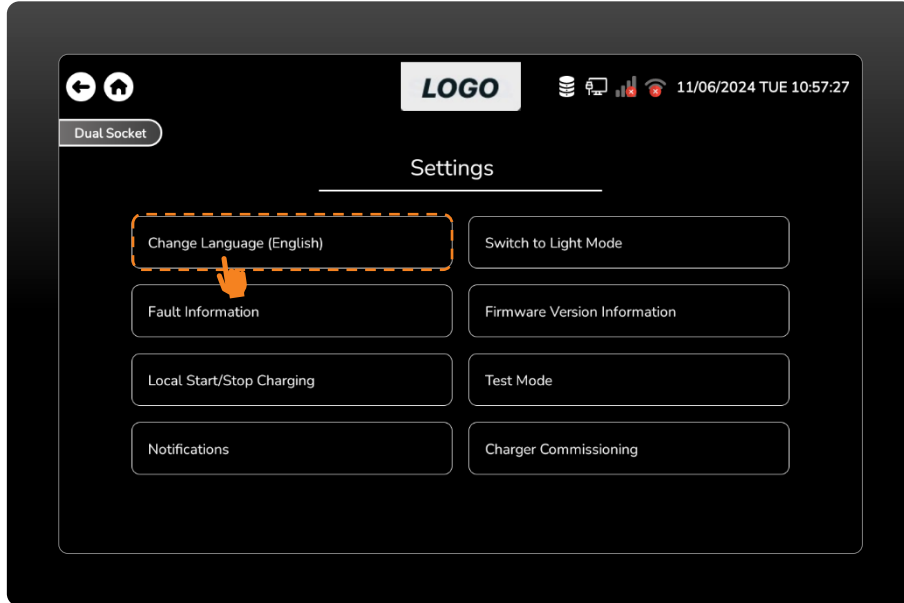


Figure 7 Press the Change Language Option.

- This is a language pop-up on the screen that allows the user to pick any language that they desire. This language modification will apply throughout the entire charging procedure. (Figure 8)

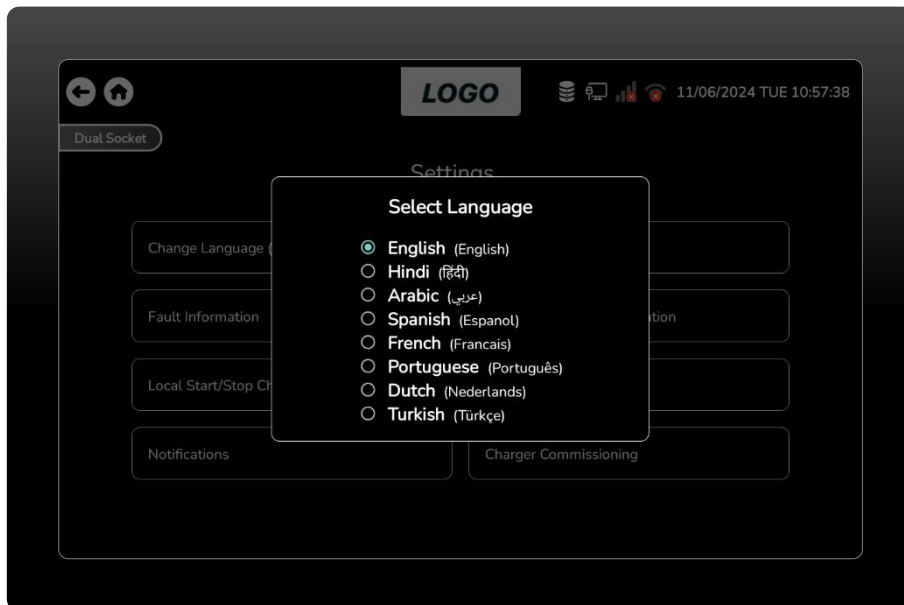


Figure 8 Language Selection Screen.

- For example, the user selected Hindi from the language selection screen. (Figure 9)

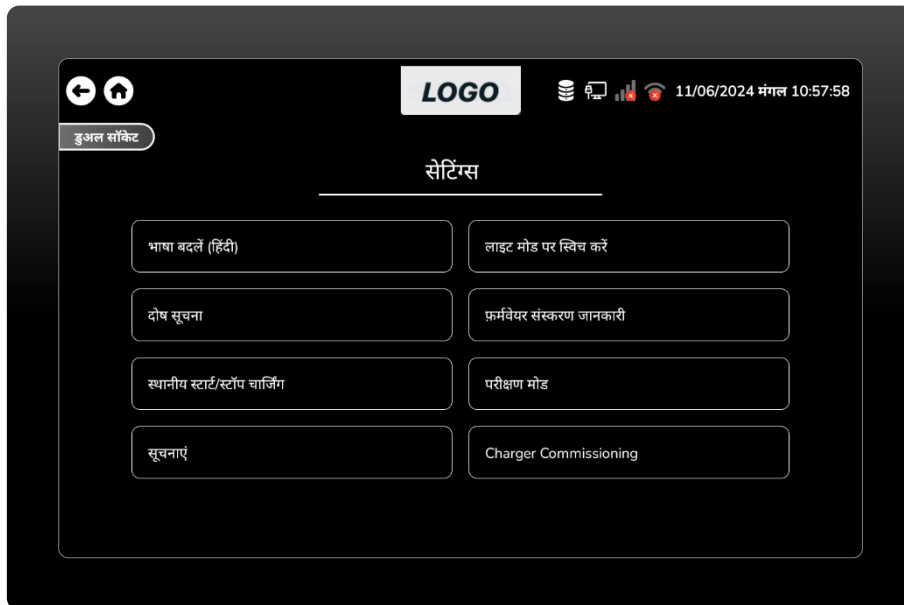


Figure 9 Language Change in Hindi.

### 3.1.2 Fault Information

- Press the "Fault Information" option. It will open the Fault Information screen, where the user can view the fault time, error description, error status, and error source. (Figure 10)

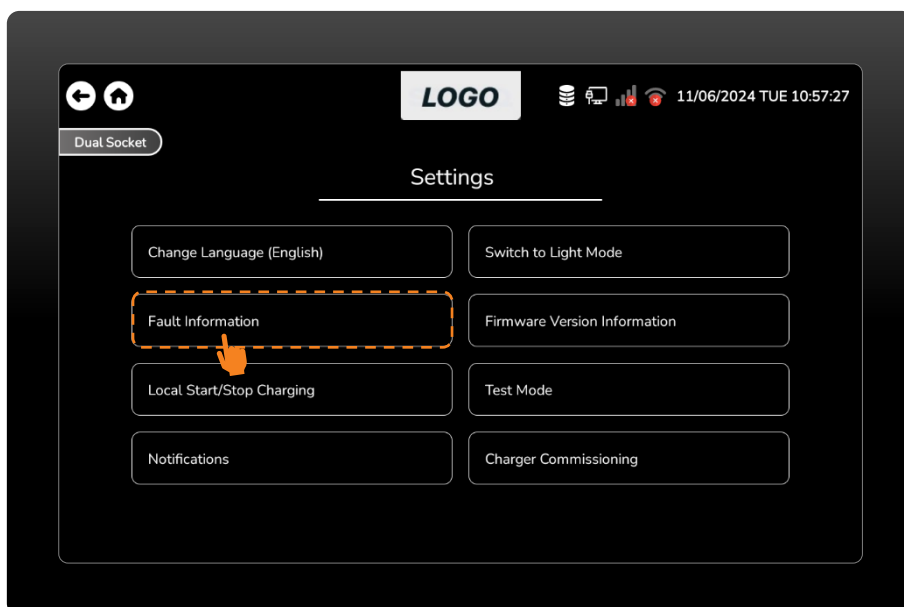


Figure 10 Press the Fault Information.

- This is a fault information screen where the user can get the error related information as shown in the below. (Figure 11)

Sr. No.	Error Time	Error description	Error Status	Error Source
1	11-06-2024 11:09:00	EMG_PRESSED	Resolved	Charger
2	11-06-2024 11:08:23	EMG_PRESSED	Occurred	Charger
3	11-06-2024 11:07:22	REC4_COMM_FAIL	Occurred	Gun 2
4	11-06-2024 11:07:22	REC3_COMM_FAIL	Occurred	Gun 2
5	11-06-2024 11:05:33	GUN_SLAC_ERROR	Resolved	Gun 1
6	11-06-2024 11:04:56	GUN_SLAC_ERROR	Occurred	Gun 1

Figure 11 Fault Information Screen.

### 3.1.3 Local Start/Stop Charging

- Press the “Local Start/Stop Charging” option. (Figure 12)

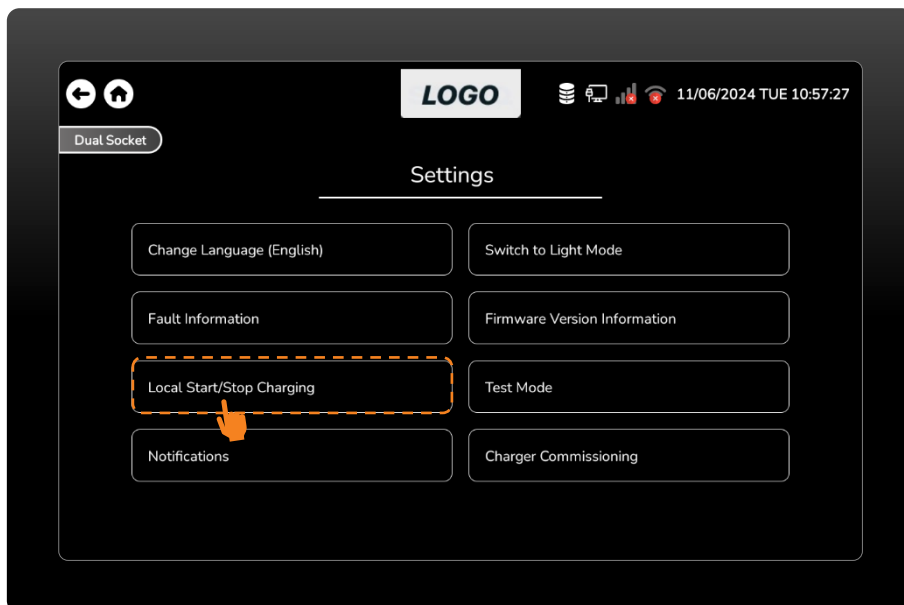


Figure 12 Press the Local Start/Stop Charging.

- This is a local start/stop charging screen that allows the user to start or stop charging from the HMI screen. (Figure 13)

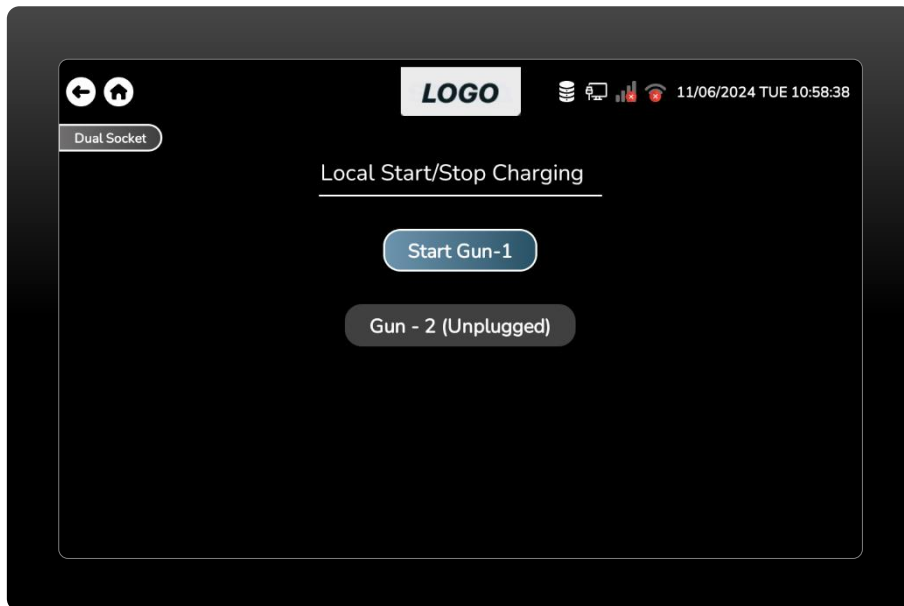


Figure 13 Local Start / Stop Charging Screen.

### 3.1.4 Notification

- Press the "Notification" option. (Figure 14)

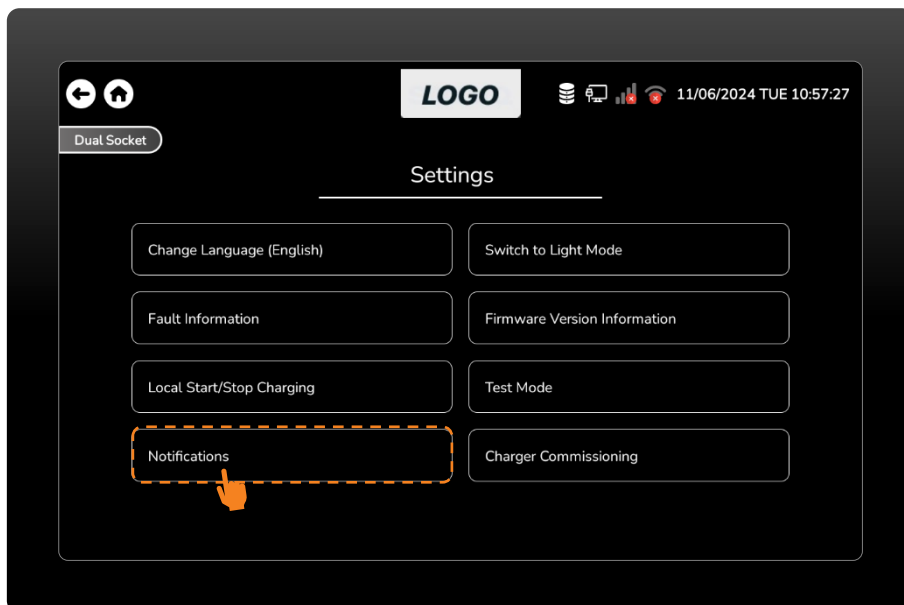


Figure 14 Press the Notifications.

- This is the notification screen, where the user can view the notification information. (Figure 15)

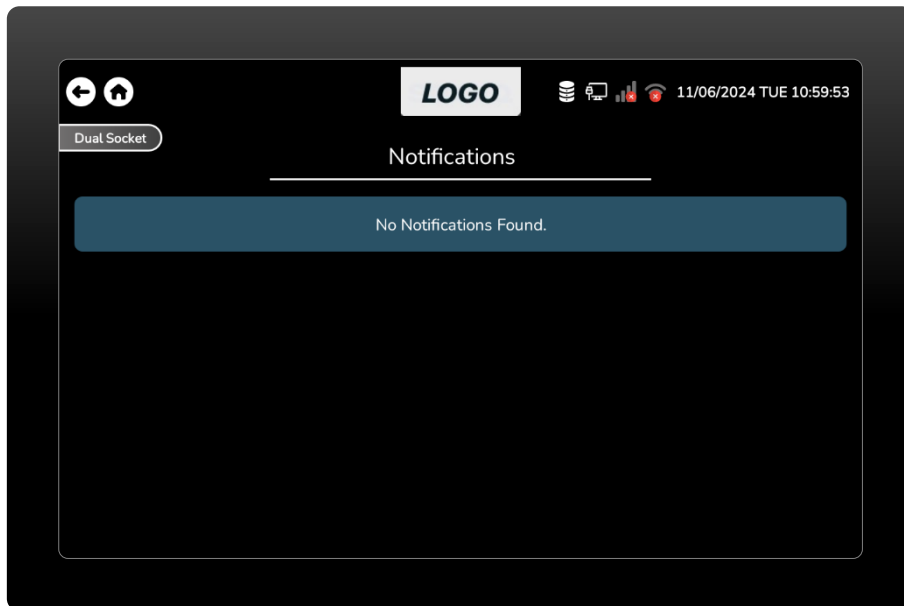


Figure 15 Notification Screen.

### 3.1.5 Switch to Light Mode

- Press the “Switch to Light Mode” option. (Figure 16)

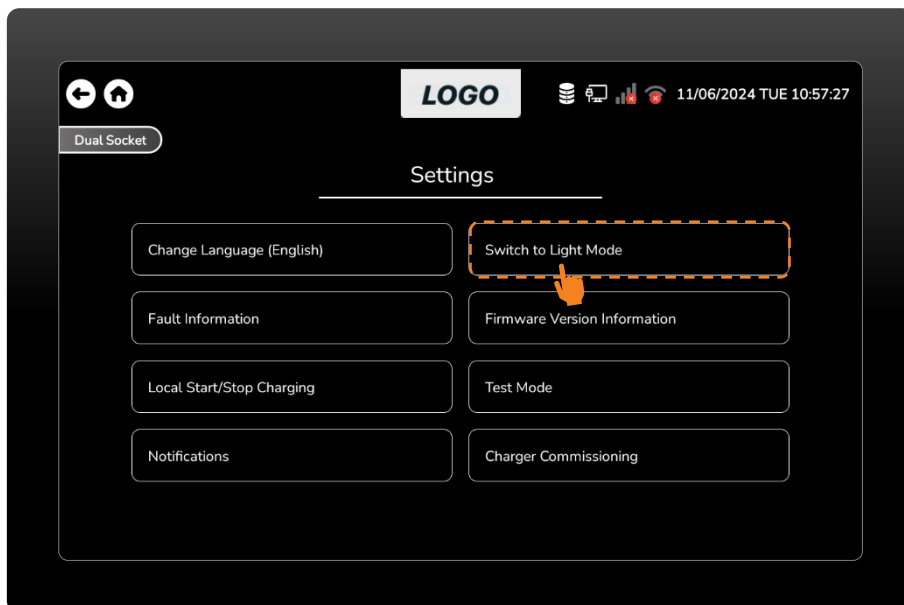


Figure 16 Press the Switch to Light Mode.

- This switch to light mode switches the user interface from dark to light mode, and vice versa. (Figure 17)

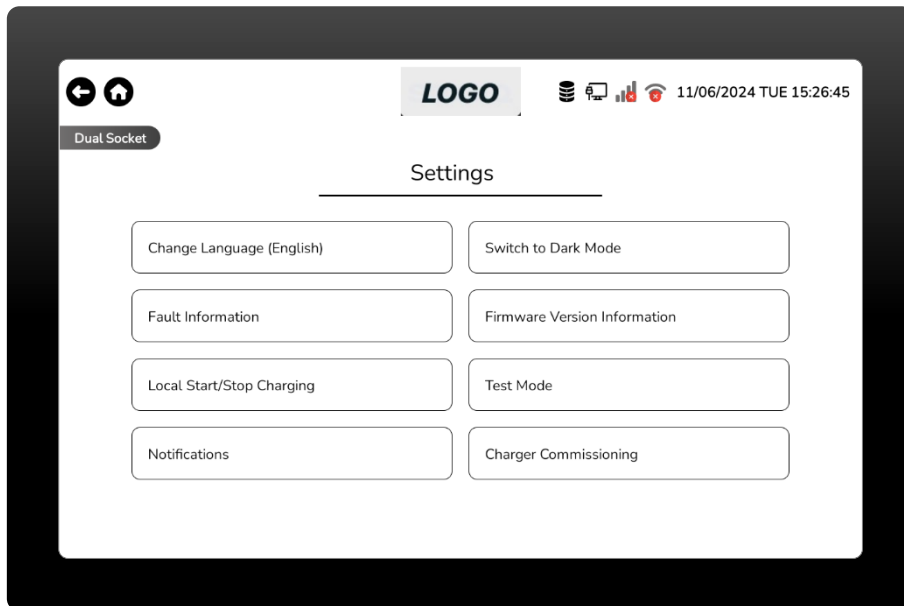


Figure 17 User Interface Switch to Light Mode.

### 3.1.6 Firmware Version

- Press the “Firmware Version Information” option. (Figure 18)

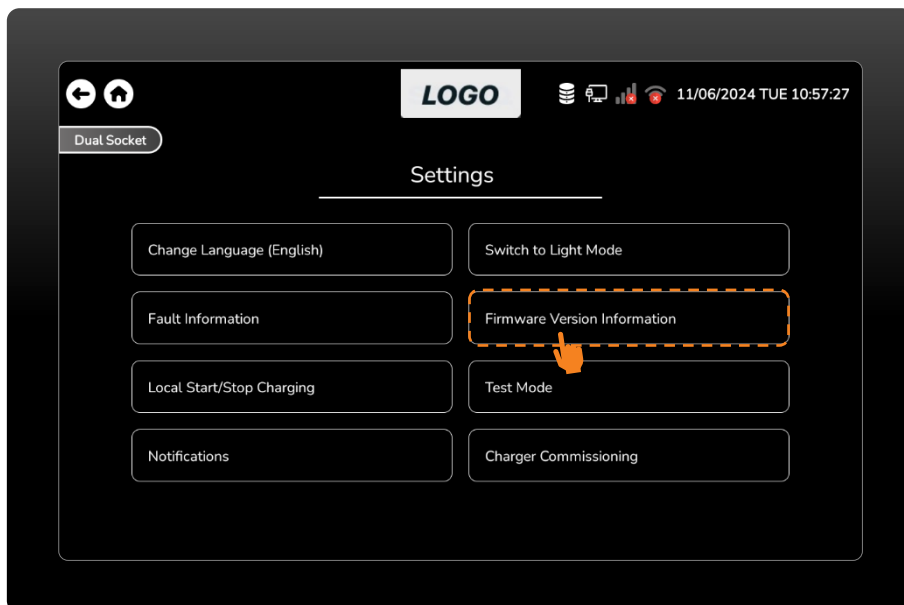


Figure 18 Press the Firmware Version Information.

- This is the firmware version information screen, where the user can find the latest firmware version for MCU, OCPP, RFID, LED, and PLC 1 and 2. (Figure 19)

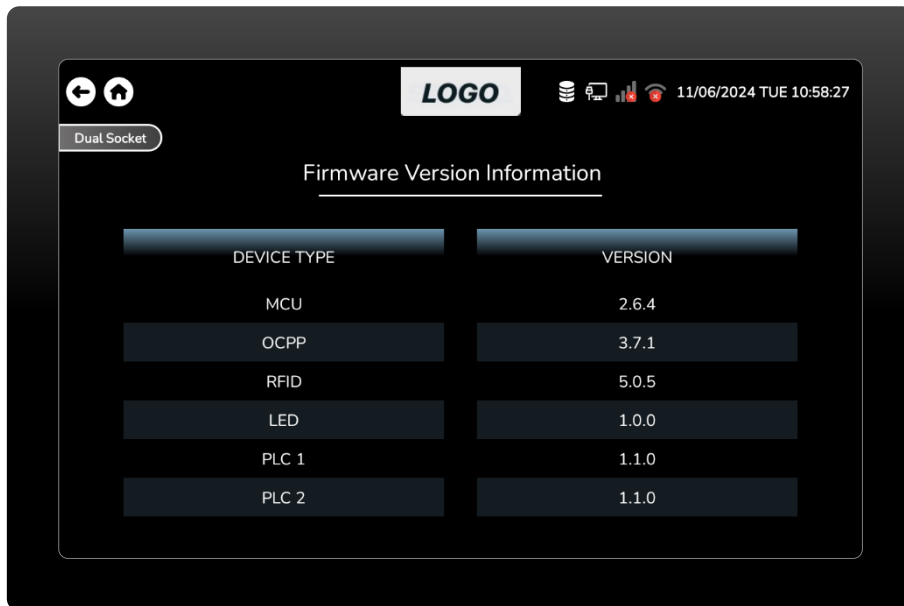


Figure 19 Firmware Version Information Screen.

### 3.1.7 Test Mode

- Press the "Test Mode" option. (Figure 20)

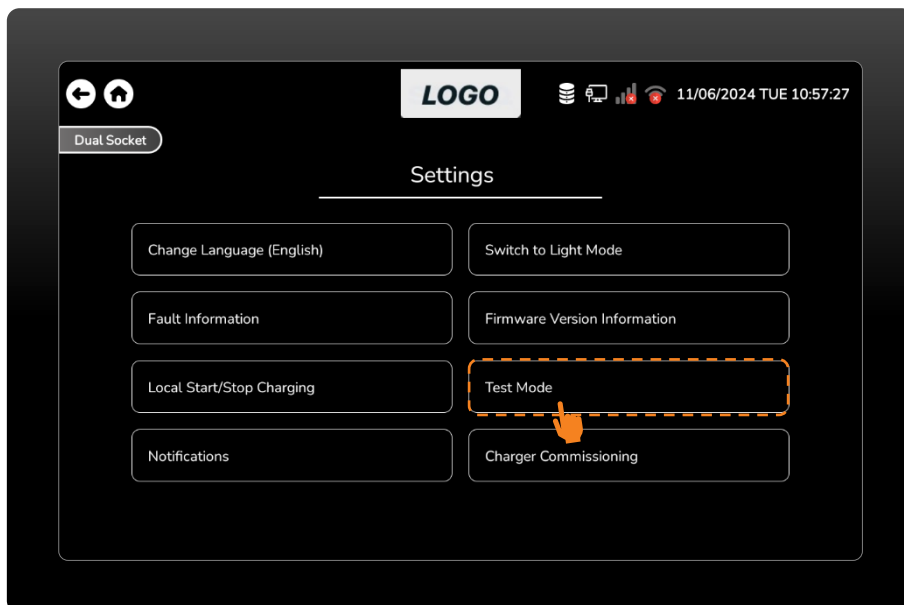


Figure 20 Press the Test Mode.

