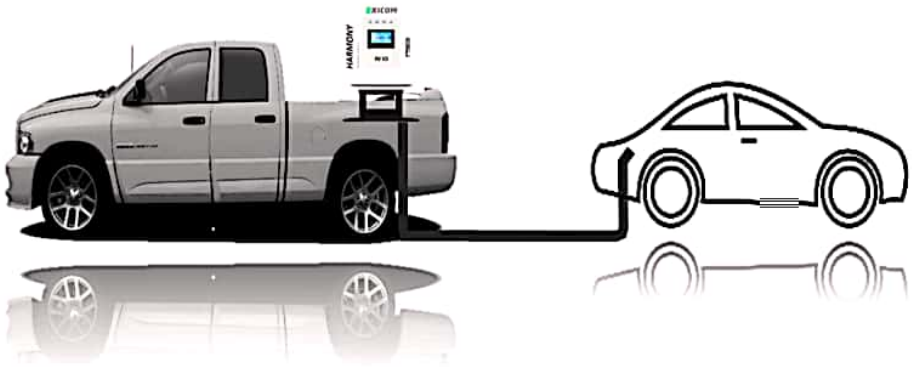
User Guide

Portable EV Charger-40kW



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EXICOM POWER SOLUTIONS

SECTION 1 EXICOM OVERVIEW

Founded in 1994, Exicom Tele-Systems is a company which operates in 3 key business area around vertical markets of EV Chargers, telecom and storage systems. We are a vertically integrated company with over 20 years of experience in designing, engineering and manufacturing products and solutions for need of today and future. Our corporate office is in Gurgaon (Near to New Delhi) and manufacturing facilities at Solan, Himachal Pradesh and Gurgaon, Haryana.

EXICOM's EV Chargers are equipped with high efficiency rectifier/SMR modules. We have EV solutions system configurations ranging from 1.1kW to 240kW. These EV chargers provide regulated power to electric vehicles. These EV chargers supports all types of charging protocols available worldwide.

Our EV Chargers are equipped with state-of-art technology controller cards with are user friendly LCD displays.

All the EV systems are housed in a cabinets and because of the modularity of the whole architecture the system is extremely flexible. A variety of combinations can be worked out to serve any kind of requirement and provision for future expansion.

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SECTION 3 INTRODUCTION

3.1 Preface

This document is valid for Portable EV Charger. The pictured devices used in this guide are visual examples. The figures and explanations contained in this guide refer to the typical device design. The devices used by you may differ in their appearance.

We recommend always keeping the charging station updated to the most recent software version, as this contains functional enhancements and product improvement.

3.2 Purpose of this guide

The document describes the user guide for Portable EV Charger.

*Note: *This document includes the latest information available at the time of printing. Exicom Tele-Systems Ltd. reserves the right to make changes to this manual or product without further notice. Changes, modifications, or repairs to this product by parties other than an authorized service provider could void the product warranty.*

SECTION 4 SAFETY MEASURES AND INSTRUCTIONS

EVDC type Portable Charger with battery backup is complied with IEC 61851-1 Safety Standard. All the components used in the Charger are certified components. The Charger complied with all the norms as per the safety standard. For user safety, all charging stations are equipped with a ground fault detector to reduce the risk of shock. Users are never exposed to dangerous voltages or currents, since connector pins are not energized until the connector is inserted properly in the EV charging socket and communication has been established between the vehicle and the charging station. In addition, the connector is sealed to protect the live components from the weather.

4.1 Representation of Safety Instructions

At various points in this document, you may notice notes and precautionary warnings regarding possible hazards. The symbols used have the following meaning:

Danger

Some components of the charger carry hazardous voltage in operation. Direct or indirect contact through moist objects with these components will result in fatal injury.

Attention

Means that damage to property can occur if the corresponding safety measures are not taken.

ESD

This symbol reminds you of the possible consequences of touching electrostatically sensitive components.

Ground Protection

This symbol reminds you of that the equipment is properly grounded.

4.2 Prohibited areas

Any non-company's technical personnel or non-company's authorized technical personnel do not open the cover, otherwise, you will have the risk of electric shock, and lose the warranty qualification.

4.3 Safety Precautions

- Make sure that the equipment is well-grounded to avoid electric shock before opening the equipment.
- Do not modify, add, or alter any part of this product without consulting the backend team.
- Please make sure the input voltage, frequency and other conditions have conformed to equipment requirements before power on.
- To ensure the service life of the equipment and stable operation, the equipment shall not be used in volatile gas or flammable environment.

4.4 Do's & Don'ts

- **Do not** touch any live part in the system while when the system is ON.
- **Do not** make any changes in the system without consulting the backend team.
- Please turn off the switch when battery is not charging and discharging in order to reduce power consumption.
- Please check if all the connectors are connected well before using Battery Packs.
- Please be very careful while using Switch Box. Please read instruction before using.
- Use Protection Gloves when doing diagnostic or maintenance of System.
- **Don't open** the Battery cabinet.
- **Don't open** Junction Box.
- **Don't** provide battery charging current more than 25A.
- **Don't** provide charging current more than 50A, while charging vehicle.
- **Don't** open the charger when it is in operating mode.
- **Don't** keep batteries in High Temperature and Moisture area.
- **Don't use** of sharp objects to operate Touch LCD of Charger.

4.5 Required tools

- Multimeter, Clamp meter.
- SD Card, U-Drive.
- USB-RS232 serial tool, USB-UART serial tool.
- LAN Cable, IXXAT CAN Converter, LAPTOP.

SECTION 5 ABBREVIATIONS

While reading this document you might see few abbreviations as mentioned below,

S. No	Abbreviations	Full Forms
1	EVSE	Electric vehicle supply equipment
2	EVDC	Electric vehicle direct current
3	EVAC	Electric vehicle alternating current
4	EV	Electric Vehicle
5	A	Ampere
6	Ah	Ampere hour
7	MCB	Miniature Circuit Breaker
8	MCCB	Molded Case Circuit Breaker
9	Comm.	Communication
10	CAN	Controlled Area Network
11	SMR	Switch Mode rectifier
12	SOC	State of health
13	kWh	Kilo Watt hour
14	DC	Direct Current
15	CCS	Combined Charging System
16	CHAdeMO	Charge de Move
17	Batt.	Battery
18	USB	Universal Serial Bus
19	VAC	Voltage Alternating current
20	VDC	Voltage Direct Current

SECTION 6 PRODUCT OVERVIEW

Exicom Portable Charger is combination of industrial standards and advanced charging technology to support next-generation electric vehicles. It's multi-protocol design allows for easy tailoring to support CHAdeMO, CCS and GB/T connectors for DC fast charging.

The system is designed to operate on AC input and DC input both. The solution have battery backup which support charging of dead vehicles for road services applications.

6.1 System Dimensional Information

Below given is the system dimensional information for Portable system.