- This is the test mode screen, with two options for GUN 1 and 2. (Figure 21)

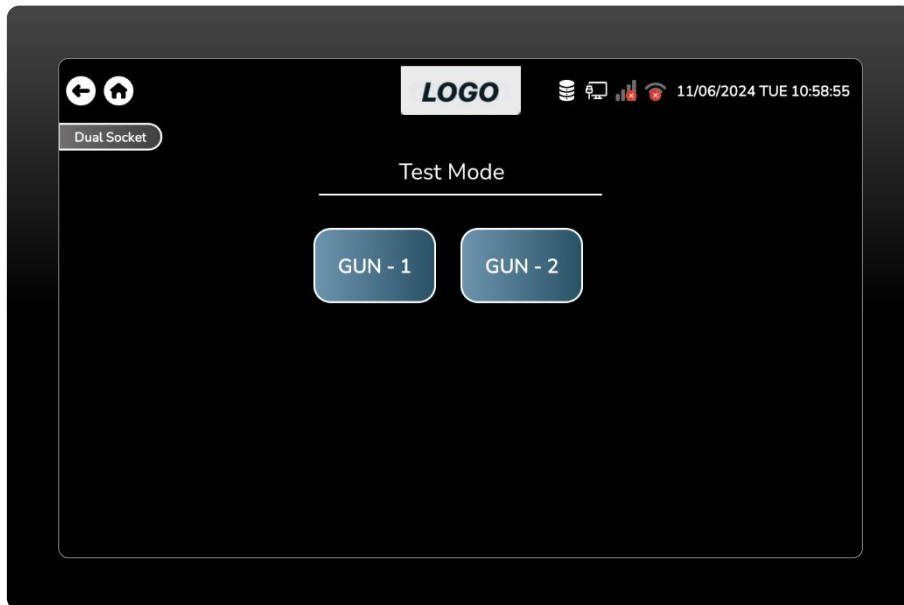


Figure 21 Test mode screen.

### 3.1.7.1 GUN-1 Test Mode

- Press the GUN-1 option from the test mode screen. (Figure 22)

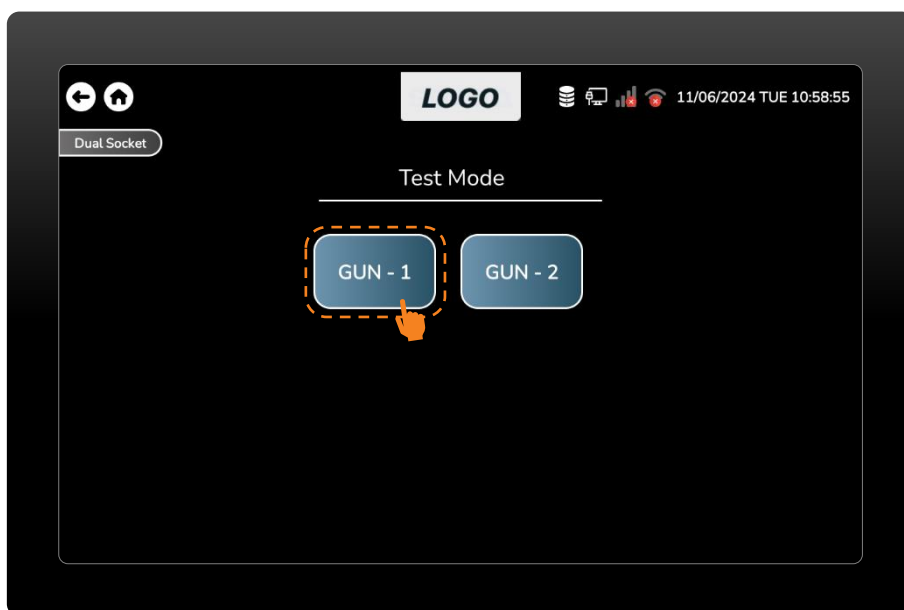


Figure 22 Press the GUN-1 option.

- This is the GUN-1 screen, where the user can test set the voltage and current within the prescribed range and then press the output on button, that will provide the charging output accordingly. (Figure 23)

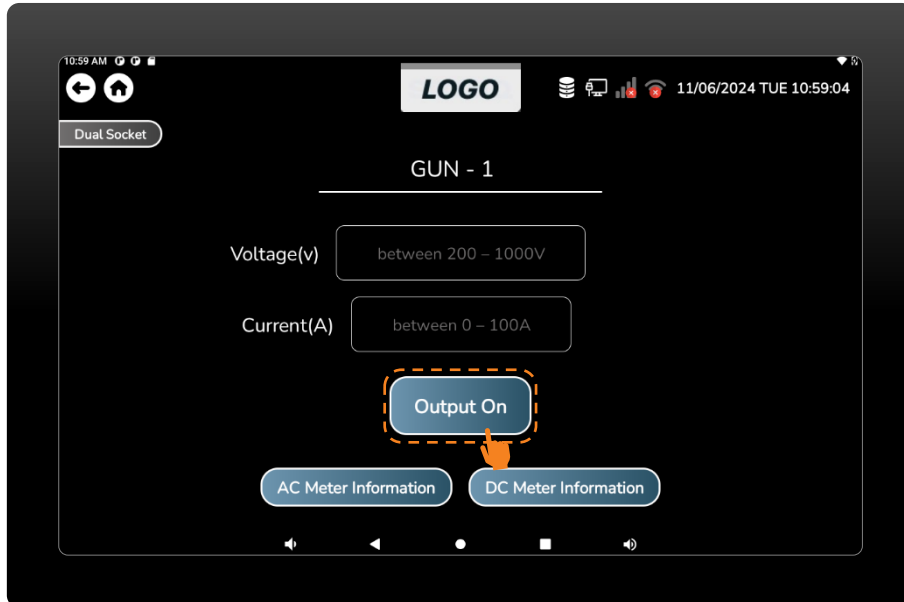


Figure 23 Press the output ON to test GUN-1.

#### A. AC Meter Information

- Pressing the AC Meter Information button will open the AC information screen. (Figure 24)

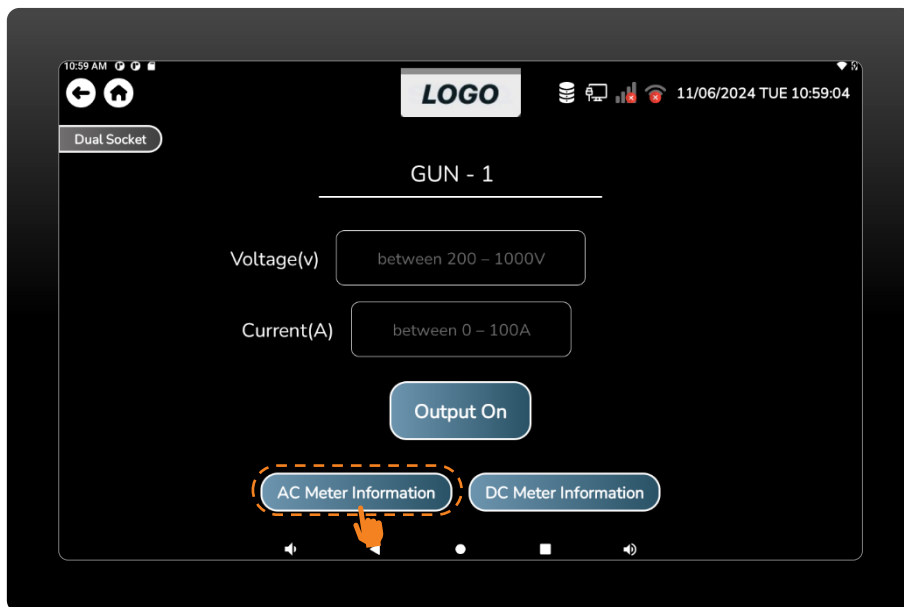


Figure 24 Press the AC Meter Information button.

- This is the AC meter information screen. The user can view information such as three phase voltage and current, average voltage and current, frequency, active power, and total export energy. (Figure 25)

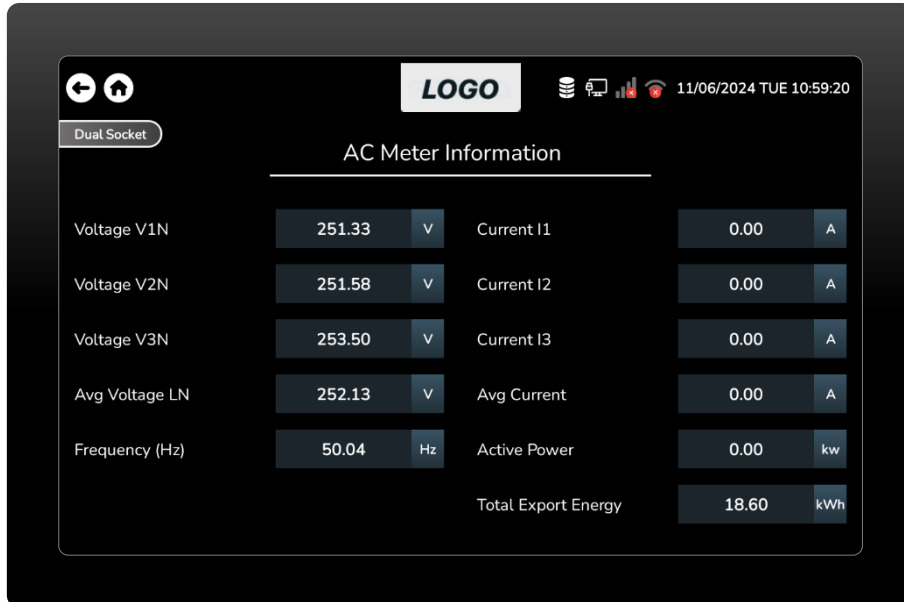


Figure 25 AC Meter Information Screen.

## B. DC Meter Information

- Pressing the AC Meter Information button will open the DC information screen. (Figure 26)

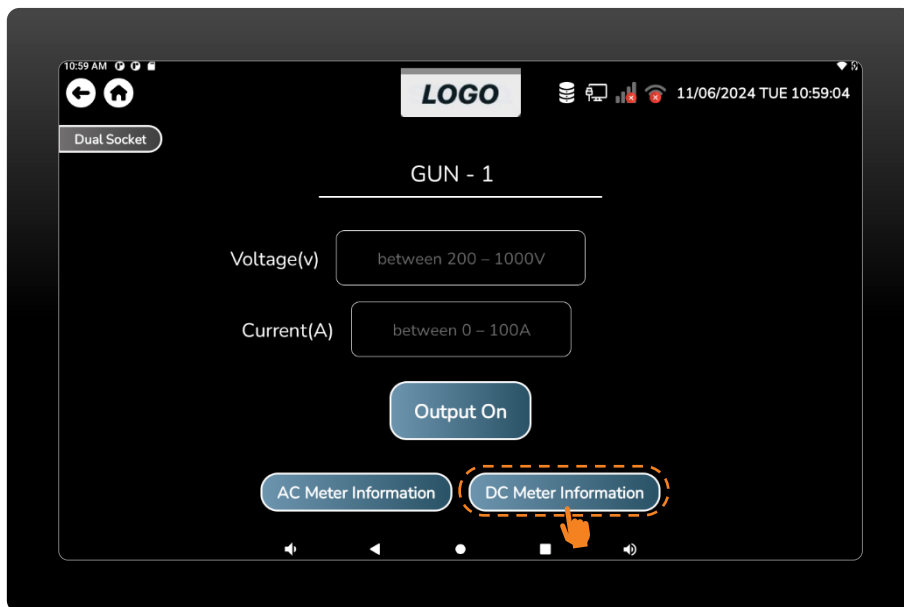


Figure 26 Press the DC Meter Information button.

- This is the DC meter information screen. The user can view information such as voltage, maximum and lowest voltage, current, maximum and minimum current, power, import and export energy. (Figure 27)

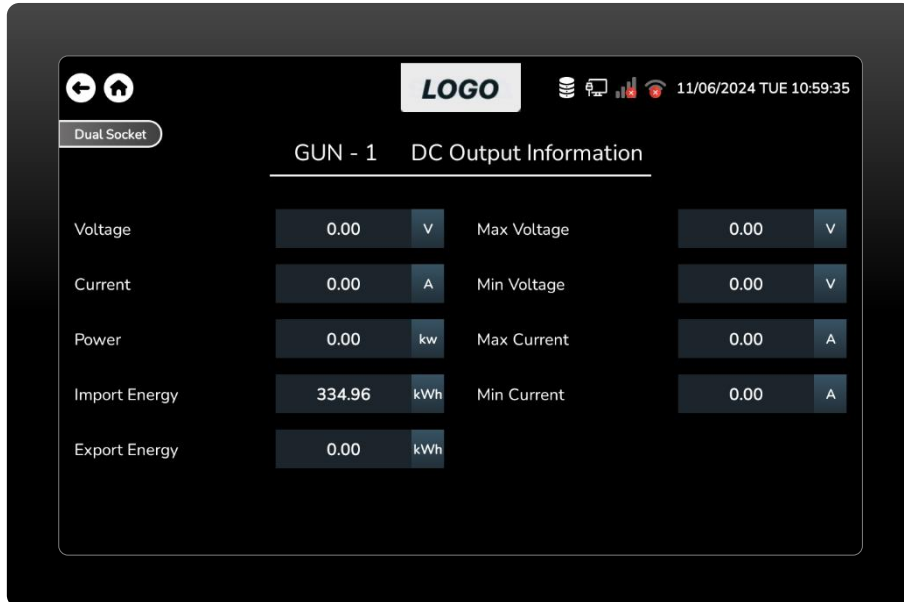


Figure 27 GUN-1 DC Output Information.

### 3.1.7.2 GUN-2 Test Mode

- Press the GUN-2 option from the test mode screen. (Figure 28)

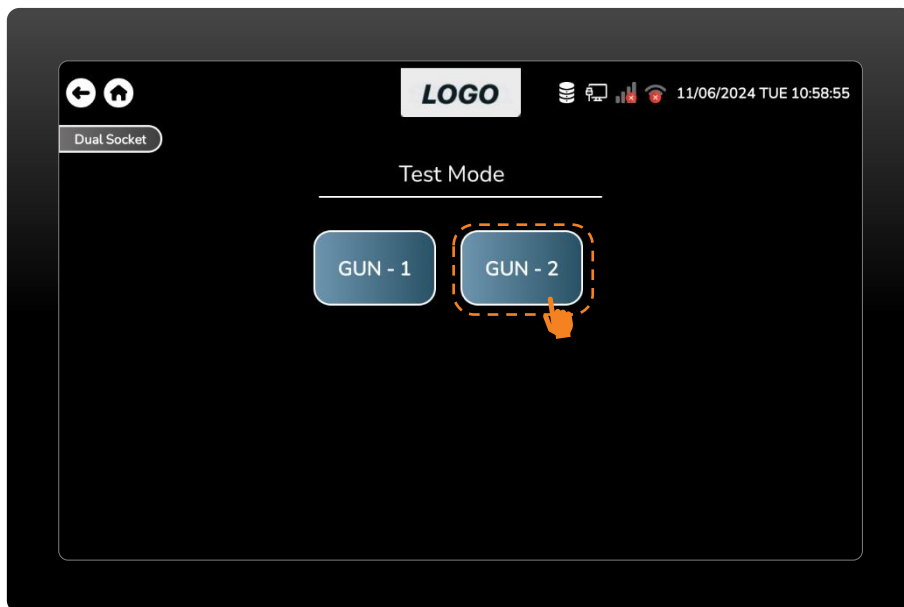


Figure 28 Press the GUN-2 Option.

- This is the GUN-2 screen, where the user can test set the voltage and current within the prescribed range and then press the output on button, that will provide the charging output accordingly. (Figure 29)

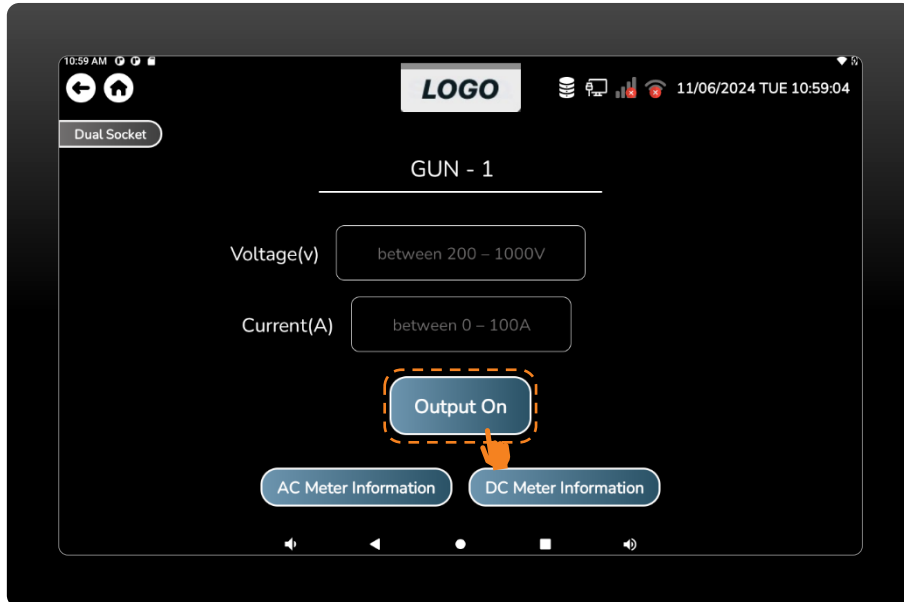


Figure 29 Press the Output ON to Test GUN-2.

#### A. AC Meter Information

- Pressing the AC Meter Information button will open the AC information screen. (Figure 30)

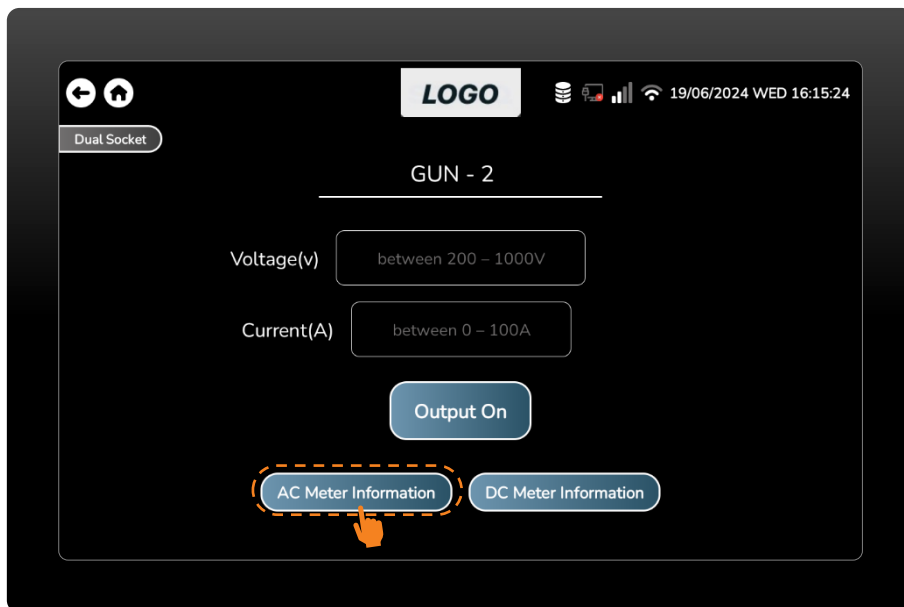


Figure 30 Press the AC Meter Information Button.

- This is the AC meter information screen. The user can view information such as three phase voltage and current, average voltage and current, frequency, active power, and total export energy. (Figure 31)

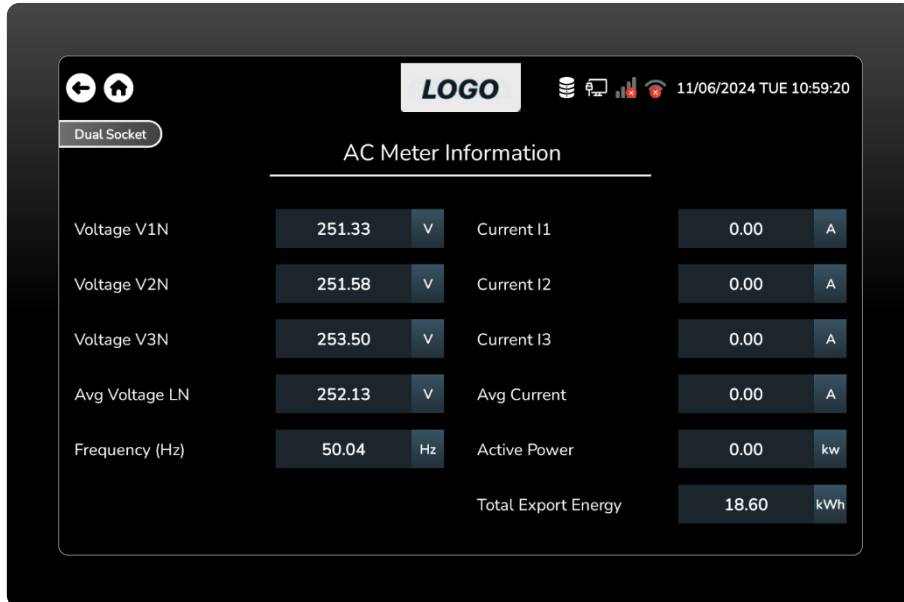


Figure 31 AC Meter Information Screen.

## B. DC Meter Information

- Pressing the AC Meter Information button will open the DC information screen. (Figure 32)

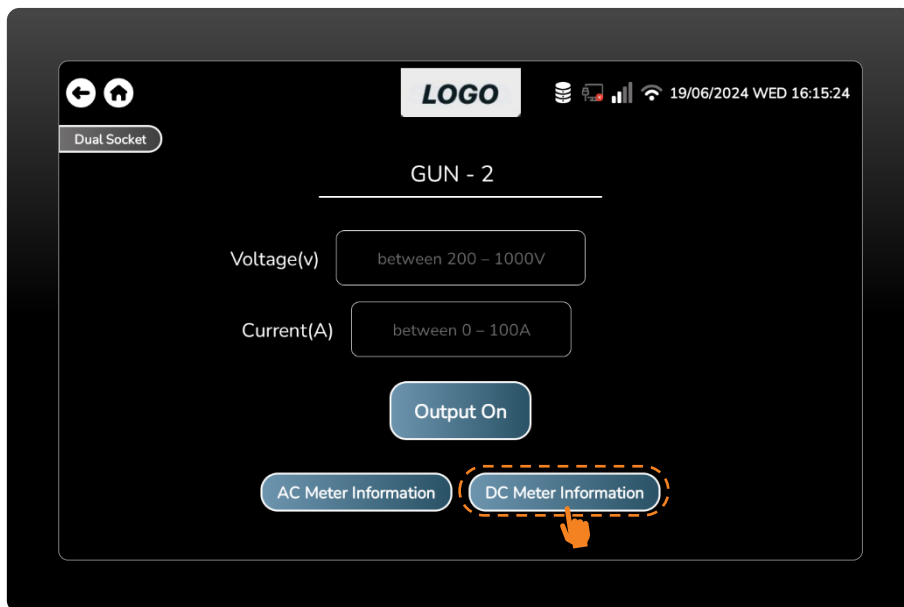


Figure 32 Press the DC Meter Information Button.

- This is the DC meter information screen. The user can view information such as voltage, maximum and lowest voltage, current, maximum and minimum current, power, import and export energy. (Figure 33)

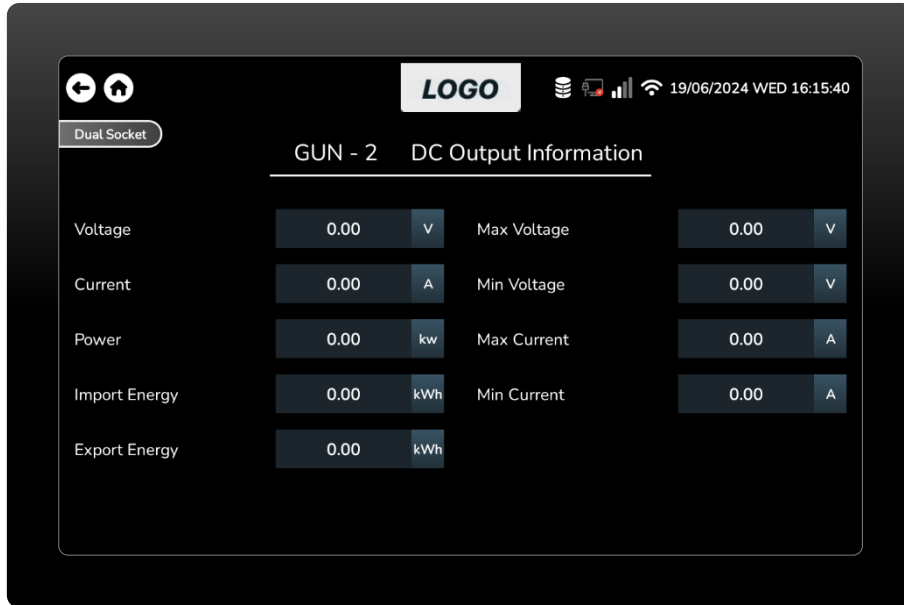


Figure 33 GUN-2 DC output information.