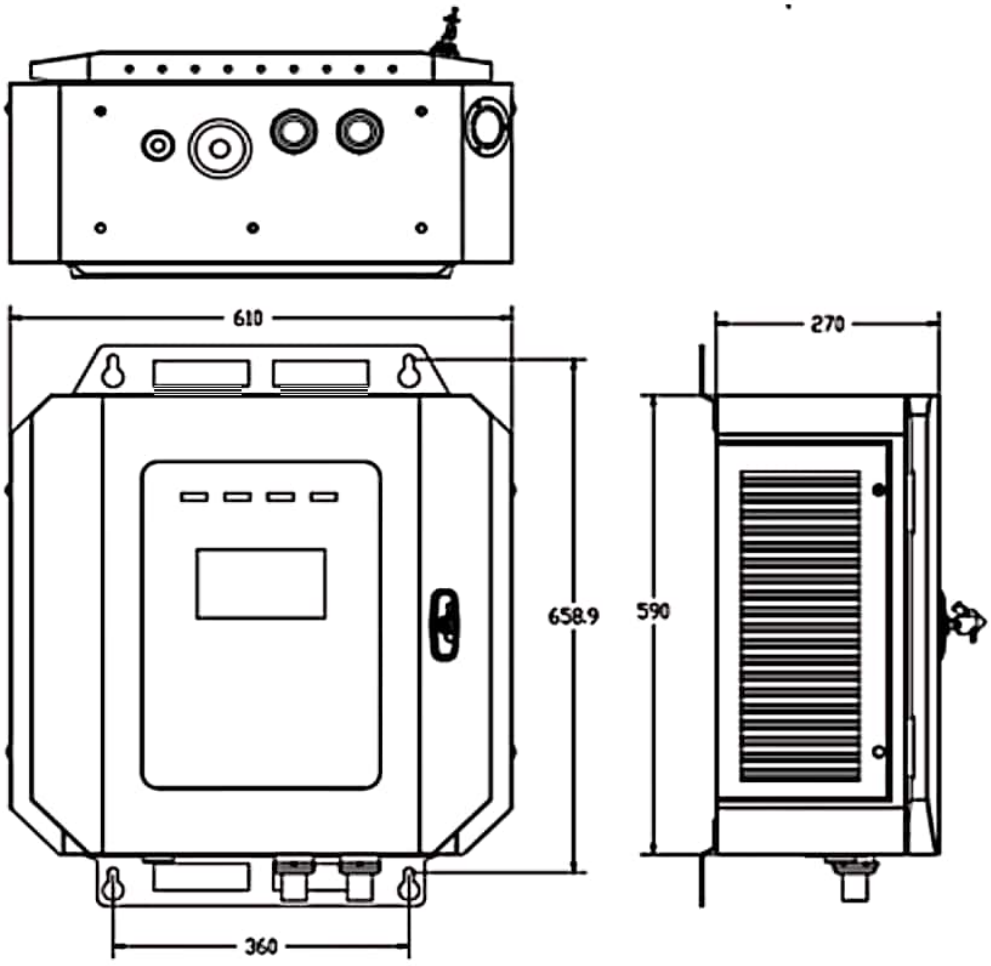
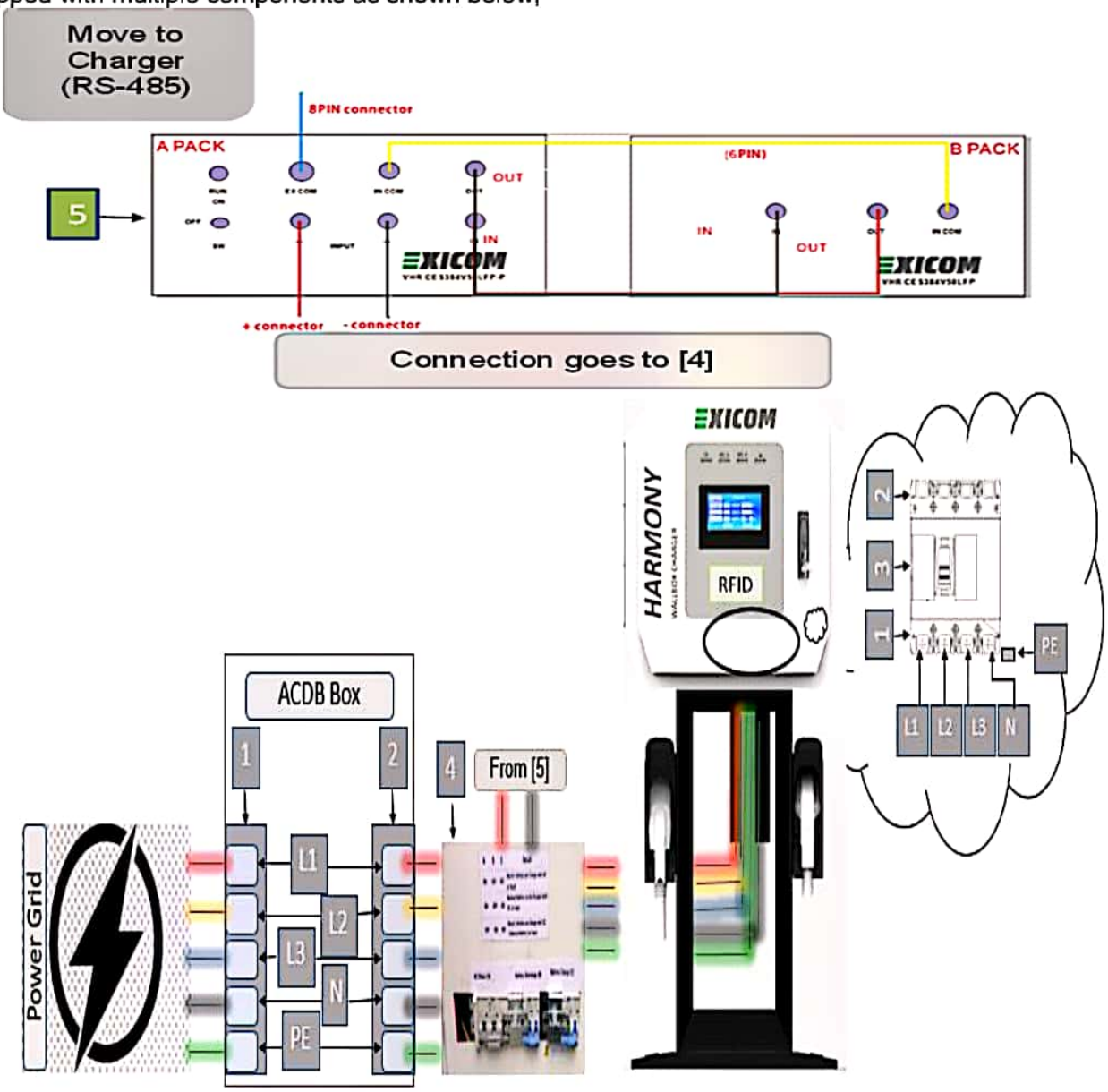


Figure 6.1 (a) Charger Dimension

6.2 System Architecture

Portable– Fast charger solution is Exicom's most innovative design and a true representation of interoperability. The Portable system has two connectors – CCS 2, CHAdeMO 1.2. The charger is equipped with multiple components as shown below,



[1]	AC Input	**[2]**	AC Output
[L1]	Mains Connection Phase Conductor 1	**[L2]**	Mains Connection Phase Conductor 2
[L3]	Mains Connection Phase Conductor 3	**[N]**	Mains Connection Neutral Conductor
[PE]	Mains Connection Earthing Conductor	**[3]**	MCCB (4P)
[4]	Junction Box	**[5]**	Battery Backup

6.3 Technical Specifications

Input parameters	Input Voltage	415VAC; 3-phase / L1, L2, L3,N, PE
	Input Voltage Range	320VAC to 520VAC
	Input Frequency Range	45Hz - 60Hz
	Power Factor	>0.98
	Efficiency	>94%
Output Parameters	Max. O/P power	40kW
	O/P Voltage	200-750 VDC
	O/P Current	100 A
	No. of Output	2
Communication	Network interface	Ethernet (standard); 3G/4G (optional) - OCPP v1.6 (Optional)
Environmental	Operating Temperature	0°C to 75°C (derating from 55°C)
	Storage Temperature	-20°C to 80°C
	Humidity	5% to 95% non-condensing
Mechanical	IP Rating	IP 54
	Cooling	Forced cooling
	Dimension (H x W x D)	590*610*270 (mm)
Distinguish Features	Charging Cable length	>4.5 meter (standard)
	Interface	7" Touch Screen LCD
	Charging Mode	Mode 4 for DC charging
	User Authentication	RFID/APP/OTP/QR (as per requirement)
	Simultaneous operation	N.A
	Charging Operation	Cyclic Mode
	Charge options	Auto Charge, Mode Selection (Time/Amount/Power/SOC)
	Protections	Over current, Under voltage, Over voltage, Residual current, Surge protection, Short circuit, Over temperature, Ground fault, Insulation fault, Emergency Stop etc

6.4 Key features

Below mentioned are the key features of this charger,

- Complies with IEC61851 International EV Charger standards.
- Highly modular and compact design.
- Built in 7 inches LCD touch screen & RFID for user interaction.
- Mobile application compatibility (optional).
- User-friendly and interactive design for domestic and public applications.
- Easy installation.
- Robust for all weather conditions with IP 54 protection.
- OTA software updates.