### 3.1.8 Charger Commissioning

- Press the charger commissioning button. (Figure 34)

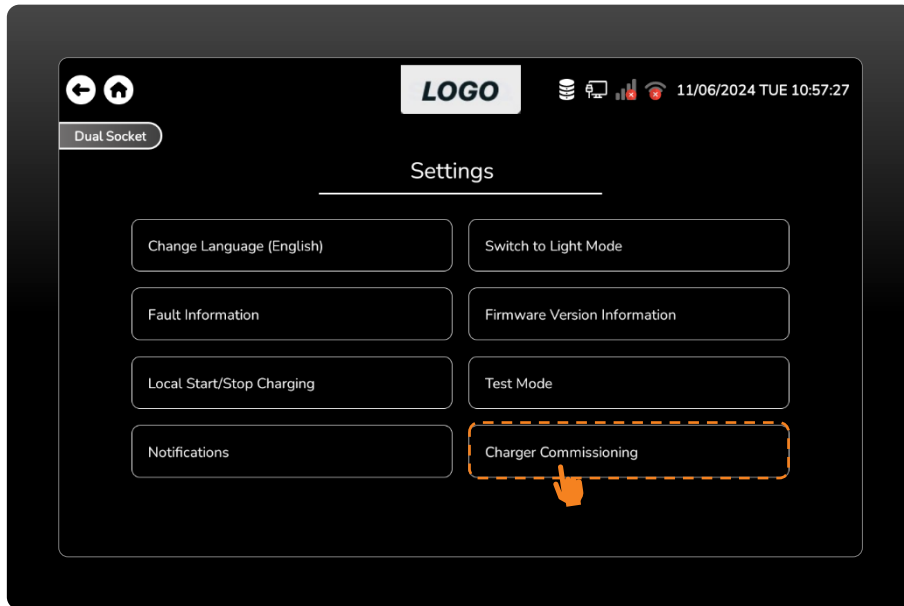


Figure 34 Press the Charger Commissioning.

- Wait a few minutes and it will start the commissioning procedure. (Figure 35)

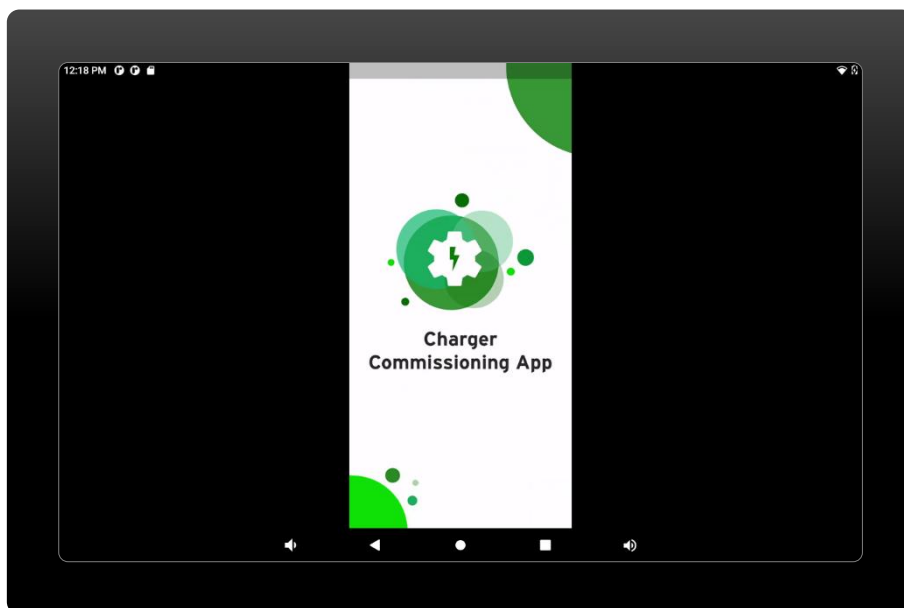


Figure 35 Booting Charger Commissioning Application.

### Step 1. Login Credential

- This is the charger commissioning application's login screen, where users can enter proper login credentials and then press the login button. (Figure 36)

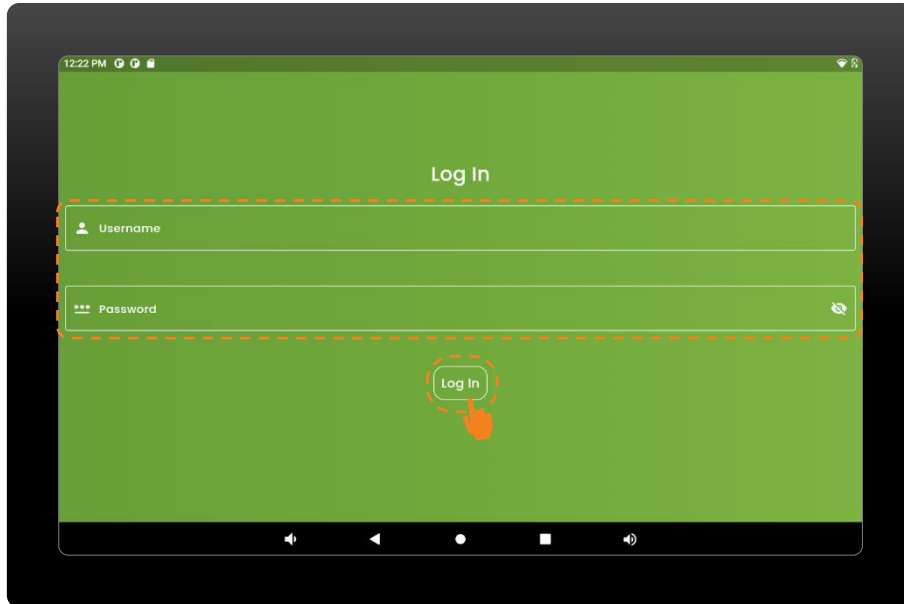


Figure 36 Login Credential Screen.

### Step 2. Choose Charger Type

- Select DC charger, and then press the next button. (Figure 37)

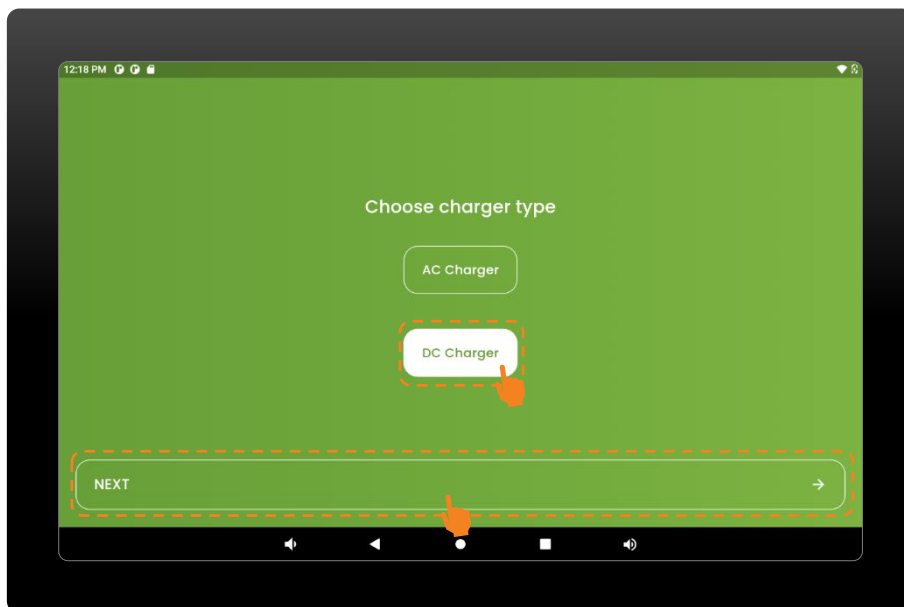


Figure 37 Choose charger type screen.

### Step 3. Discovery Enable for Register Devices

- Press the discovery enable button. (Figure 38)

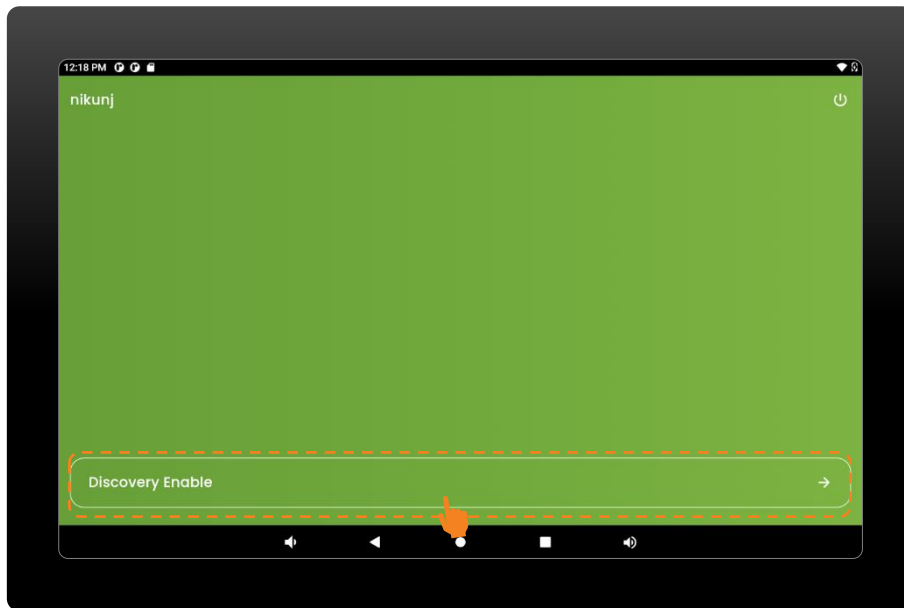


Figure 38 Discovery Enable Screen.

- The device list will refresh every 5 seconds, therefore select the appropriate device from the list.
- To update the registered list, use the refresh button.

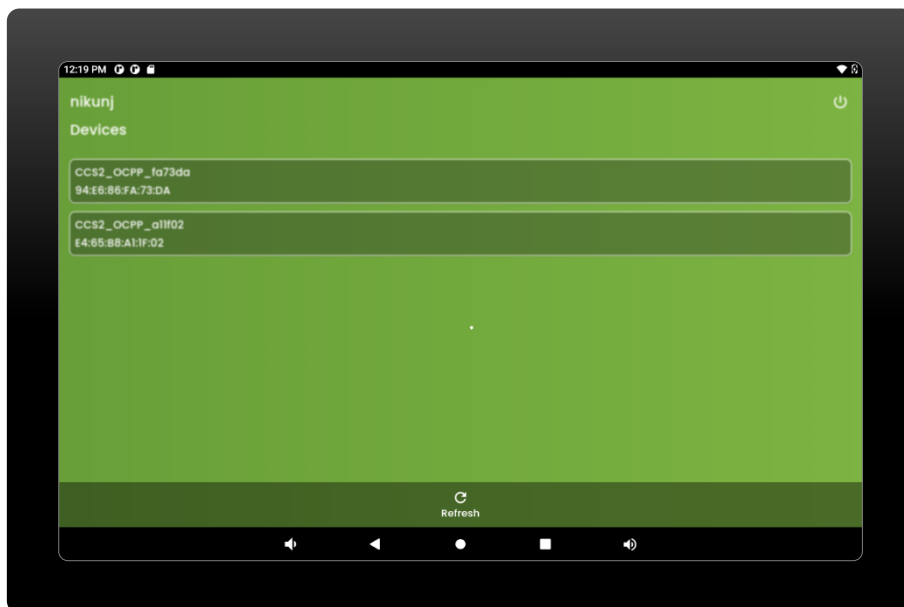


Figure 39 Devices Visible Screen.

**Step 4. Commissioning Screen**

- This is a commissioning screen where there are three main options, are too important to configuration controller, OTA firmware upgrade and upload or delete the certificate.



NOTE!	Unregistered Devices
	Initially, the user should register the device on web portal then it will be permissible for commissioning process.



Figure 40 Commissioning Screen.

NOTE!	Tip for Configuration.
	<ul style="list-style-type: none"> <li>• In offline mode, the user should not configure Wi-Fi or GSM; instead, press the <b>Skip</b> skip button.</li> <li>• If the charger is in plug-and-play or offline RFID mode, Wi-Fi/GSM should not be configured. Press the <b>Skip</b> skip button.</li> <li>• If the user has access to both interface types, network switching is only permissible; otherwise, it should be disabled.</li> <li>• If the internet could not receive continuously for 1 minute on the Wi-Fi interface, then the module switched from Wi-Fi to GSM. Similarly, if the internet could not be received continuously for 3 minutes in the GSM module, then the module switched from GSM to Wi-Fi. So do not forget to add both Wi-Fi and GSM configurations.</li> </ul>

**A. Wi-Fi / GSM Configuration Screen**

**Step 1. Configuration Option**

- Press the configuration option.

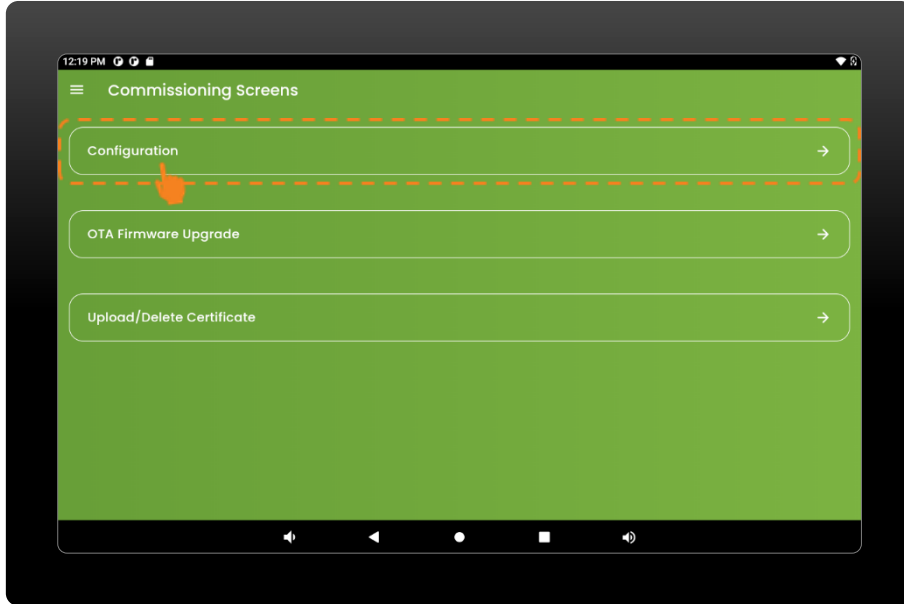



Figure 41 Press the Configuration Option.

MADATORY	<b>GSM Configuration</b>
	<p>Before GSM configuration, the position of the GSM module should be on top of the EV charger, and it should have a SIM card with an active internet pack.</p>

**Step 2.** Enter the Wi-Fi configuration parameters.

**Step 3.** Click on the save & next button or the skip button to skip this configuration sections.

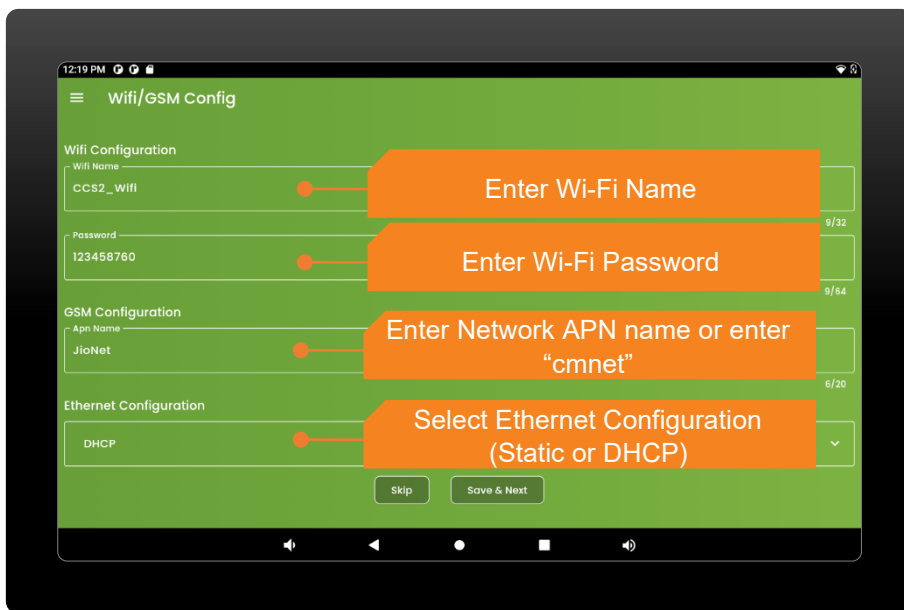


Figure 42 Wi-Fi / GSM configuration screen

## B. Charger Configuration

**Step 1.** Enter charger configuration parameters.

**Step 2.** Press on the save & next button or the skip button to skip this configuration sections.

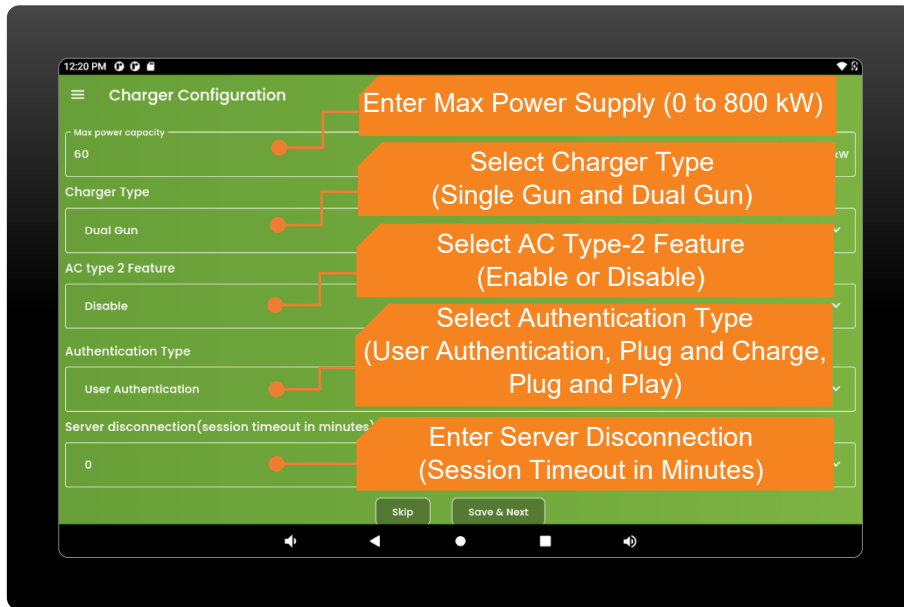


Figure 43 Charger configuration screen.

## C. Charger Point Configuration

**Step 1.** Enter charger configuration parameters.

**Step 2.** Press on the save & next button or the skip button to skip this configuration sections.

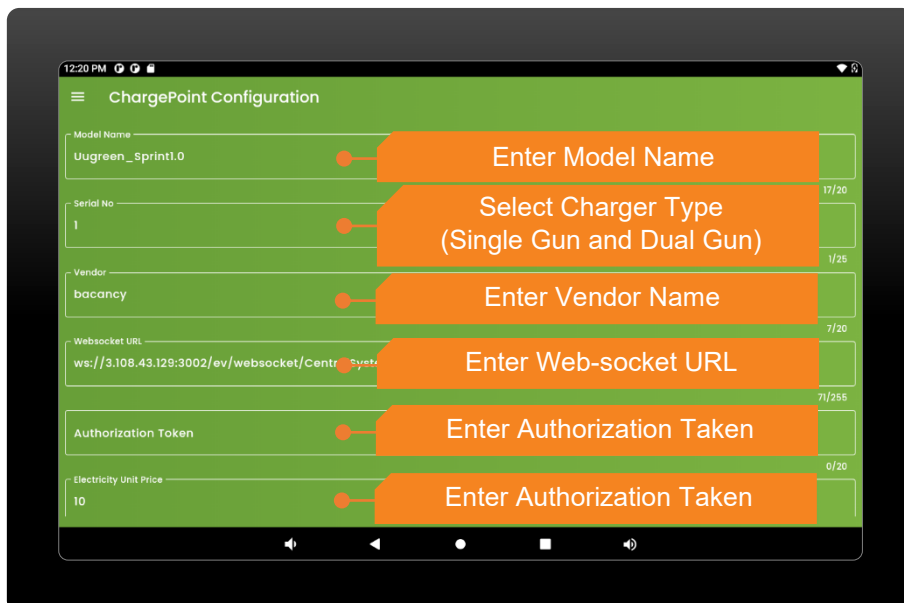


Figure 44 ChargePoint Configuration Screen.

- Scroll down the for the further chargepoint configuration parameters.



Figure 45 ChargePoint Configuration Screen 2.

### Step 5. OTA Firmware Upgrade

- Enter a URL Link. (After submission of URL, the system will be rebooted.)
- Click on the “Save” button to save configuration.

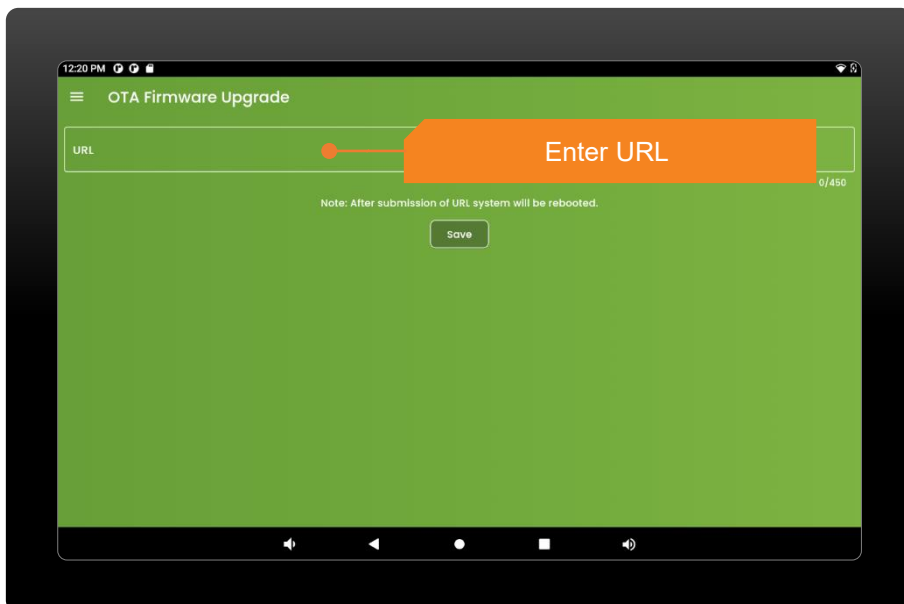



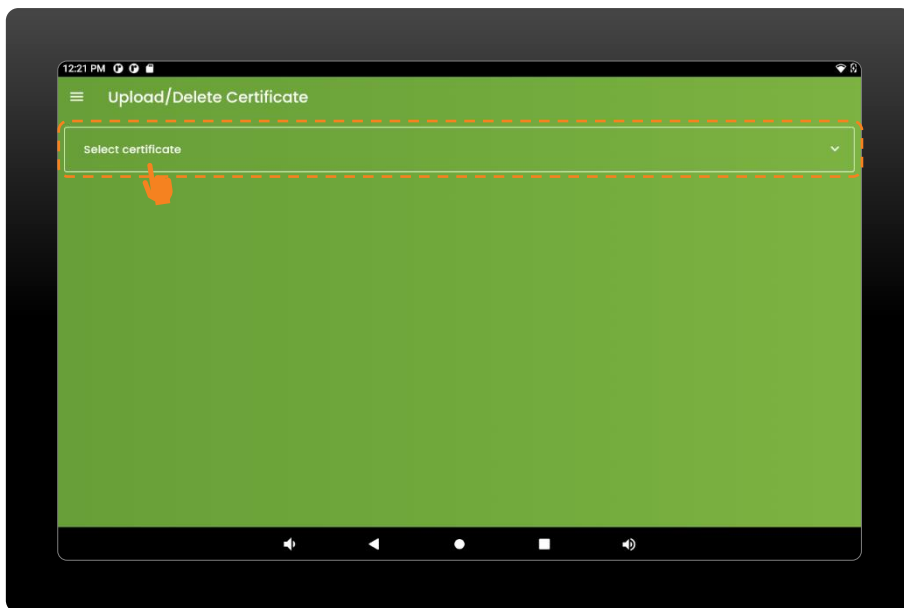
Figure 46 OTA firmware upgrade screen.