6.5 Control Card

The combination of pilot controller and upper controller card is heart of the EV charger and it controls the system's overall functionalities. The backend OCPP server communication and user interface display is controlled by the upper controller whereas the CCS, CHAdeMO, charging communication is controlled by the pilot controller card.

Basic Pilot control card's function,

- Electric vehicle communication with ISO/DIN protocol as per CCS 2 standards.
- Electric vehicle communication with CHAdeMO protocol as per CHAdeMO standards.
- SMR/Rectifier communication and control.
- AC/DC output switching control.

Basic Upper control card's function,

- OCPP server communication.
- User interface display control.
- AC/DC metering control.
- RFID board communication.

6.6 MCCB & RCDs

As per the system requirements dedicated MCCB, MCB are RCBO are used for protections of the system as per safety standards decided by IEC61851 EV Charging standards.

6.7 SPD

The EV Chargers are equipped with Class C SPD which provides protection against sudden impulse in the input supply. It grounds any voltage impulse above its rated capacity.

6.8 Rectifier/SMR Module

EV series high efficient rectifier/AMR modules are designed to operate on AC & DC for powering electric vehicles. They are high efficiency converters with nearly unity power factor. The output range is from 200V-750VDC.

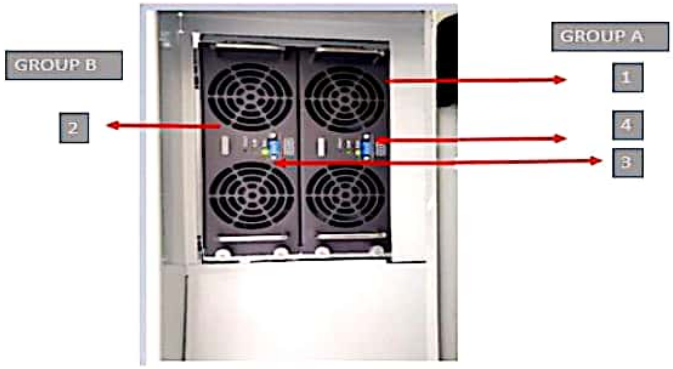


Figure 6.5 (a): SMR/Rectifier Module of charger

SMR LED Indications

Indicator Light	Normal State	Abnormal State	Cause of Abnormality
Operation indicator Light (Green)	ON	OFF	Input power not available
		Flash	Communicating with the system's controller
Alarm indicator Light (Yellow)	OFF	ON	AC input overvoltage, Internal over-temperature, Abnormal bus voltage (self-recovery if alarm is cleared)
		Flash	Communication failed with system's controller
Fault indicator Light (Red)	OFF	ON	Output overvoltage, Output short circuit, Internal address conflict and Internal bus fault
		Flash	Fan Fault

Efficiency Vs output load graph

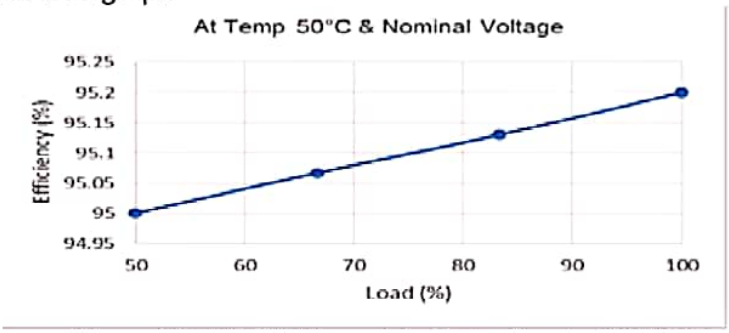


Figure 6.5 (b): Efficiency Vs Output load of SMR Module

6.9 Junction Box

Junction Box is used for selection of configuration in which we use the charger

1) **When AC Mains is available and Battery packs are at low SoC**: in this configuration of charger we use AC mains as input of charger and output of charger will charger the battery pack.
2) **When EV Assurance Vehicle is at the field and needs to charge an EV with low SoC**: In this configuration the charger will use the input from Backup batteries and output of charger will charge the vehicle.
3) **When EV Assurance Vehicle is at Station and EV with low SoC is present there**: Here, In this configuration the charger will charge the vehicle using AC mains.