**Step 6. Upload Certification**

- The user can upload two types of certificates.
  1. Secure websocket certificate
  2. Secure the OTA firmware upgrade certificate

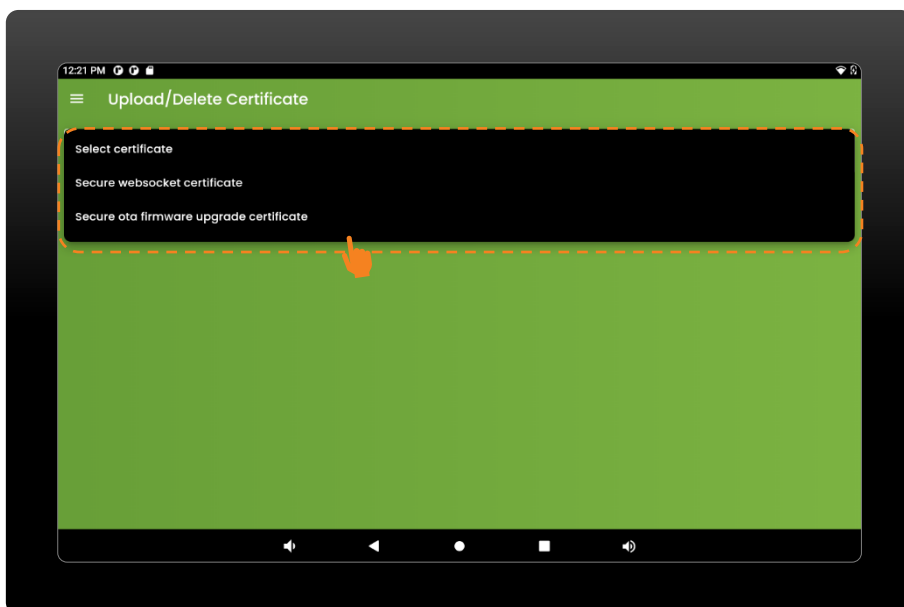
<b>NOTE!</b>	<b>WSS Cerfiguration</b>
	<p>Do this configuration only if the user can use a secure websocket (WSS) connection with the OCPP-compliant server.</p>

- Press the select certificate, it will open the dropdown menu.



*Figure 47 Select Certification*

- Choose upload certification type as per your requirements.



*Figure 48 Select Certification from the dropdown menu.*

- To upload the selected certificate, Press the upload certificate button.

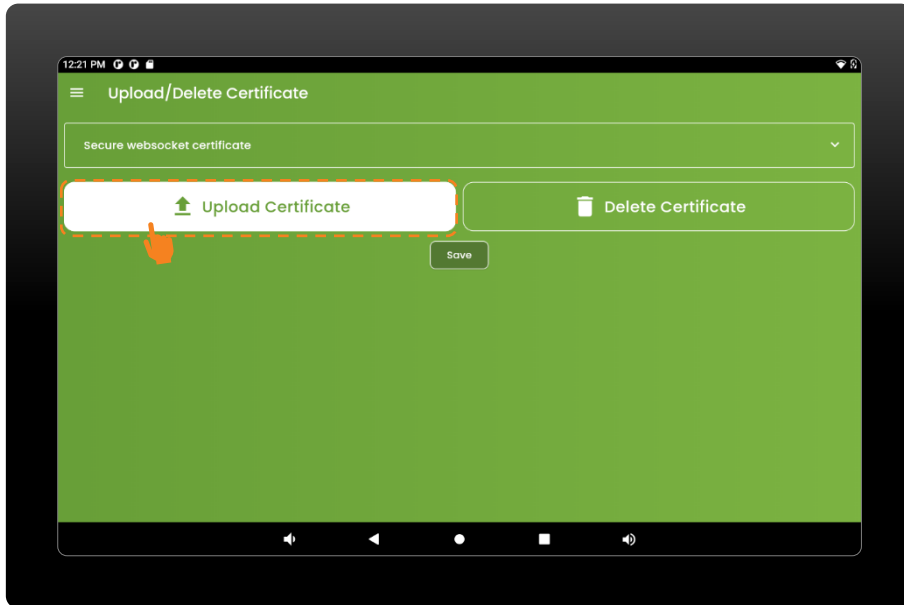


Figure 49 Press the upload certificate button.

- To delete the selected certificate, Press the delete certificate button.

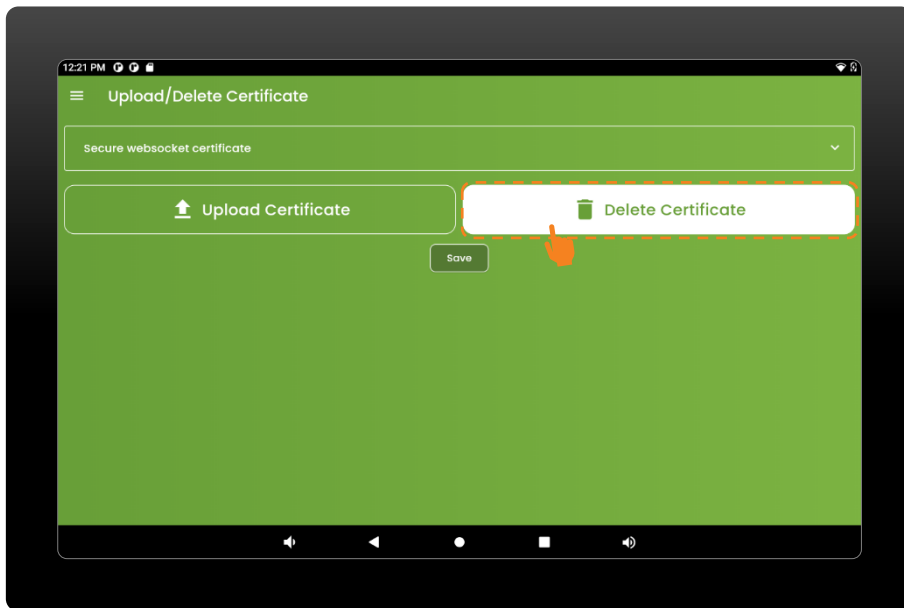


Figure 50 Press the delete certificate button.

**Step 7. Disconnect Process**

- Open the menu, then press the disconnect device.



Figure 51 Open the menu.

- Press the yes button to disconnect commissioning application.

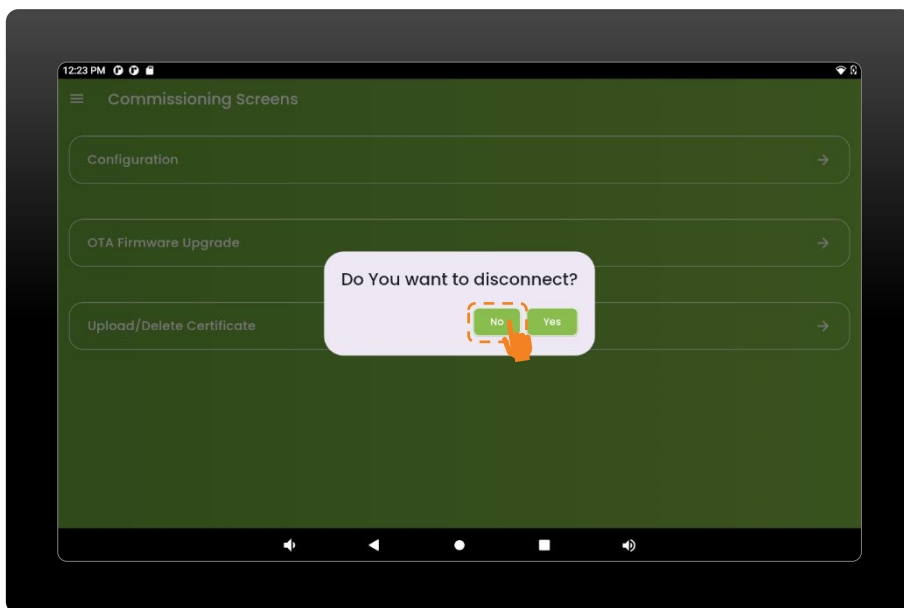


Figure 52 Press the yes button.

## 4 Single Socket

- This is a dashboard screen that allows the user to charge the vehicle with either GUN-1 or GUN-2. Follow the next section for a better understanding. (Figure 53)

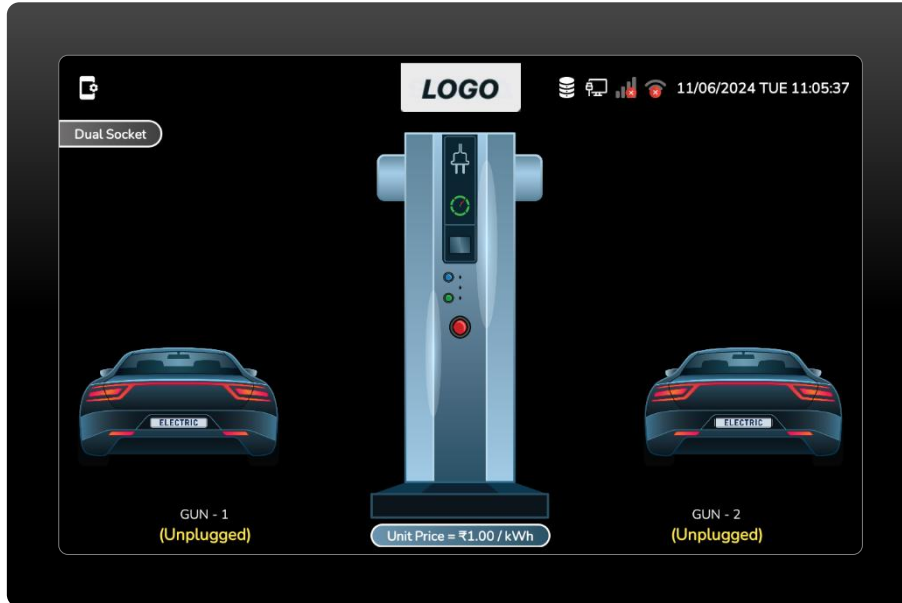


Figure 53 Dashboard Screen.

### 4.1 Single Gun Plugged-In

- Plugged one gun to the vehicle, the display indicates the plugged-in status, and the yellow GUN charger connects to the vehicle, as shown in the figure below. (Figure 54)

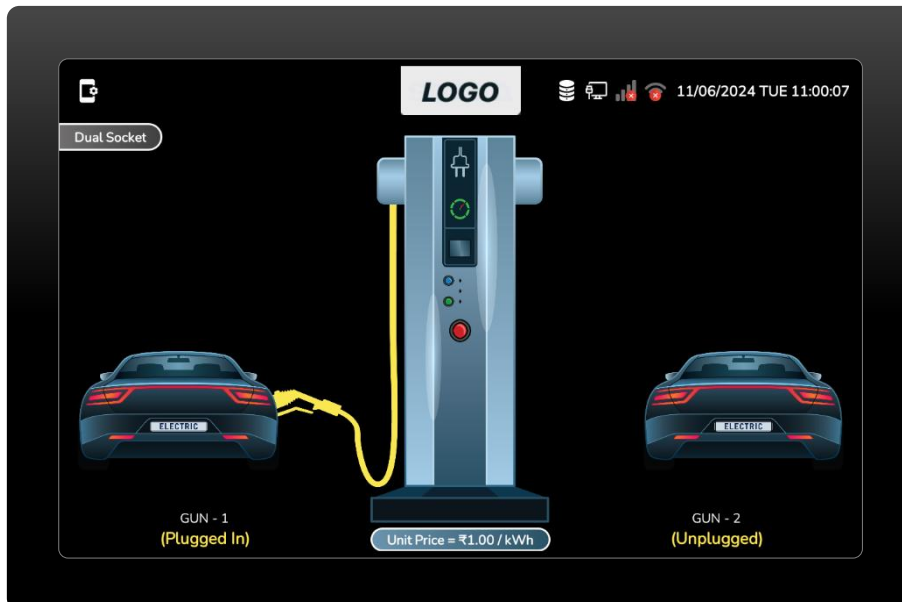


Figure 54 GUN Plugged in with Vehicle.

## 4.2 Start the Charging Process

- Pressing the GUN-1 vehicle symbol initiates the charging procedure under session mode. (Figure 55)

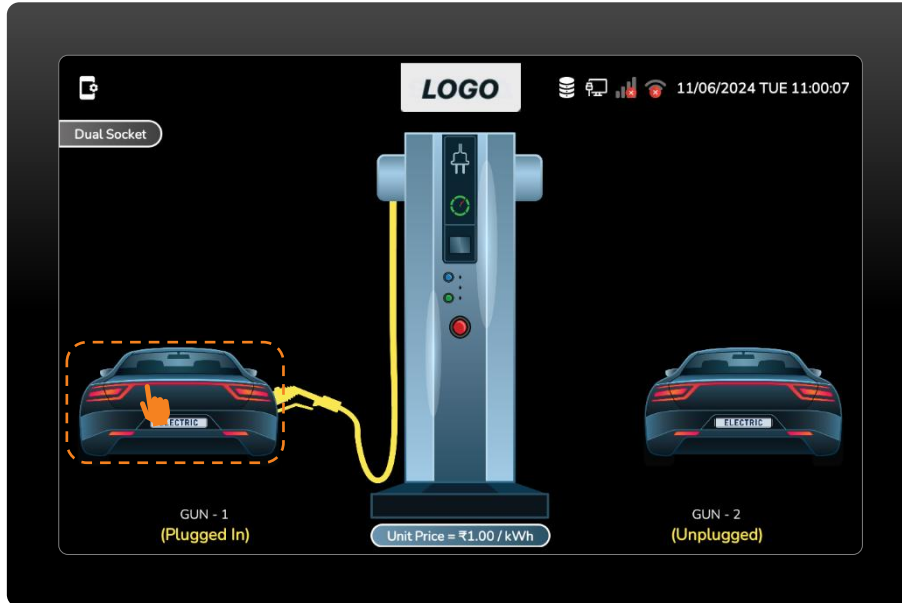


Figure 55 Press the GUN-1 Vehicle Icon.

## 4.3 Session Mode

- The charging process allows four types of session modes: auto mode, time mode, SoC mode, and energy mode, which can be selected according on the requirements. (Figure 56)

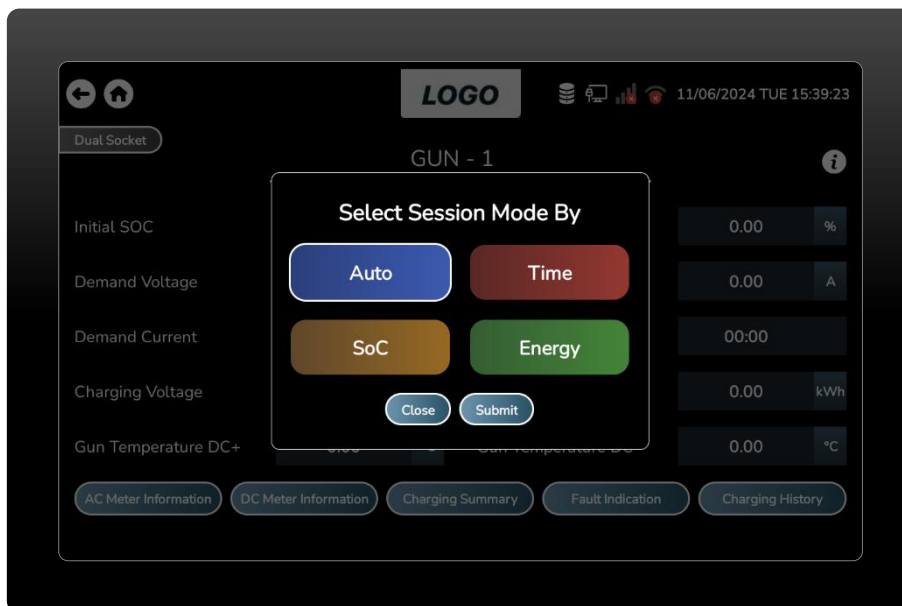



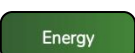




Figure 56 Select Session Mode.

Table 3 Session Mode Screen: Buttons and Functionality

No.	Icon	Name	Function
1.		Auto Mode	To set the charging session in default an ideal parameter.
2.		Time Mode	To set the charging session for a time period ranging from 1 to 999 minutes.
3.		SoC Mode	To set the charging session in the specified SoC from 1 to 100%.
4.		Energy Mode	To set the charging session for energy consumption ranging from 0.01 to 999.99 kWh.
5.		Close Button	Close the session selection mode.
6.		Submit Button	To submit the defined session mode.

### 4.3.1 Auto Mode

- This auto mode is set by default in session mode, where it uses an ideal parameter for charging the vehicle. (Figure 57)

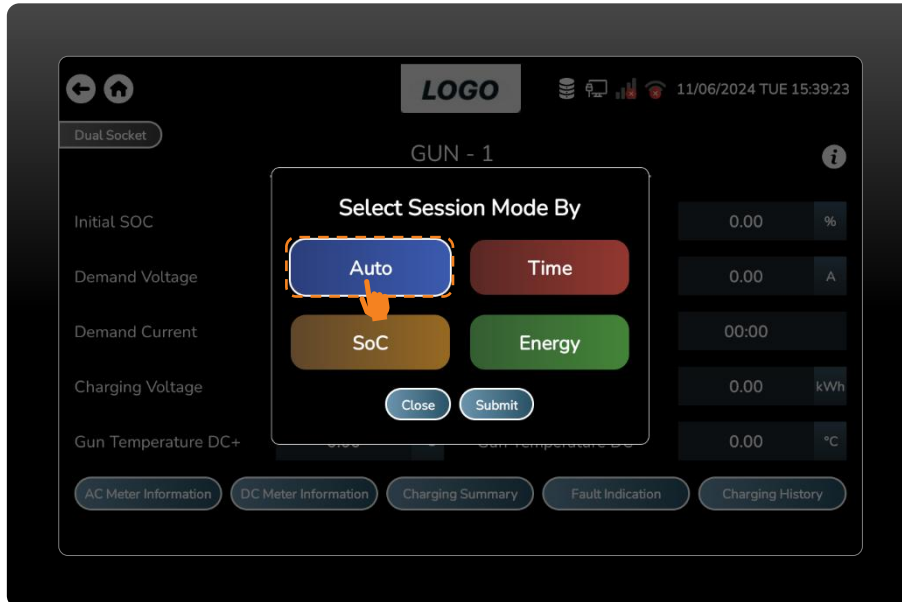


Figure 57 Auto Mode Select Mode.

### 4.3.2 Time Mode

- Time mode allows the user to specify a charging time ranging from 1 to 999 minutes, allowing the user to charge the vehicle at a certain time. (Figure 58)

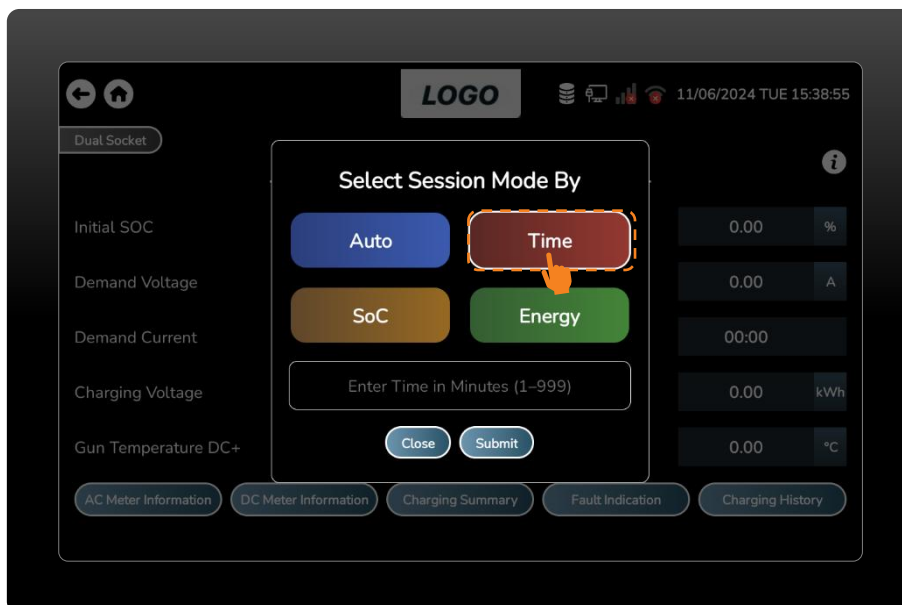


Figure 58 Time Mode Selection.

### 4.3.3 SoC Mode

- SoC mode allows the user to specify the state of charge, which ranges from 1 to 100%, allowing them to charge the vehicle at a certain percentage. (Figure 59)

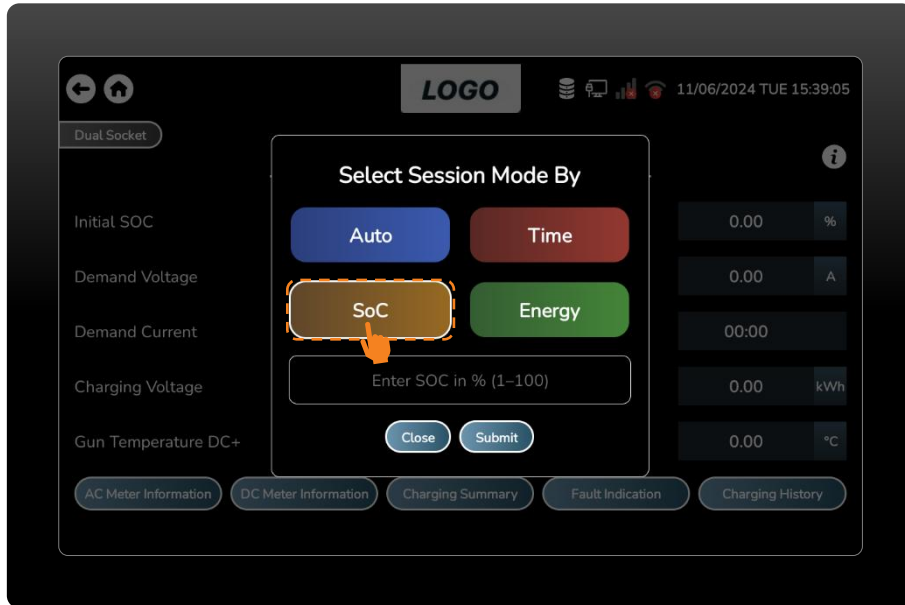


Figure 59 SoC Mode Selection.

### 4.3.4 Energy Mode

- Energy mode enables the user to choose the energy consumption, which ranges from 0.01 to 999.99, allowing them to charge the vehicle at a certain energy consumption. (Figure 60)

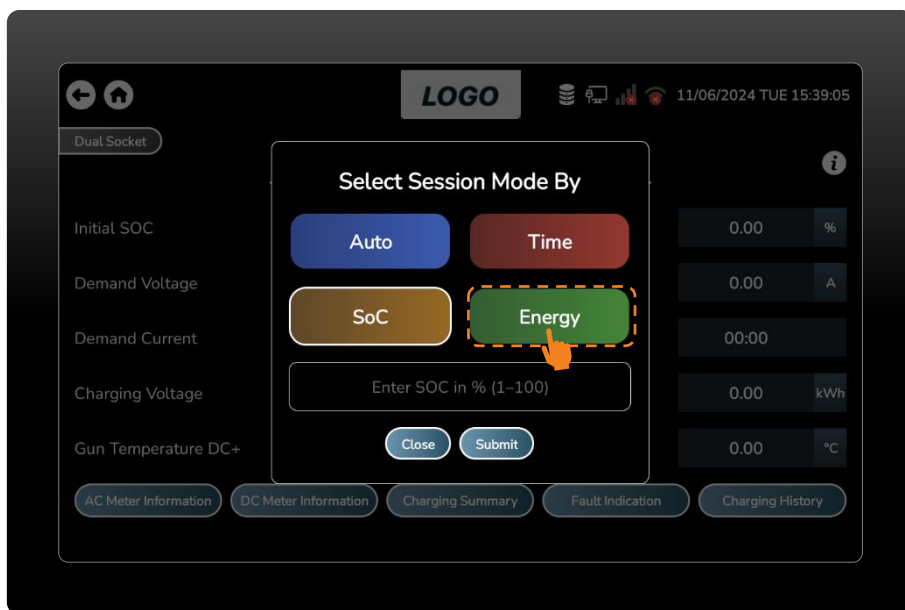


Figure 60 Energy Mode Selection.

## 4.4 Single Gun Charging

- **User Authentication**

- To start the charging process, the user requires authorisation by tapping their RFID card, entering the OTP, or selecting the remote start option. (Figure 61)

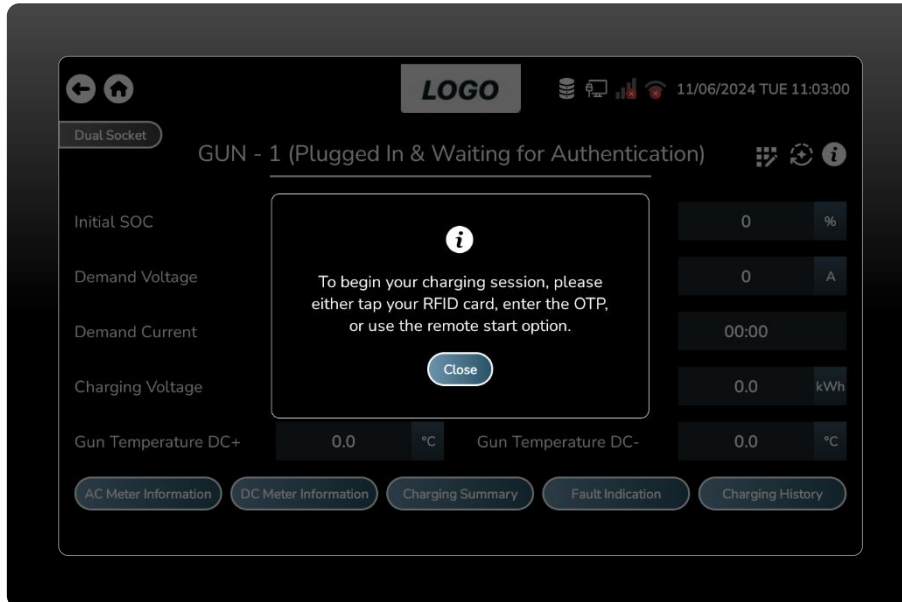


Figure 61 User Authentication pop-up on screen.

- **Charging Ongoing on Dashboard**

- After successfully user authentication, the user can view ongoing charging process from the dashboard with brief information about the ongoing charging process. (Figure 62)

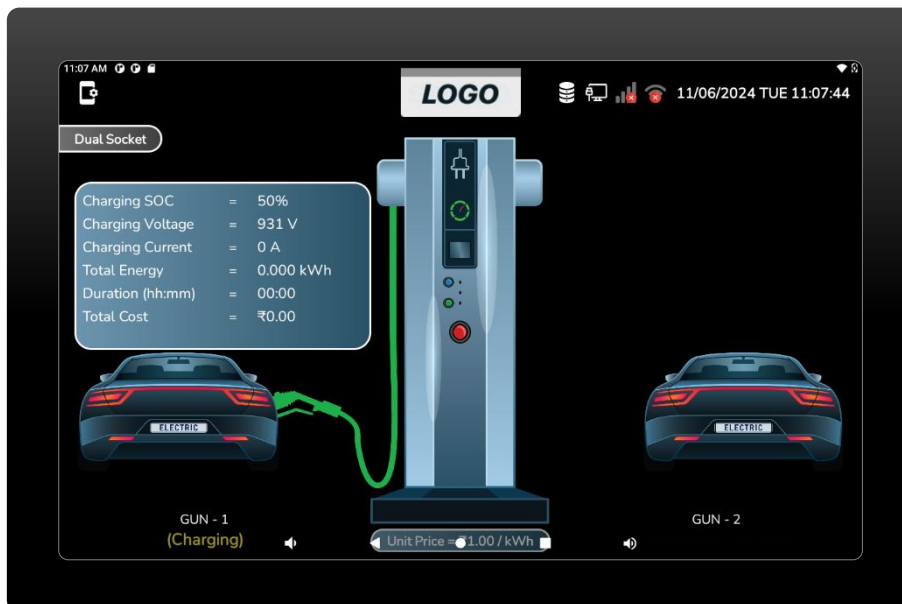


Figure 62 Single Gun Ongoing Charging Process.

#### 4.4.1 GUN-1 Charging Screen

- This is the GUN-1 charging screen, where the user can view information about the present charging session. To learn more, see the table below. (Figure 63)

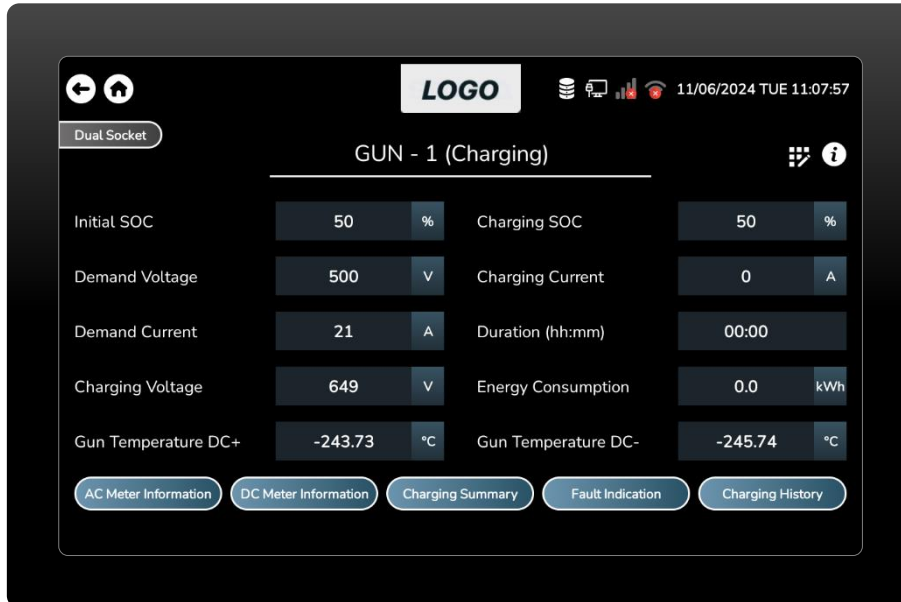





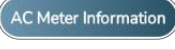
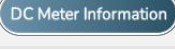
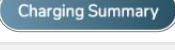




Figure 63 GUN-1 Charging Screen.

Table 4 Navigation Button: Gun-1 Parameter Screen.

No.	Icon	Name	Function
1.		Charge mode Button	To change selected charging mode.
2.		Info Button	To get information about user authorisation.
3.		Back Button	To move towards the back screen.
4.		Home Button	To move towards the dashboard screen.
5.		Dual Socket	To change a single socket to a dual socket.
6.		AC Meter Information	To get the AC meter information.
7.		DC Meter Information	To get the DC meter information.
8.		Charging Summary	To get the charging summary.
9.		Fault Indication	To get the fault indication information.
10.		Charging History	To get the previous charging history.

**4.4.1.1 AC Meter Information**

- To get information about the AC meter, press the AC meter information button. (Figure 64)

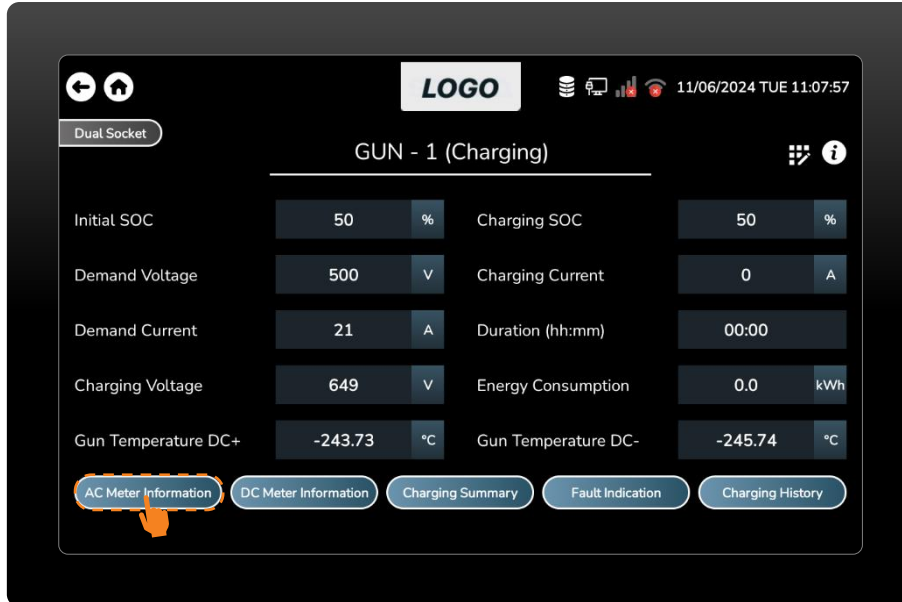


Figure 64 Press the AC Meter Information screen.

- This is the AC metre information screen, where the user can view information such as voltages, average voltage, frequency, currents, average current, active power, and total export energy. (Figure 65)

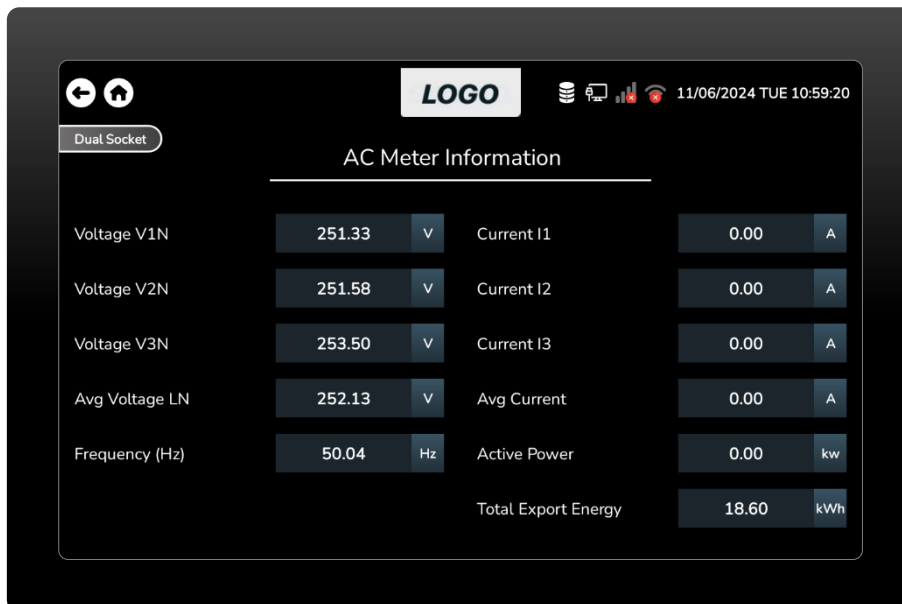


Figure 65 AC Meter Information Screen.

#### 4.4.1.2 DC Meter Information

- To get information about the DC meter, press the DC meter information button. (Figure 66)

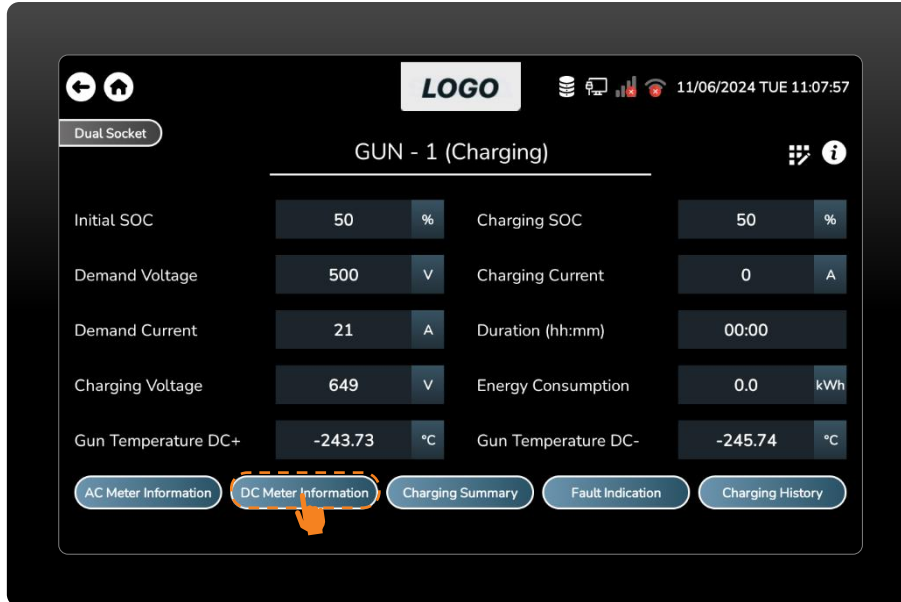


Figure 66 Press the DC Meter Information Button.

- This is the DC meter information screen, where the user can view information such as voltage, maximum voltage, minimum voltage, currents, maximum current, minimum current, power, import energy, and export energy. (Figure 67)

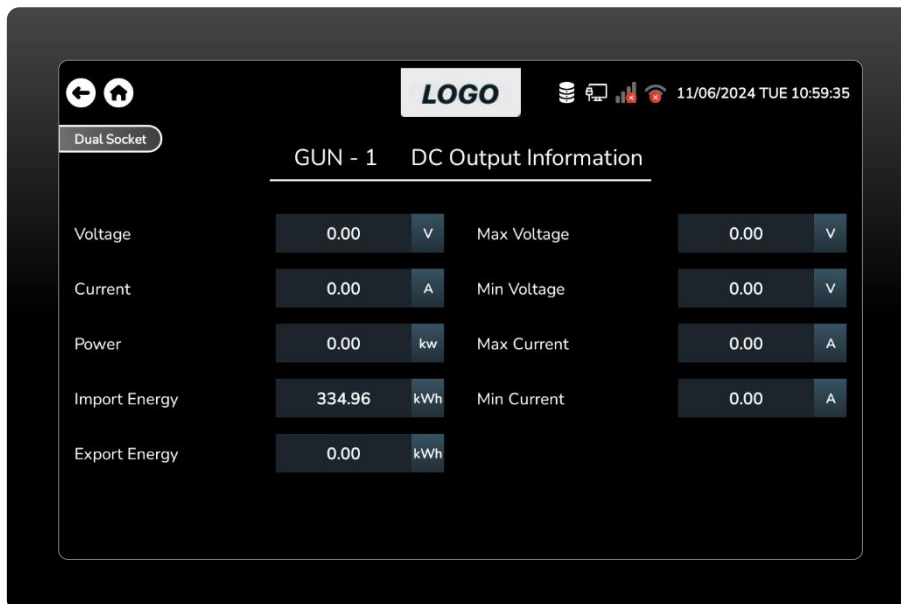


Figure 67 DC Output Information.

### 4.4.1.3 Charging Summary

- To get information about the charging summary, press the charging summary button. (Figure 68)

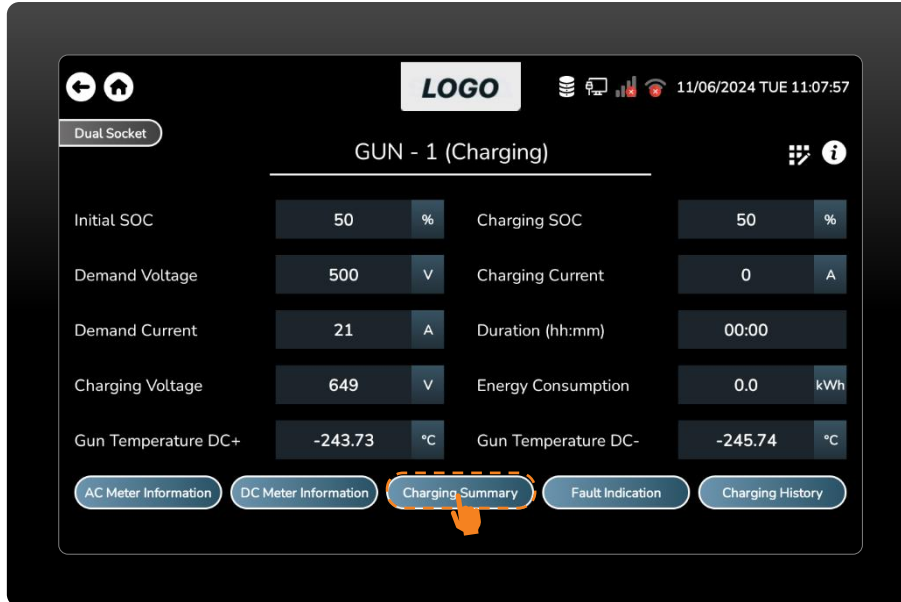


Figure 68 Press the Charging Summary Button.

- This is a GUN-1 charging summary screen where the user can view charging summary information such as the EV mac address, charging duration, charging start and finish dates and times, start and end SoC, energy consumption, session end reason, and total cost. (Figure 69)

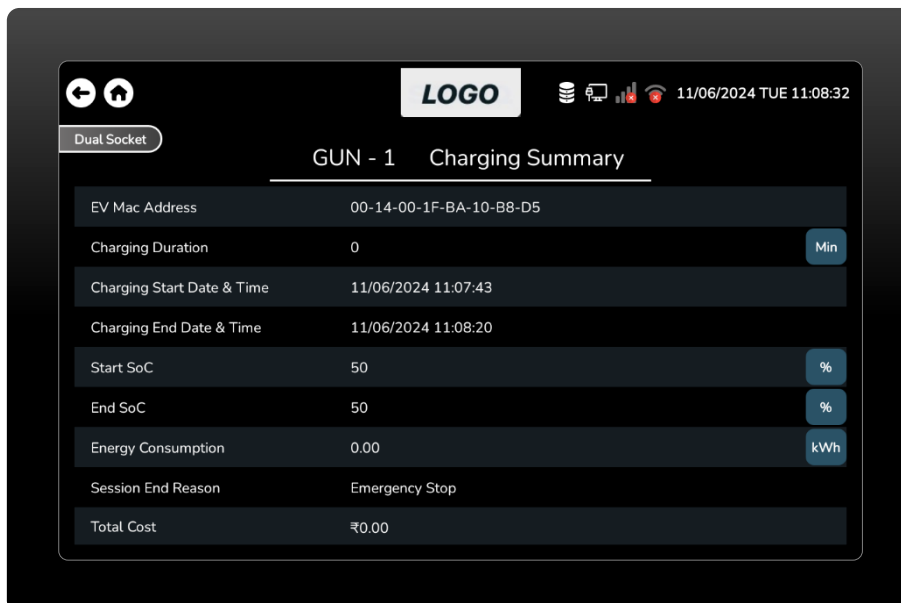


Figure 69 GUN-1 Charging Summary Screen.

#### 4.4.1.4 Fault Indication

- To get information about the fault information, press the fault indication button. (Figure 70)

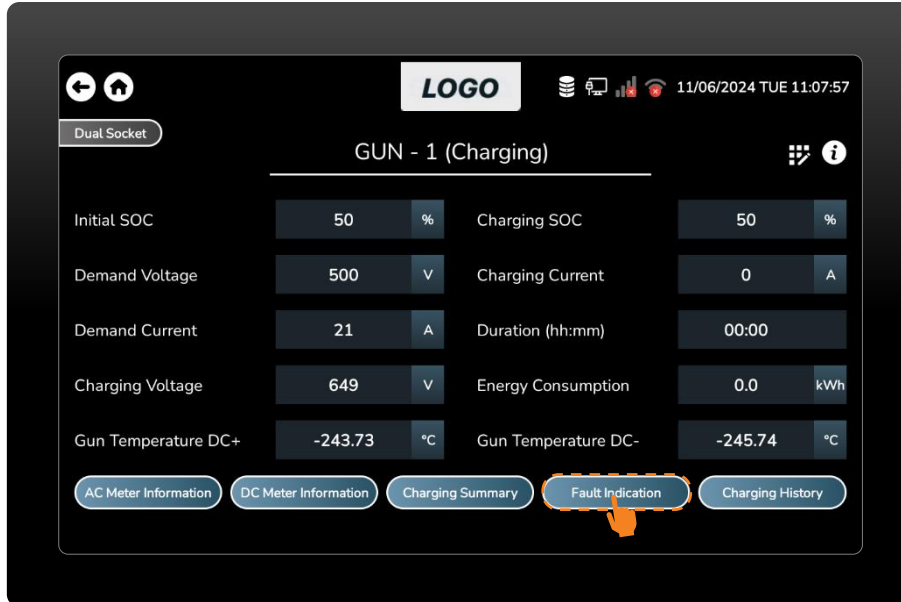


Figure 70 Press the fault indication button.

- This is the fault information screen, where the user can view fault information for the PLC, rectifier, communication, and miscellaneous. (Figure 71)

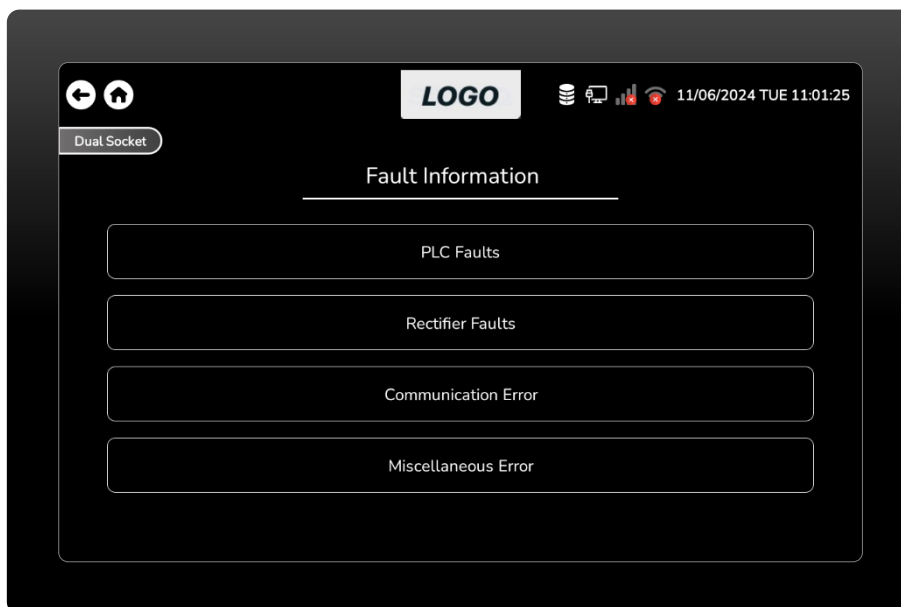


Figure 71 Fault Information Screen.

**A. PLC Faults**

- To get information about PLC faults, press the PLC faults button. (Figure 72)

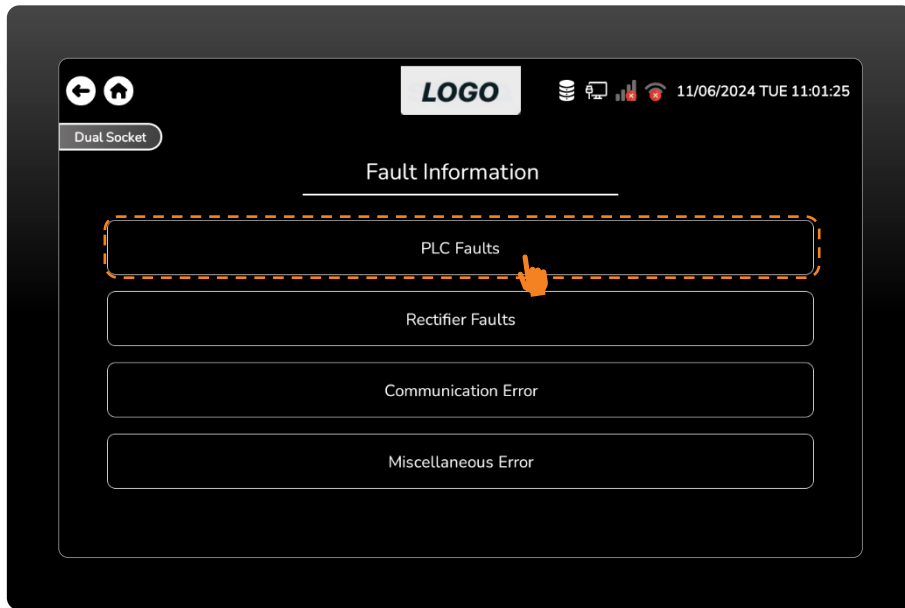


Figure 72 Press the PLC Faults Button.

- This is the PLC faults screen, where the user can view PLC faults for GUN-1 and GUN-2. (Figure 73)

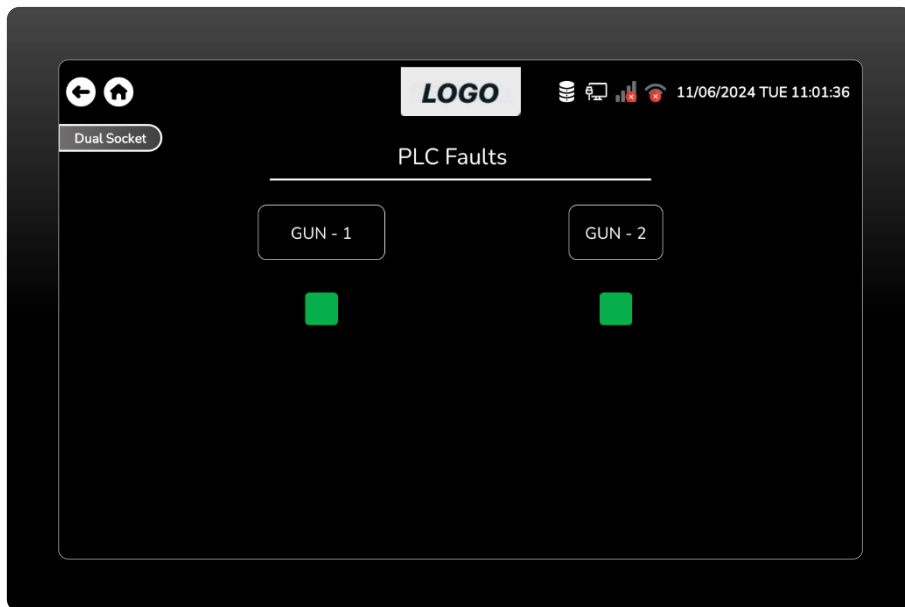




Figure 73 PLC Faults Screen.

Table 5 PLC Fault Icon and Error

No.	Icon	Name	Function
1.		No Error	There is no PLC error indicator.
2.		Error	There is a PLC error indicator.

## B. Rectifier Faults

- To get information about rectifier faults, press the Rectifier faults button. (Figure 74)

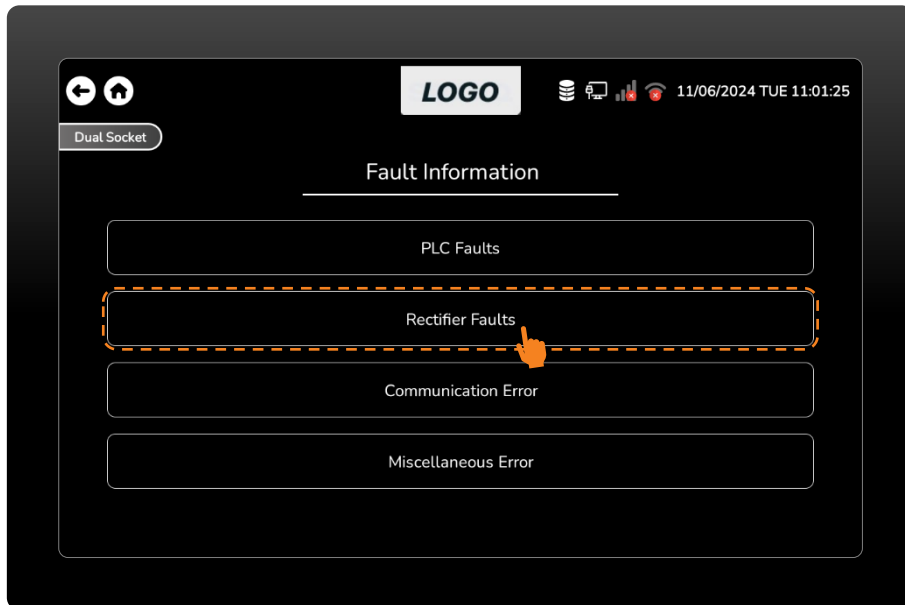


Figure 74 Press the Rectifier Faults Button.