Note: Refer section 10.4 for MCB configuration in Junction box.

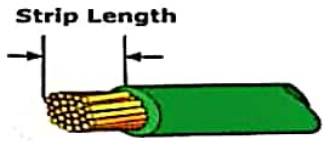
6.10 Backup Battery

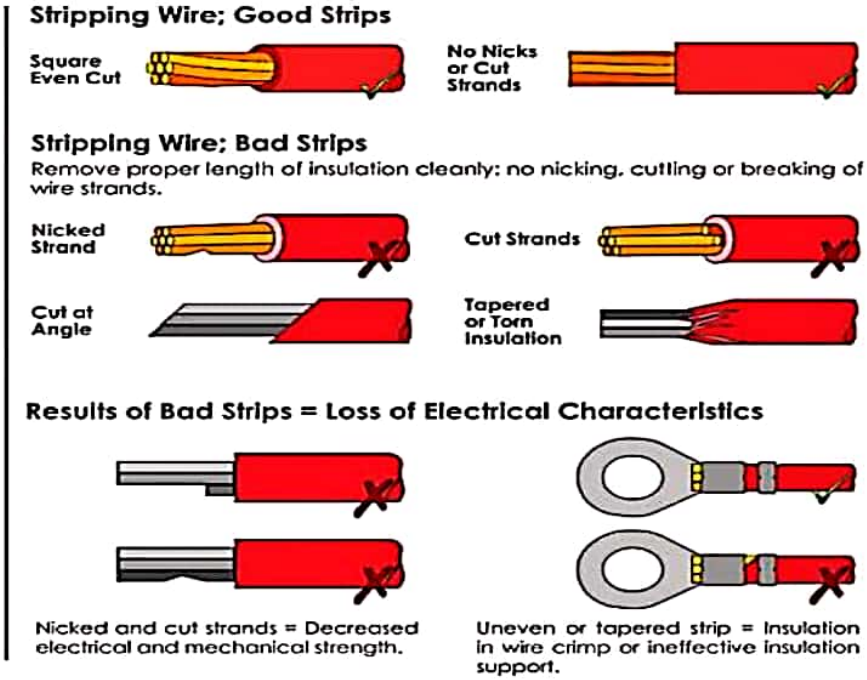
Battery packs are used to provide power to charger during charging of vehicle with low SoC and no AC mains is present. We can recharge these battery pack using AC mains as input to charger and output to backup battery.

Figure 6.10 (a): Backup Batteries

SECTION 7 INSTALLATION INSTRUCTIONS

The Portable EV chargers are designed to be installed on the Vehicle. Proper installation is absolutely necessary and to be conducted as per the below details,





WIRE STRIPPING INSTRUCIONS

Caution:

Copper lugs are to be used at site refer Annexure-I for details.

Use of lugs and cable as per Exicom guidelines else Exicom is not responsible for any damage.