- This is the rectifier fault information screen, where the user can view the error codes of rectifiers. (Figure 75)

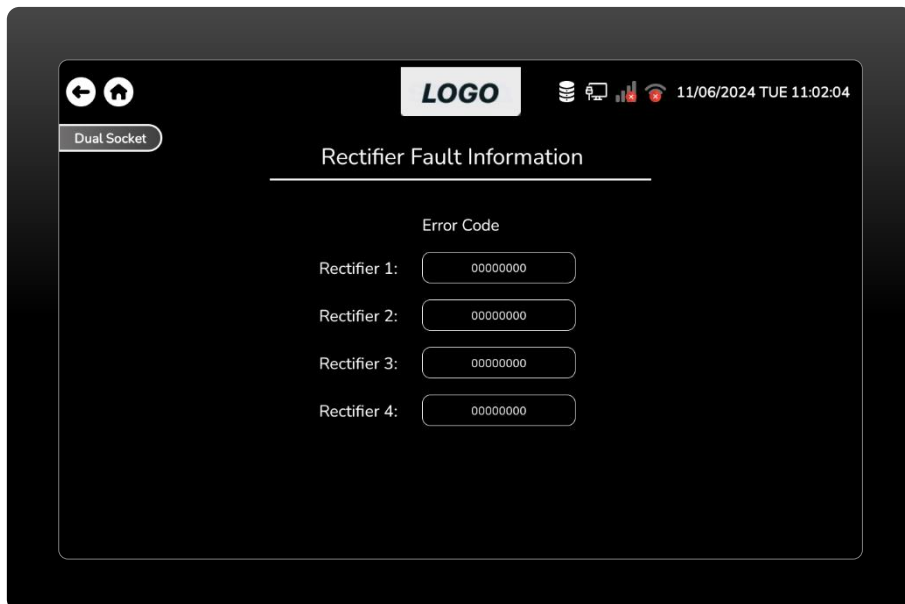


Figure 75 Rectifier Fault Information Screen.

**C. Communication Error**

- To get information about communication fault, press the communication error button.  
(Figure 76)

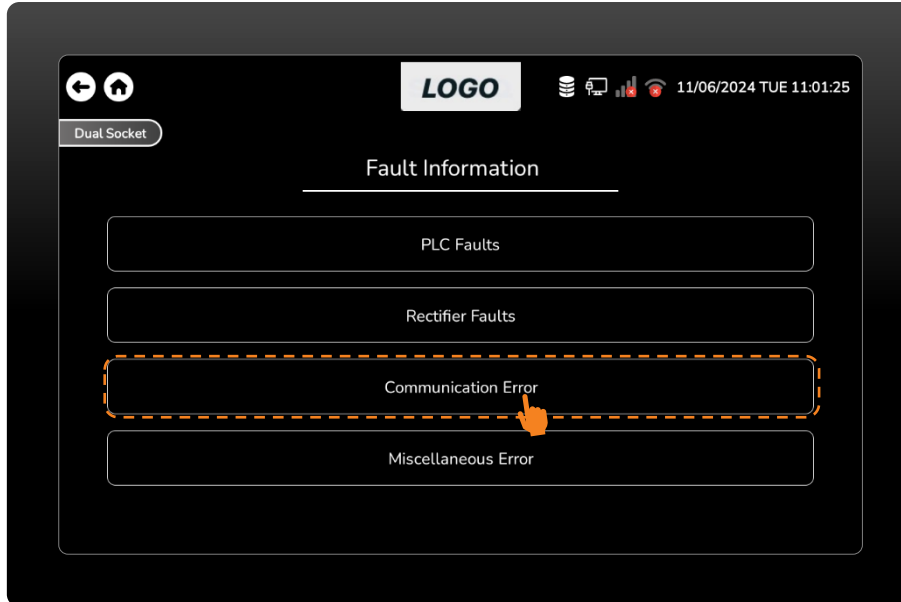


Figure 76 Press the Communication Error Button.

- This is the communication failure screen, where the user can view information about communication errors such as PLC, rectifier, OCPP, and Modbus master. (Figure 77)

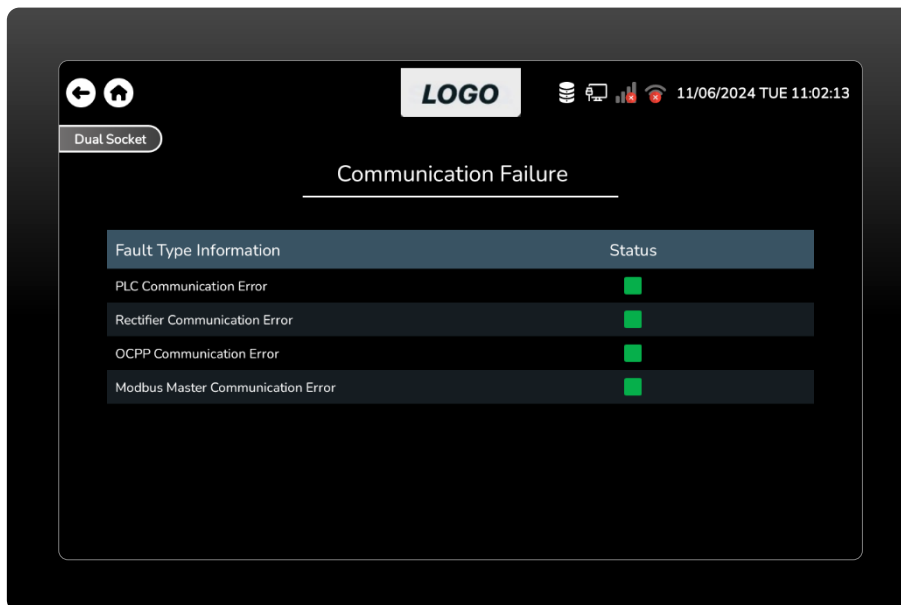


Figure 77 Communication Failure Screen.

Table 6 Communication Failure Icon and Error

No.	Icon	Name	Function
1.		No Error	There is no communication failure status.
2.		Error	There is a communication failure status.

### D. Miscellaneous Error

- To get information about the device connection status, press the miscellaneous error button. (Figure 78)

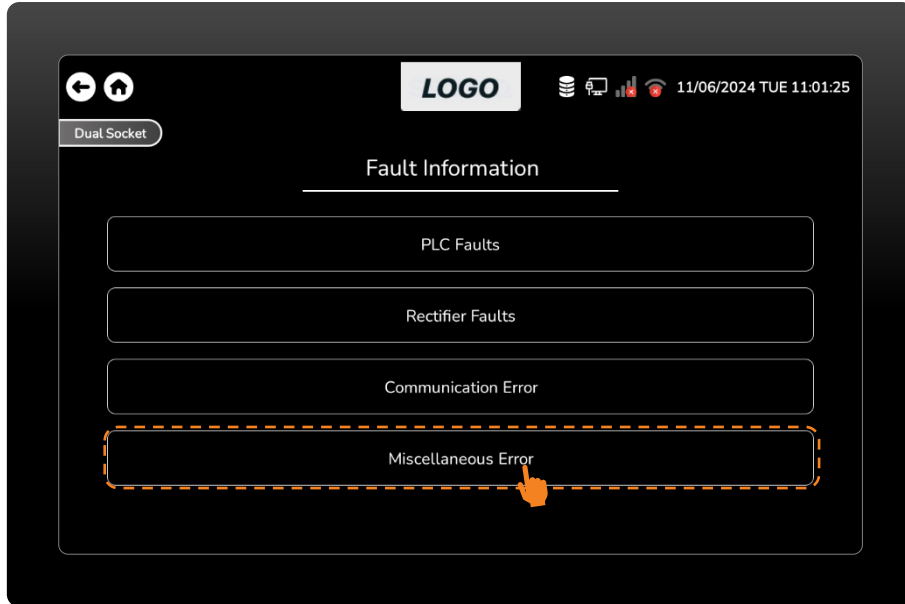


Figure 78 Press the Miscellaneous Error Button.

- This is a device connection status screen that indicates the status of devices such as RFID and LED modules, as well as AC, DC meters 1 and 2. (Figure 79)

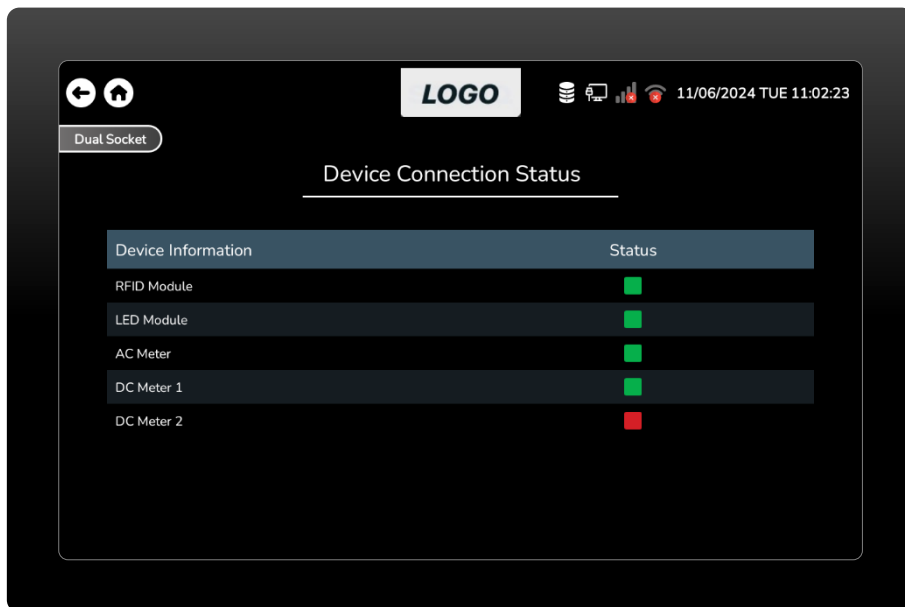




Figure 79 Device Connection Status Screen

Table 7 Device Connection Status Icon and Error

No.	Icon	Name	Function
1.		No Error	There is device connection status.
2.		Error	There is device connection error status.

#### 4.4.1.5 Charging History

- To get information about the previous charging history, press the charging history button. (Figure 80)

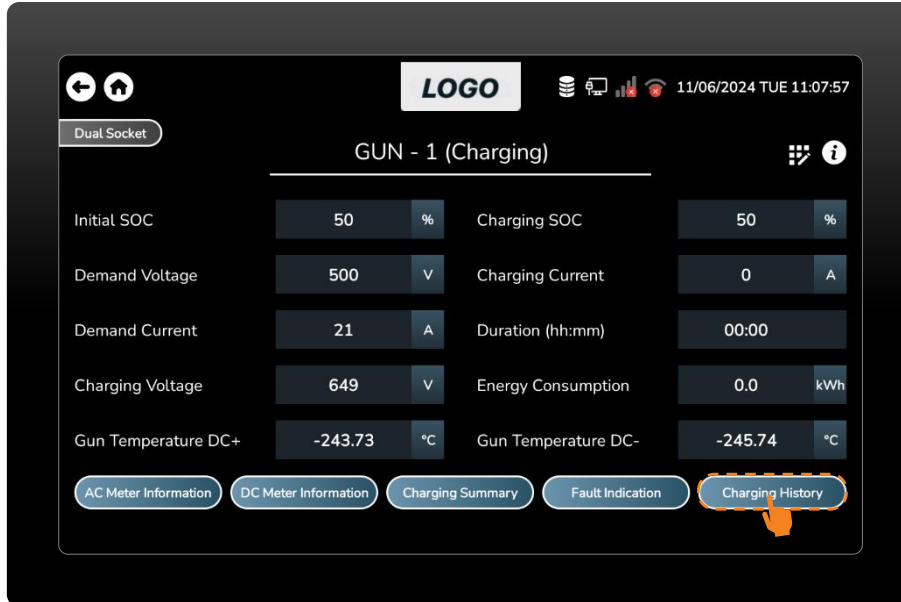


Figure 80 Press the Charging Summary Button.

- This is a GUN-1 charging history screen where the user can view previous charging history information such as the EV mac address, charging duration, charging start and finish dates and times, start and end SoC, energy consumption, session end reason, and total cost.
- The user can get the charge history in CSV format by clicking the download button. (Figure 81)

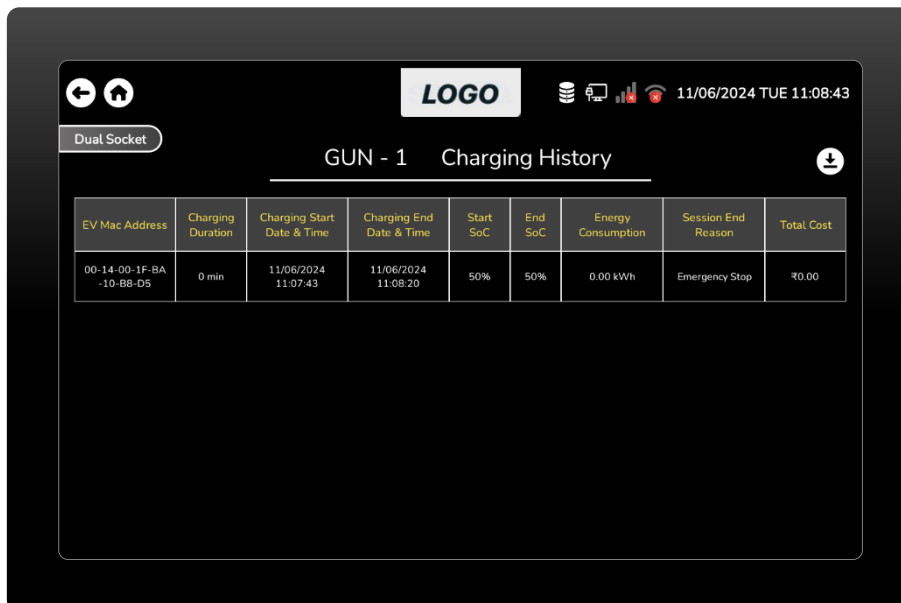


Figure 81 GUN-1 Charging Summary Screen.

## 5 Dual Socket

- This is a dashboard screen that allows the user to charge the vehicles with both GUN-1 or GUN-2. Follow the next section for a better understanding.
- To switch from single to dual sockets, press the dual socket button. (Figure 82)

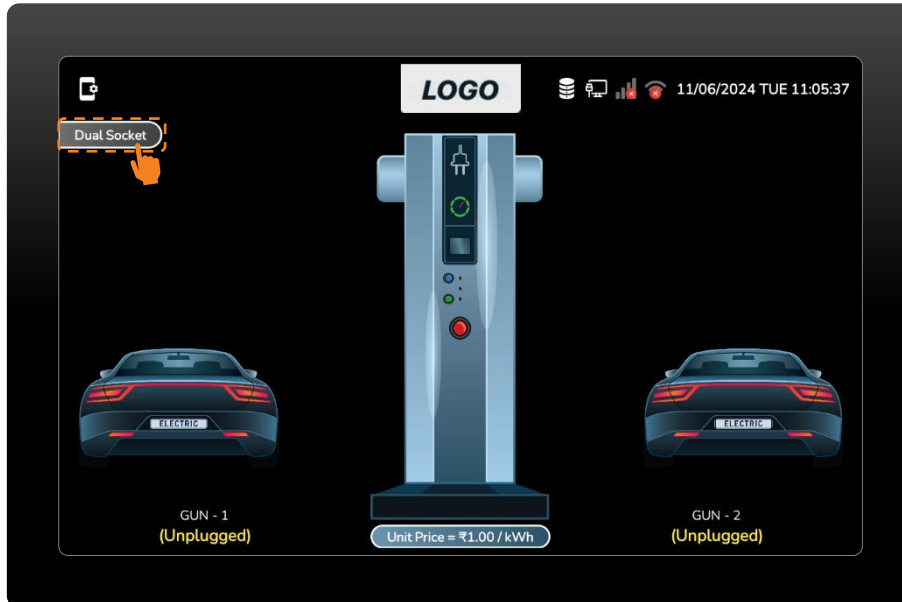


Figure 82 Dashboard: Switch to Single to dual Socket.

- To enable dual socket mode, the user must connect both guns plugged-in into the vehicles. (Figure 83)

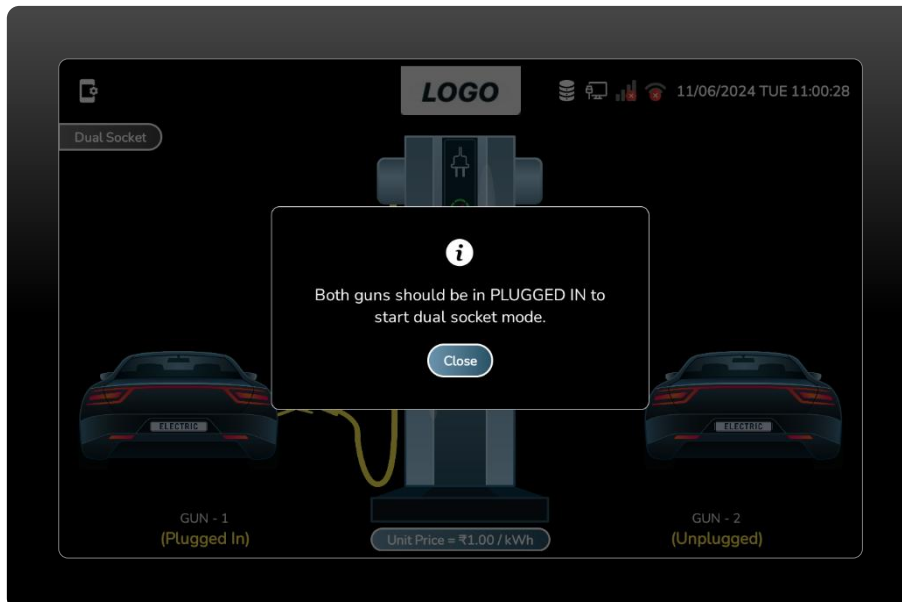


Figure 83 Both Guns Must Connect with Vehicles.

## 5.1 Dual Gun Plugged-In

- After plugging dual guns to vehicles and pressing the dual socket mode button, the user must provide permission to switch from single to dual socket mode by pressing the yes button. (Figure 84)

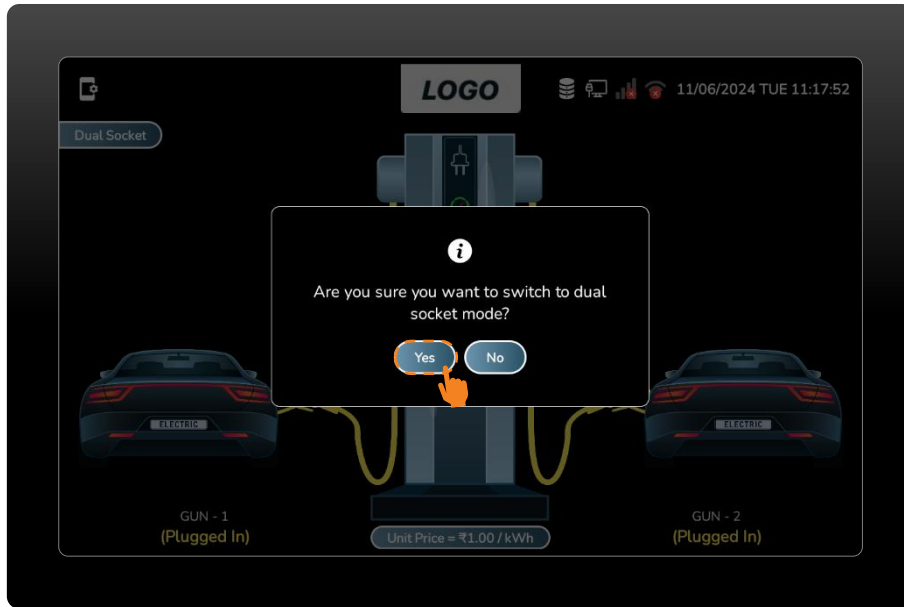


Figure 84 Press the Yes Button to Switch Dual Socket Mode.

## 5.2 Session Mode

- After successfully switching from single to dual socket mode, it will redirect to the charging session selection.
- The charging process allows four types of session modes: auto mode, time mode, SoC mode, and energy mode, which can be selected according on the requirements. (Figure 85)

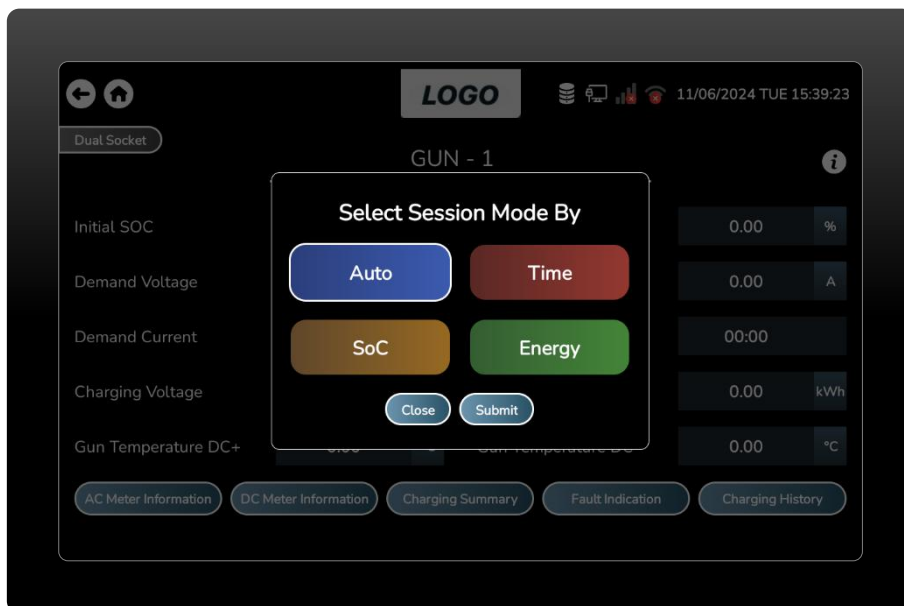



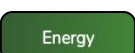




Figure 85 Select Session Mode.

Table 8 Session Mode Screen: Buttons and Functionality

No.	Icon	Name	Function
1.		Auto Mode	To set the charging session in default an ideal parameter.
2.		Time Mode	To set the charging session for a time period ranging from 1 to 999 minutes.
3.		SoC Mode	To set the charging session in the specified SoC from 1 to 100%.
4.		Energy Mode	To set the charging session for energy consumption ranging from 0.01 to 999.99 kWh.
5.		Close Button	Close the session selection mode.
6.		Submit Button	To submit the defined session mode.

### 5.2.1 Auto Mode

- This auto mode is set by default in session mode, where it uses an ideal parameter for charging the vehicle. (Figure 86)

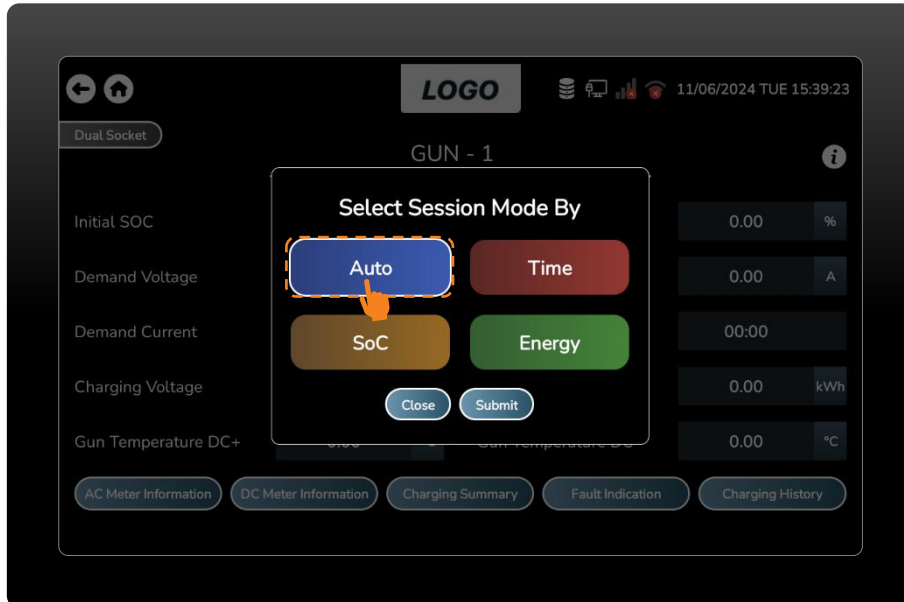


Figure 86 Auto Mode Select Mode.

### 5.2.2 Time Mode

- Time mode allows the user to specify a charging time ranging from 1 to 999 minutes, allowing the user to charge the vehicle at a certain time. (Figure 87)

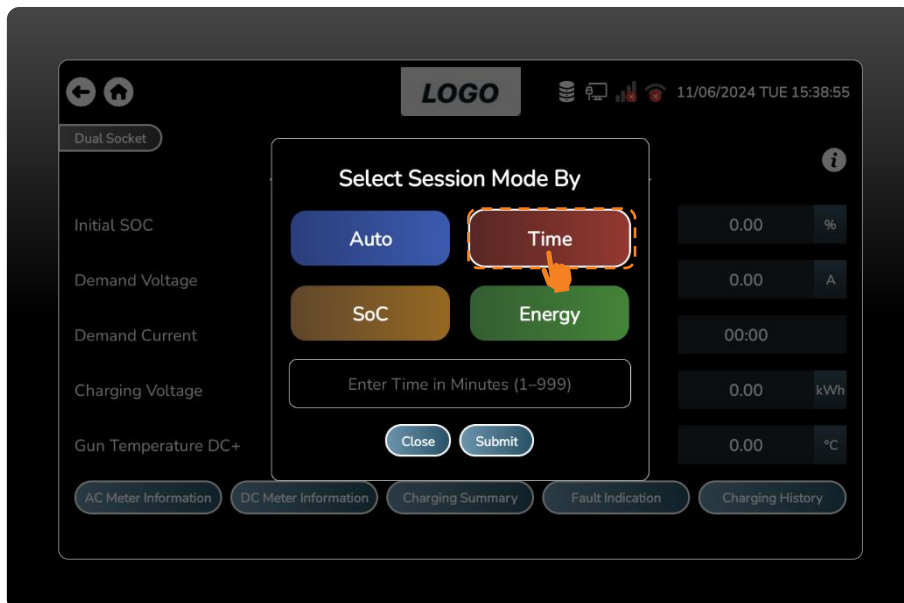


Figure 87 Time Mode Selection.

### 5.2.3 SoC Mode

- SoC mode allows the user to specify the state of charge, which ranges from 1 to 100%, allowing them to charge the vehicle at a certain percentage. (Figure 88)

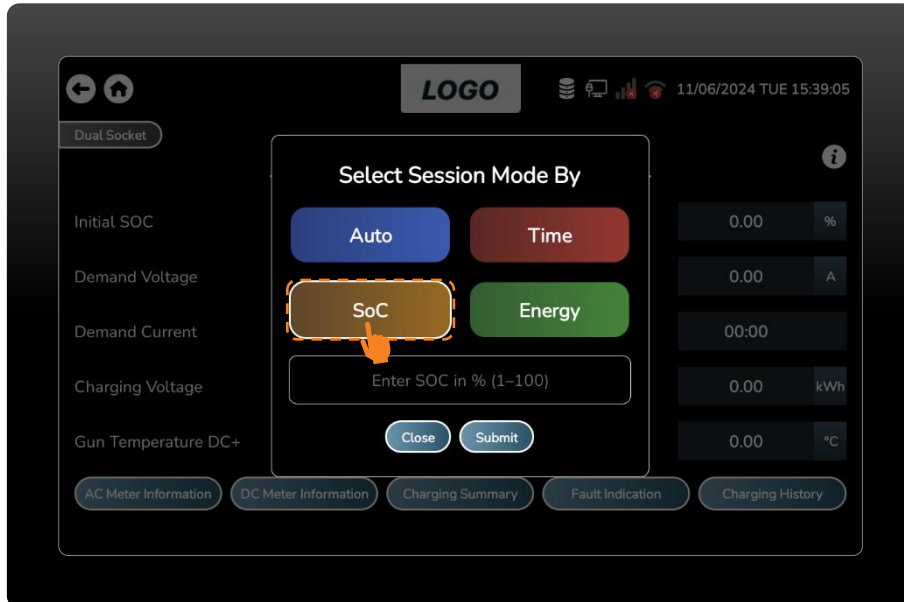


Figure 88 SoC Mode Selection.

### 5.2.4 Energy Mode

- Energy mode enables the user to choose the energy consumption, which ranges from 0.01 to 999.99, allowing them to charge the vehicle at a certain energy consumption. (Figure 89)

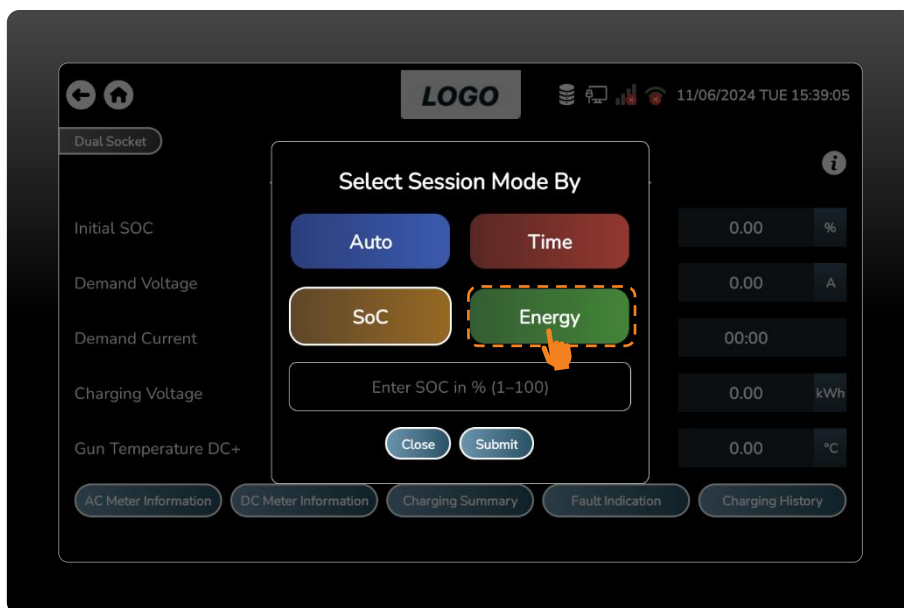


Figure 89 Energy Mode Selection.

### 5.3 Dual Gun Charging

- **User Authentication**

- To start the charging process, the user requires authorisation by tapping their RFID card, entering the OTP, or selecting the remote start option. (Figure 90)

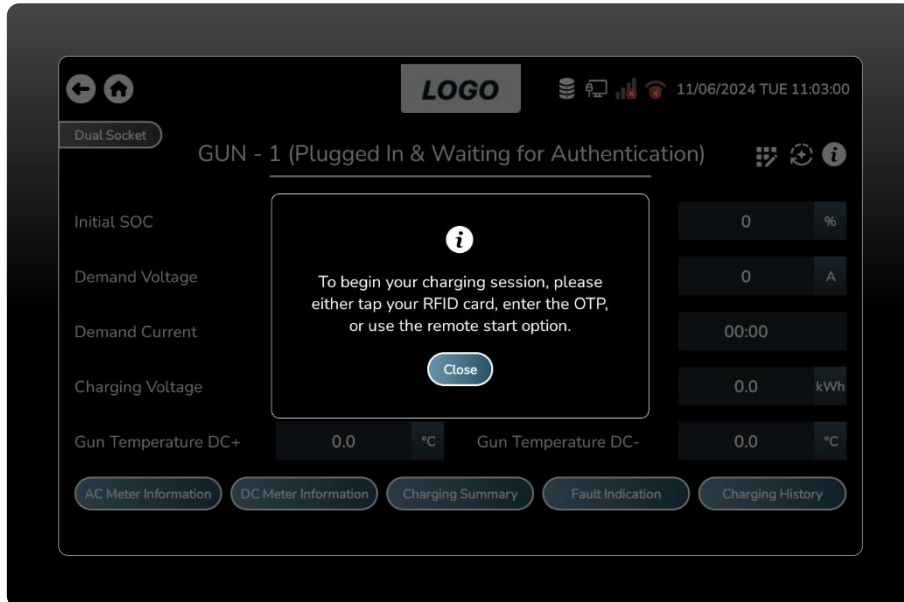


Figure 90 User Authentication Pop-Up Onscreen.

#### 5.3.1 Dual Gun Charging Screen

- This is the dual gun charging screen, where the user can view information about the present charging session. To learn more, see the table below. (Figure 91)

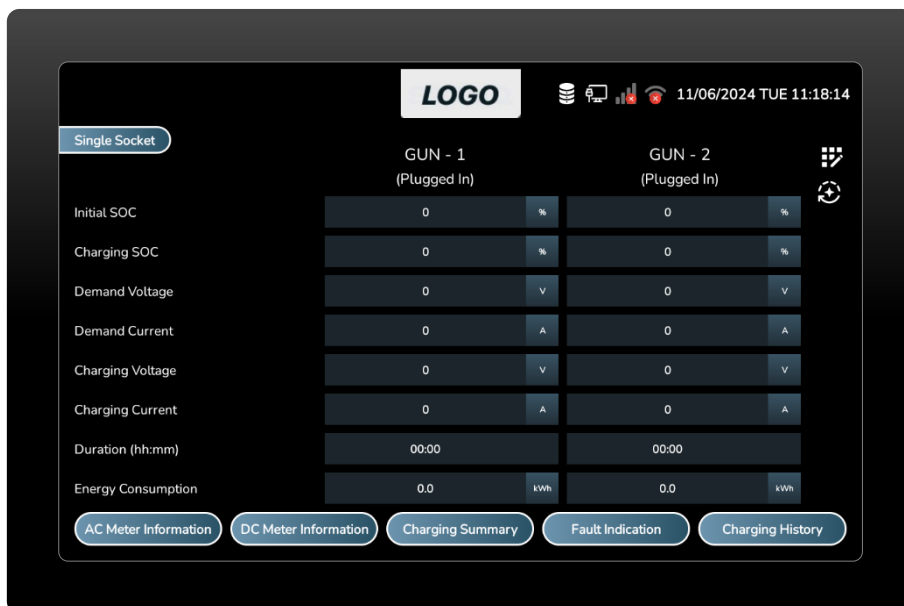






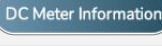
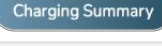
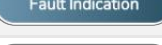
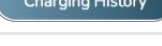


Figure 91 Dual Gun Charging Screen.

Table 9 Navigation Button: Dual Gun Parameter Screen.

No.	Icon	Name	Function
1.		Charge mode Button	To change selected charging mode.
2.		Info Button	To get information about user authorisation.
3.		Back Button	To move towards the back screen.
4.		Home Button	To move towards the dashboard screen.
5.		Dual Socket	To change a single socket to a dual socket.
6.		AC Meter Information	To get the AC meter information.
7.		DC Meter Information	To get the DC meter information.
8.		Charging Summary	To get the charging summary.
9.		Fault Indication	To get the fault indication information.
10.		Charging History	To get the previous charging history.

- **Charging Ongoing on Dashboard**

- After successfully user authentication, the user can view ongoing charging process from the dashboard with brief information about the ongoing charging process.

(Figure 92)

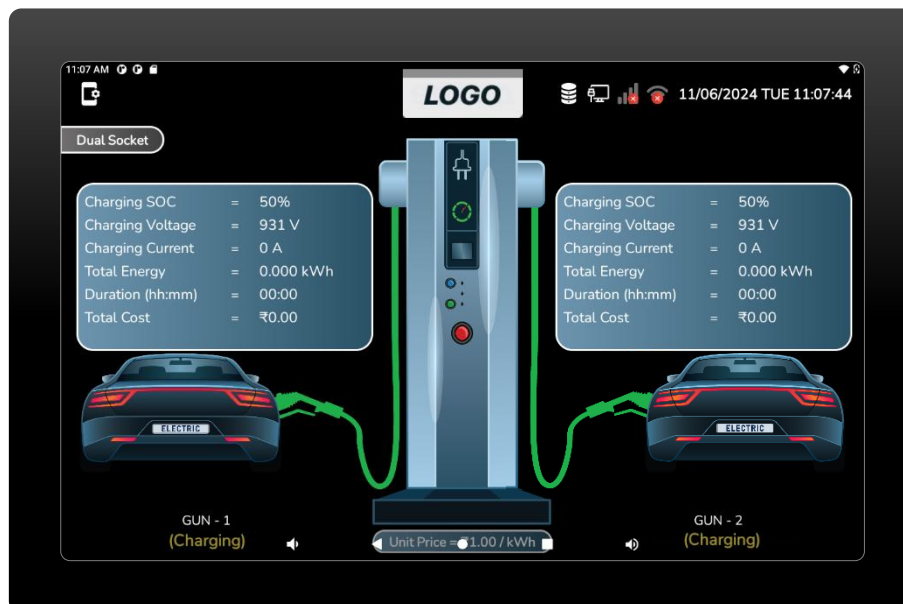


Figure 92 Dual Gun Ongoing Charging Process.

**5.3.1.1 AC Meter Information**

- To get information about the AC meter, press the AC meter information button. (Figure 93)

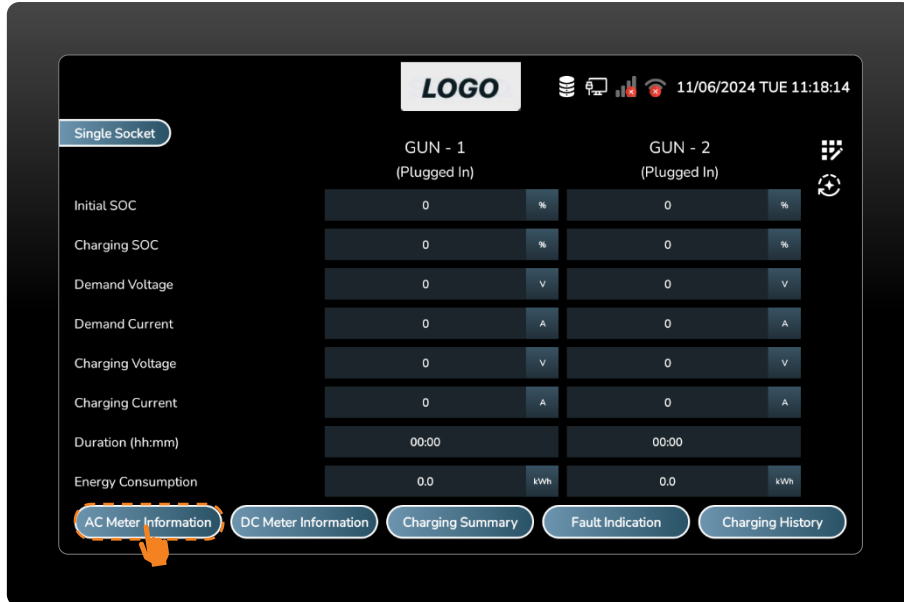


Figure 93 Press the AC Meter Information Screen.

- This is the AC meter information screen, where the user can view information such as voltages, average voltage, frequency, currents, average current, active power, and total export energy. (Figure 94)

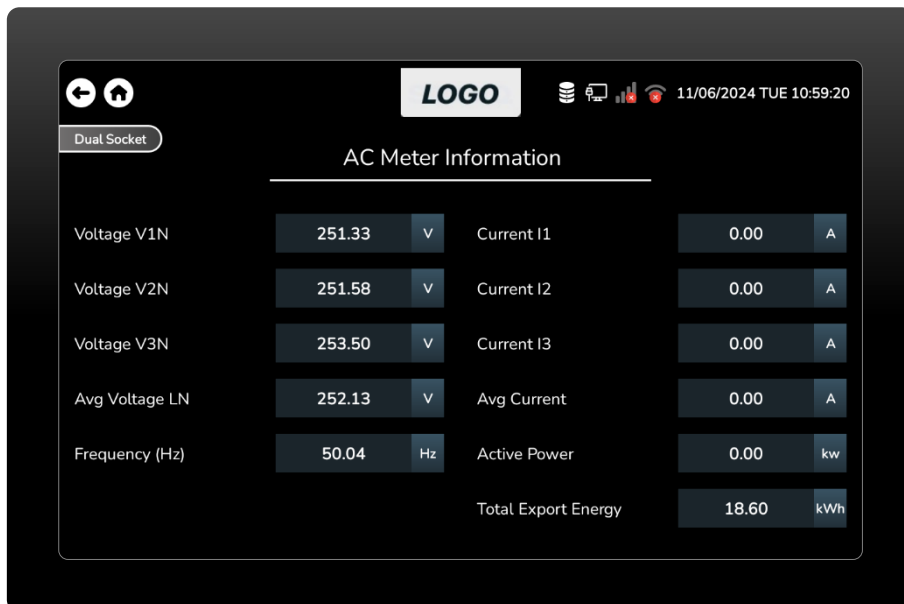


Figure 94 AC Meter Information Screen.

**5.3.1.2 DC Meter Information**

- To get information about the DC meter, press the DC meter information button.  
(Figure 95)

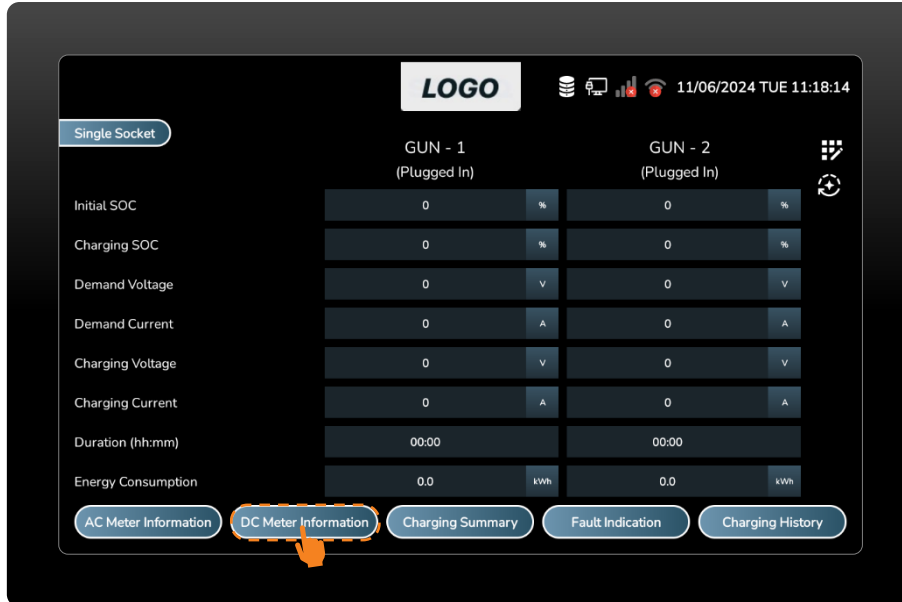


Figure 95 Press the DC Meter Information Button.

- This is the DC meter information screen, where the user can view information such as voltage, maximum voltage, minimum voltage, currents, maximum current, minimum current, power, import energy, and export energy. (Figure 96)

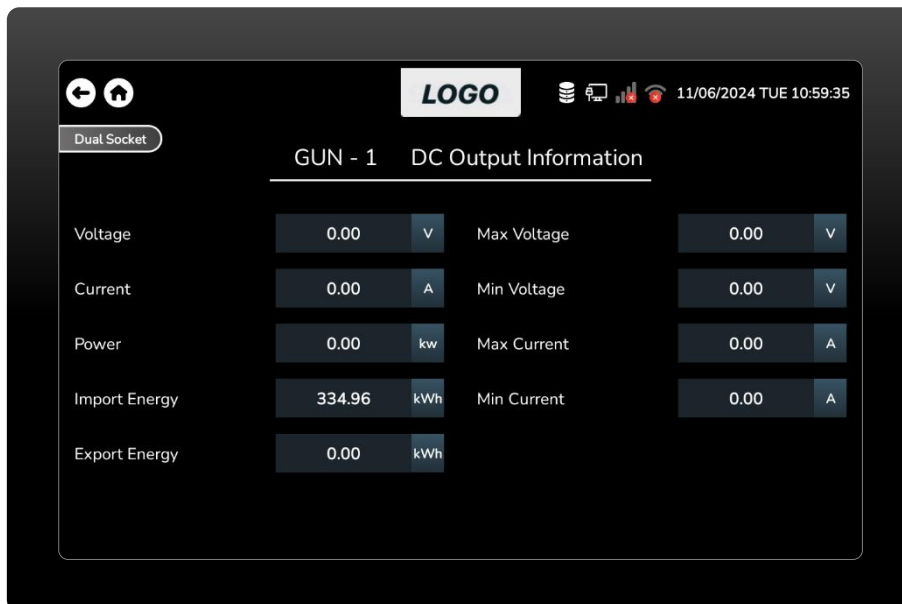


Figure 96 DC Output Information.

### 5.3.1.3 Charging Summary

- To get information about the charging summary, press the charging summary button. (Figure 97)

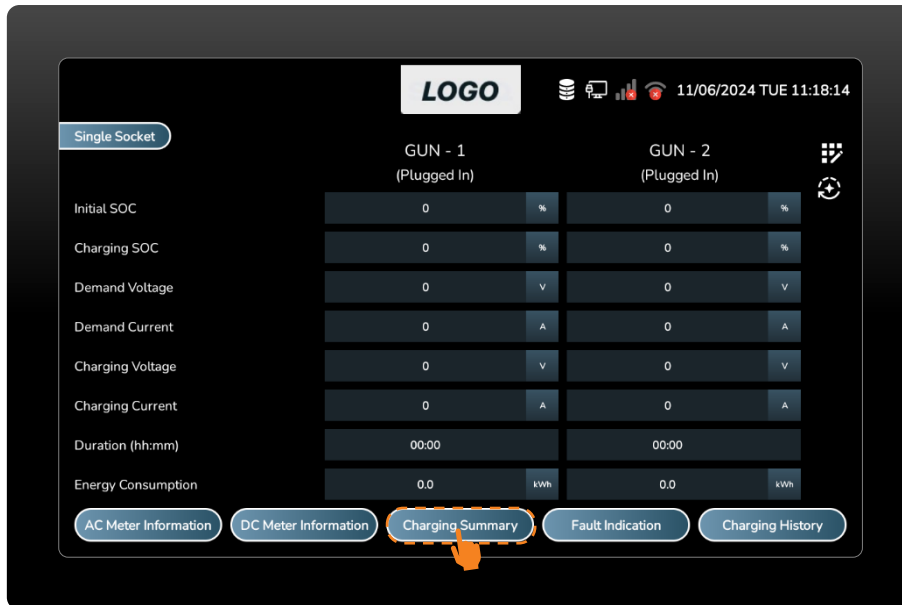


Figure 97 Press the Charging Summary Button.

- This is a GUN-1 charging summary screen where the user can view charging summary information such as the EV mac address, charging duration, charging start and finish dates and times, start and end SoC, energy consumption, session end reason, and total cost. (Figure 98)

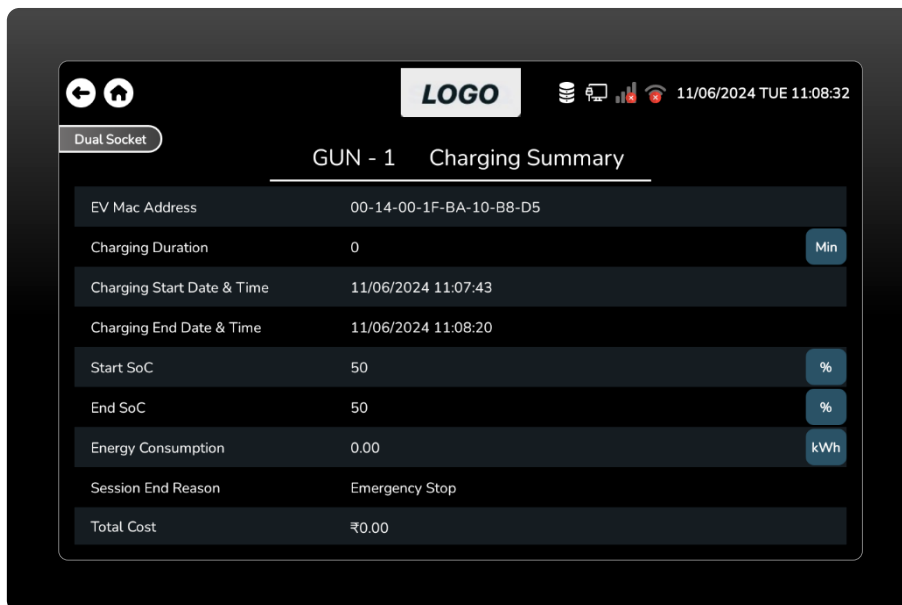


Figure 98 GUN-1 Charging Summary Screen.

### 5.3.1.4 Fault Indication

- To get information about the fault information, press the fault indication button.  
(Figure 99)

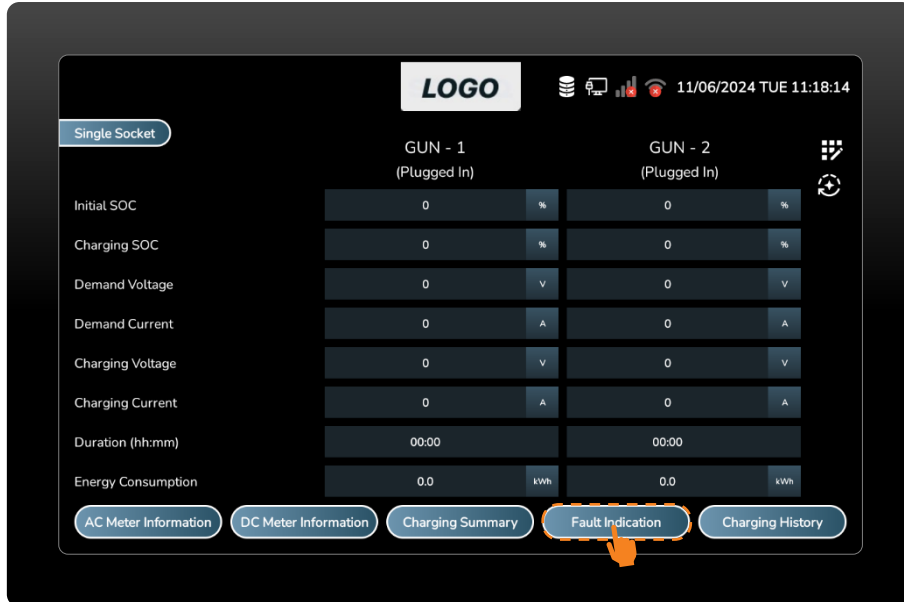


Figure 99 Press the Fault Indication Button.

- This is the fault information screen, where the user can view fault information for the PLC, rectifier, communication, and miscellaneous. (Figure 100)

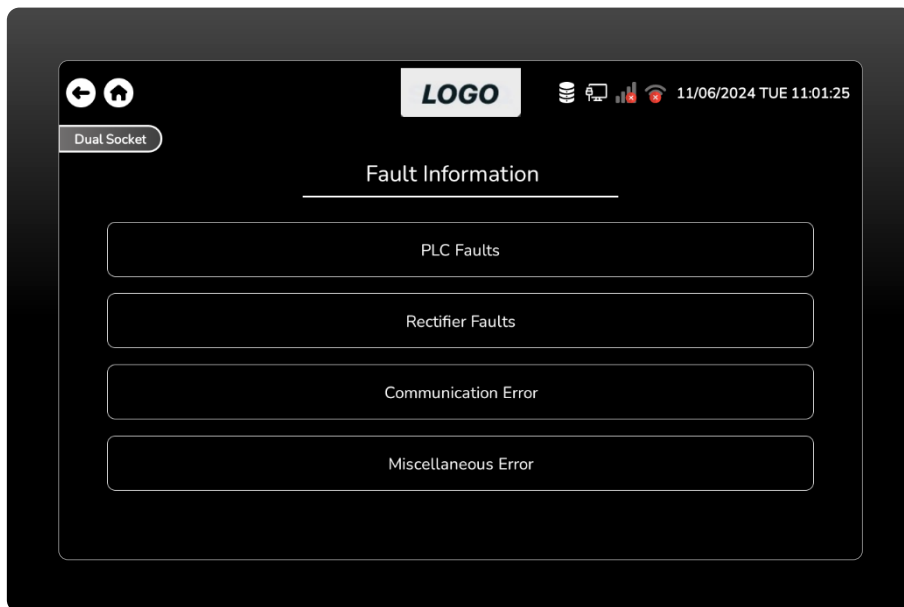


Figure 100 Fault Information Screen.

**A. PLC Faults**

- To get information about PLC faults, press the PLC faults button. (Figure 101)

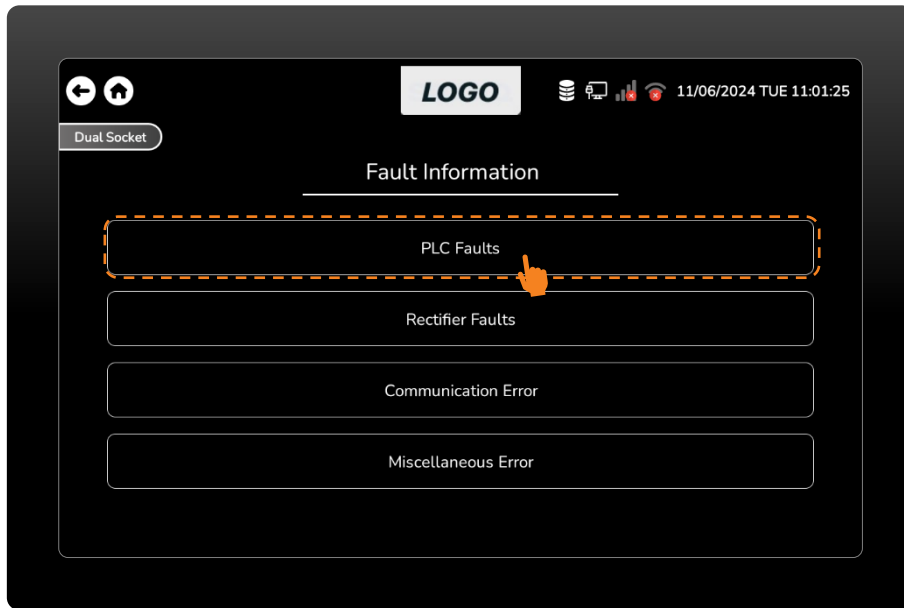


Figure 101 Press the PLC Faults Button.

- This is the PLC faults screen, where the user can view PLC faults for GUN-1 and GUN-2. (Figure 102)

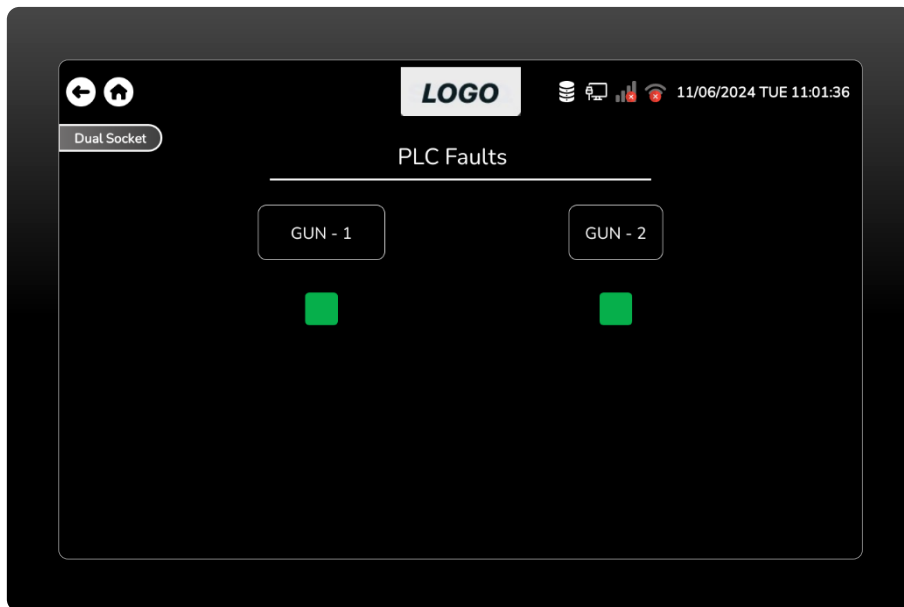




Figure 102 PLC Faults Screen.

Table 10 PLC Fault Icon and Error

No.	Icon	Name	Function
1.		No Error	There is no PLC error indicator.
2.		Error	There is a PLC error indicator.

## B. Rectifier Faults

- To get information about rectifier faults, press the Rectifier faults button. (Figure 103)

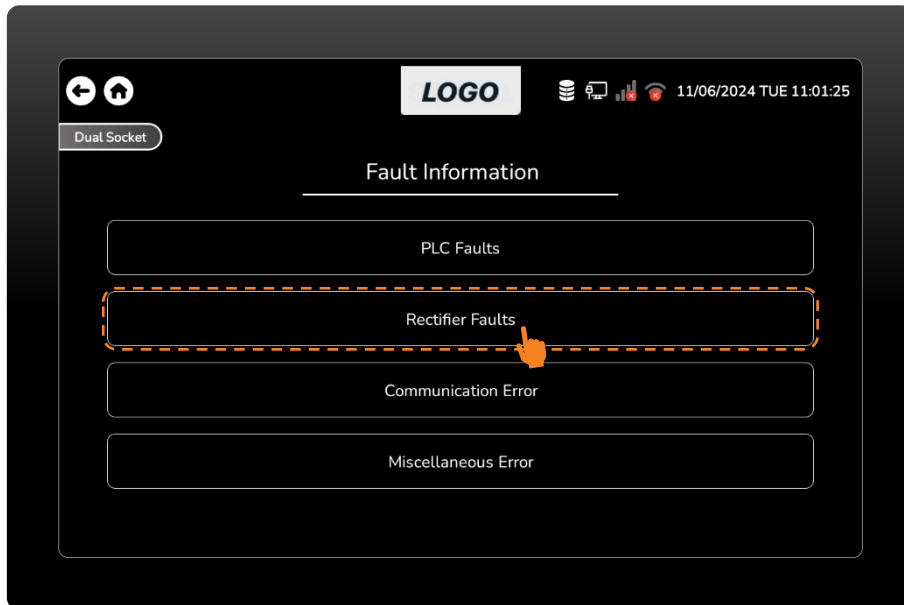


Figure 103 Press the Rectifier Faults Button.

- This is the rectifier fault information screen, where the user can view the error codes of rectifiers. (Figure 104)

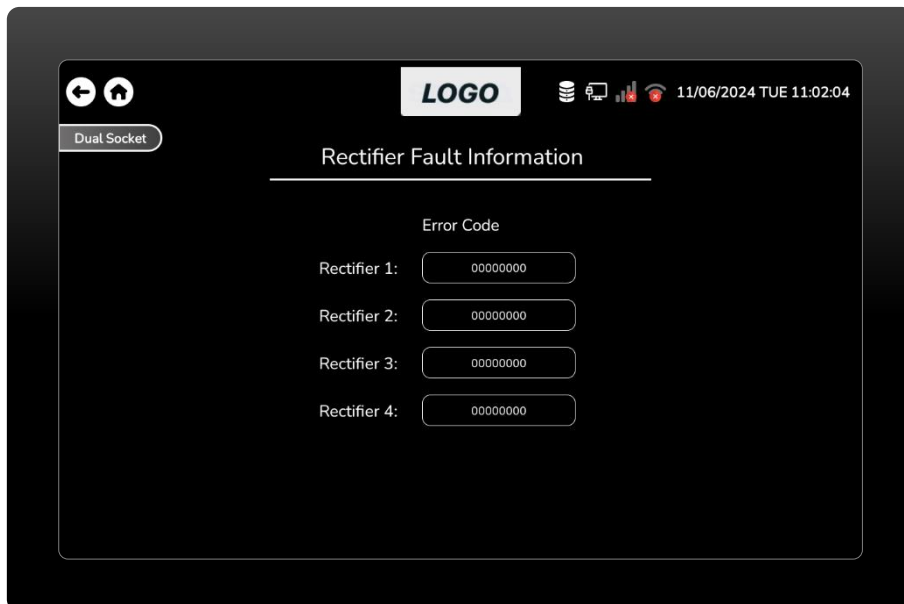


Figure 104 Rectifier Fault Information Screen.

**C. Communication Error**

- To get information about communication fault, press the communication error button.  
(Figure 105)

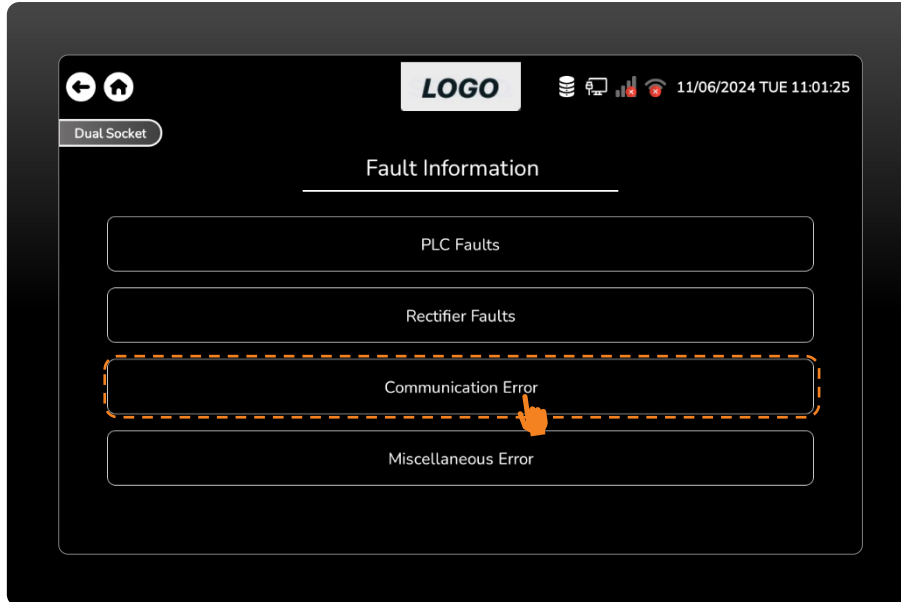


Figure 105 Press the Communication Error Button.

- This is the communication failure screen, where the user can view information about communication errors such as PLC, rectifier, OCPP, and Modbus master. (Figure 106)

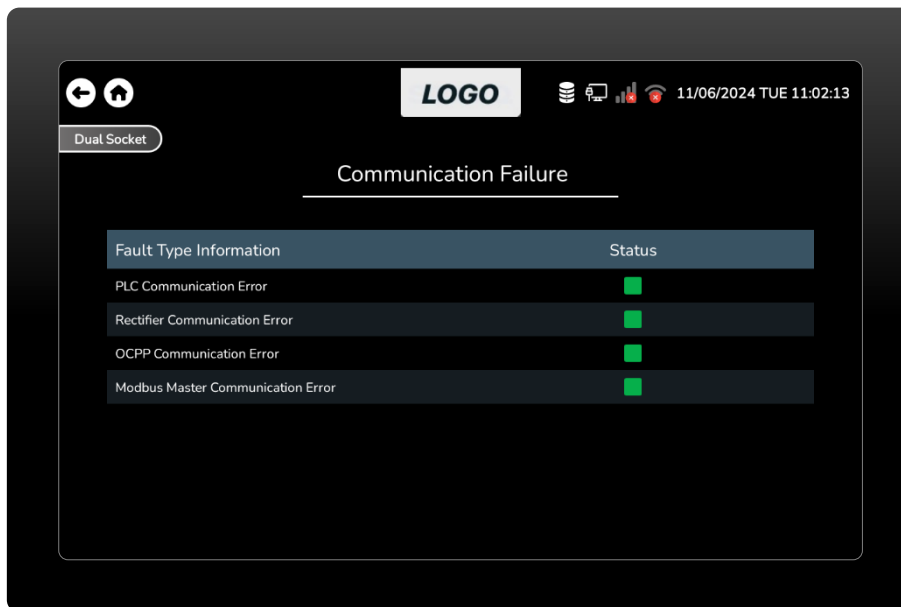


Figure 106 Communication Failure Screen.

Table 11 Communication Failure Icon and Error

No.	Icon	Name	Function
1.	Green	No Error	There is no communication failure status.
2.	Red	Error	There is a communication failure status.

**D. Miscellaneous Error**

- To get information about the device connection status, press the miscellaneous error button.  
(Figure 107)

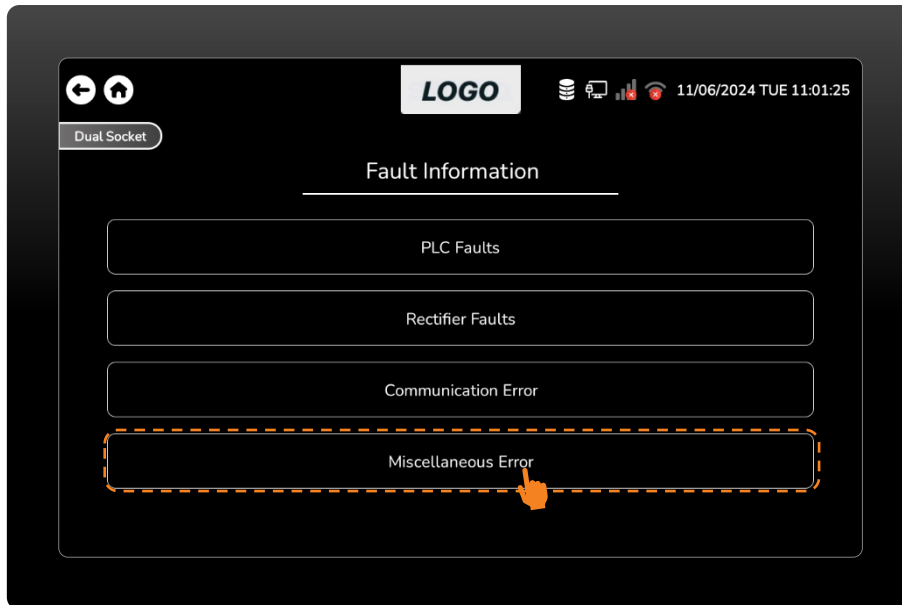


Figure 107 Press the Miscellaneous Error Button.

- This is a device connection status screen that indicates the status of devices such as RFID and LED modules, as well as AC, DC meters 1 and 2. (Figure 108)

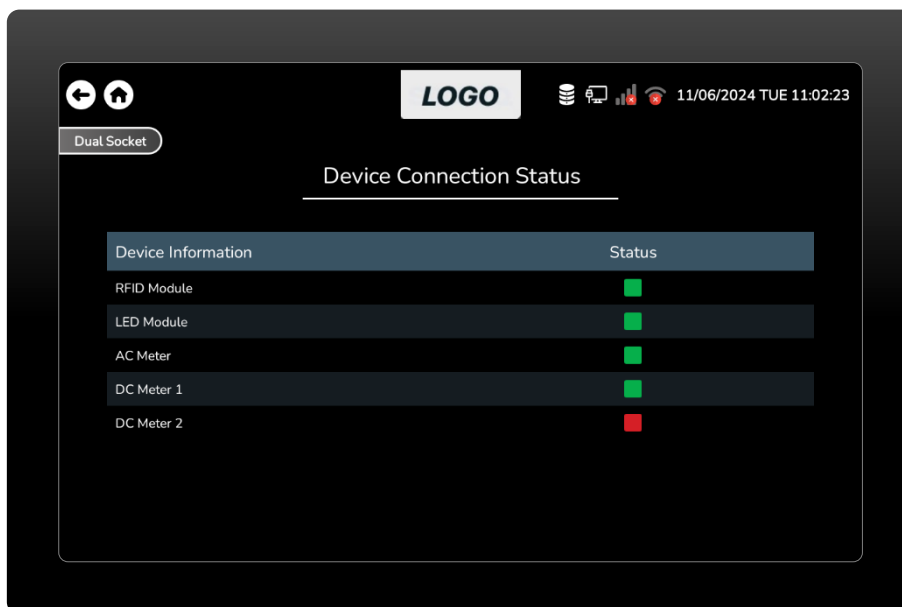




Figure 108 Device Connection Status Screen

Table 12 Device Connection Status Icon and Error

No.	Icon	Name	Function
1.		No Error	There is device connection status.
2.		Error	There is device connection error status.

### 5.3.1.5 Charging History

- To get information about the previous charging history, press the charging history button.  
(Figure 109)

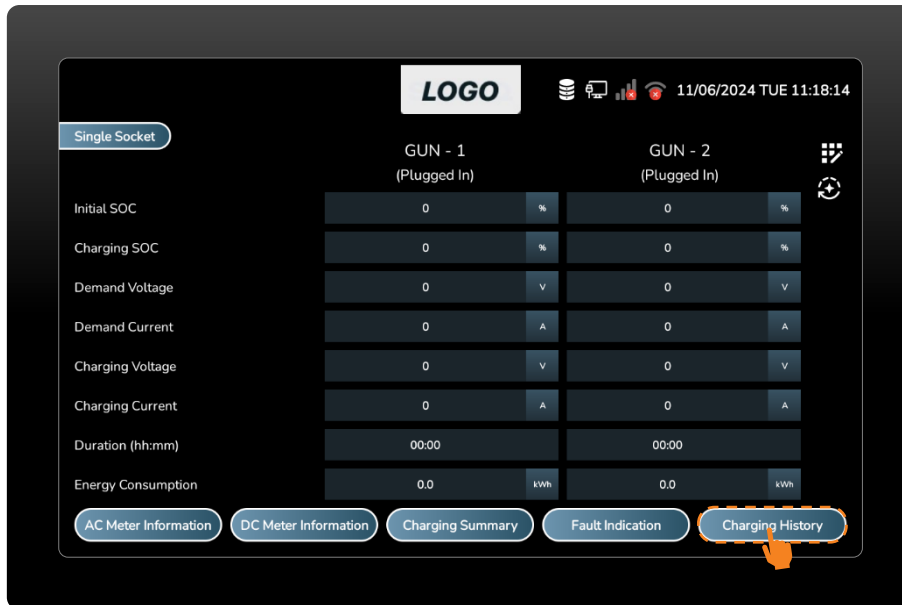


Figure 109 Press the Charging Summary Button.

- This is a GUN-1 charging history screen where the user can view previous charging history information such as the EV mac address, charging duration, charging start and finish dates and times, start and end SoC, energy consumption, session end reason, and total cost.
- The user can get the charge history in CSV format by clicking the download button.  
(Figure 110)

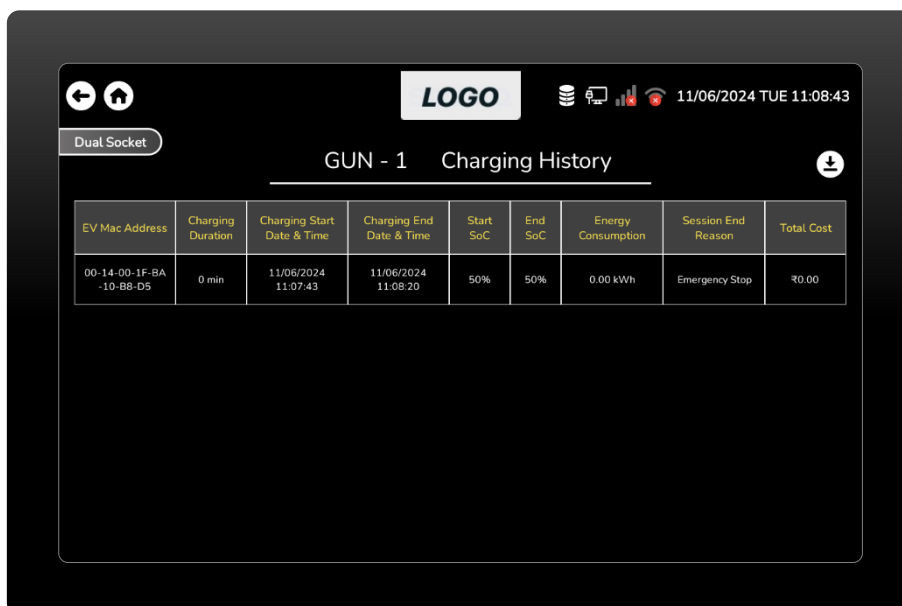



Figure 110 GUN-1 Charging Summary Screen.

## 6 Appendix


### 6.1 Abbreviations and Glossary


AC	<i>Alternating current, is a type of electrical current in which the current repeatedly changes direction</i>
CAN	<i>A controller area network (CAN) bus is a high-integrity serial bus system for networking intelligent devices. CAN busses and devices are common components in automotive and industrial systems.</i>
CCS2	<i>The Combined Charging System (CCS) is a standard for charging electric vehicles.</i>
COM	<i>COM (communication port) is the original, yet still common, name of the serial port interface on PC-compatible computers.</i>
DC	<i>Direct current (DC) is one-directional flow of electric charge.</i>
EV	<i>An EV is defined as a vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged from an external source.</i>
GSM	<i>GSM (Global System for Mobile communication) is a digital mobile network that is widely used by mobile phone users in Europe and other parts of the world.</i>
HMI	<i>Human Machine Interface.</i>
Hz	<i>hertz, the SI unit of frequency, is equal to one cycle per second.</i>
IP	<i>The Internet Protocol (IP) is the network layer communications protocol in the Internet protocol suite for relaying datagrams across network boundaries. Its routing function enables internetworking, and essentially establishes the Internet.</i>
kW	<i>Kilowatt (symbol: kW) is a unit of electric power.</i>
kWh	<i>A kilowatt-hour is a non-SI unit of energy equal to 3.6 megajoules in SI units which is the energy delivered by one kilowatt of power for one hour. Kilowatt-hours are a common billing unit for electrical energy supplied by electric utilities.</i>
LED	<i>A light-emitting diode (LED) is a semiconductor device that emits light when current flows through it.</i>
MCU	<i>The Motor Control Unit (MCU) is an electronic module that interfaces between the batteries (DC power sources) and the motor (AC or BLDC). Its main task is to control the EV's speed and acceleration based on throttle input.</i>

OCPP	<i>The OCPP (Open Charge Point Protocol) enables the integration of equipment from different manufacturers.</i>
OTA	<i>over-the-air update is a firmware or operating system update that is downloaded by the device over the internet.</i>
PLC	<i>Programmable Logic Controllers (PLCs) are industrial computers, with various inputs and outputs, used to control and monitor industrial equipment based on custom programming</i>
RFID	<i>Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify, and track tags attached to objects.</i>
SoC	<i>The state of charge (SOC) is a measurement of the amount of energy available in a battery at a specific point in time, expressed as a percentage.</i>
Wi-Fi	<i>Wi-Fi is a family of wireless network protocols based on the IEEE 802.11 family of standards, which are commonly used for local area networking of devices and Internet access, allowing nearby digital devices to exchange data by radio waves.</i>

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