7.1 Required Installation Tools

The following tools are required for the electrical installation,

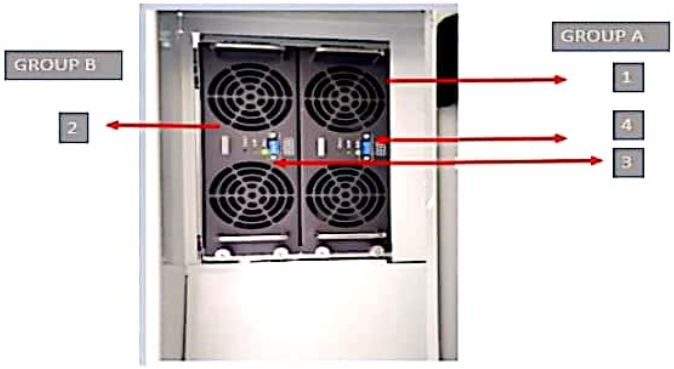
- Phillips head screwdriver. (Refer for ANNEXURE-I for size)
- Mounting tools for cable screw connection. (Refer for ANNEXURE-I for size)
- Cable Crimping tools.
- Multi-meter.
- Clamp-meter.
- Screwdriver set.
- Allen key set.

7.2 Input Power & Cable for charging Backup Batteries

S. No.	Item	Specifications
1	AC Supply System	3-Phase, 5 Wire AC system (3Ph+N+E)
2	Nominal Input voltage	3Ø, 415VAC (Range: 320VAC to 520VAC)
3	Input Frequency	50Hz
4	Input Power	45KVA
5	Neutral to earth Voltage	<1.0 VAC

7.3 Rectifier Installation

- Gently insert the Rectifier in the Rectifier slot to ensure proper connectivity with the connector.
- Once Rectifier is inserted Properly, Rectifier will get registered automatically.
- After that Set the addressing in the Rectifier if required.(Refer Annexure-1)



[1]	Rectifier 1 (Group A)	[2]	Rectifier 2 (Group B)
[3]	LED Indication (Refer Clause no. 6.8 LED indication	[4]	Addressing Refer Annexure II for Rectifier DIP Switch configuration

7.4 Battery Pack

7.4.1 Battery Packs Information

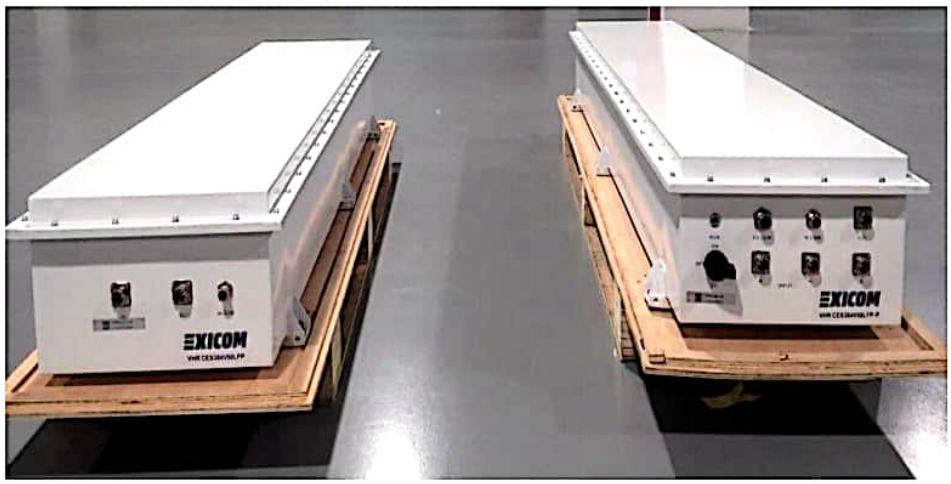


Fig no.7.4.1 (a): Battery pack

Fig no.7.4.1 (b): Battery Pack (Master) connection Port

Sr No	Name	Remark
1.	"RUN"	Operation Indication Light.
2.	"EX COM"	Communication port with charger.
3.	"IN COM"	Communication port between two packs.
4.	"OUT"	Power cable connection port between packs.
5.	"IN"	Power cable connection port between packs.
6.	"INPUT+"	Power cable connection port with Charger.
7.	"INPUT-"	Power cable connection port with Charger.

Fig no.7.4.1 (c): Battery Pack (Slave) connection Port

Sr No.	Name	Remark
1.	"IN"	Power cable connection port between packs.
2.	"OUT"	Power cable connection port between packs.
3.	"IN COM"	Communication port between two packs.

7.4.2 Battery Pack Installation& Connection

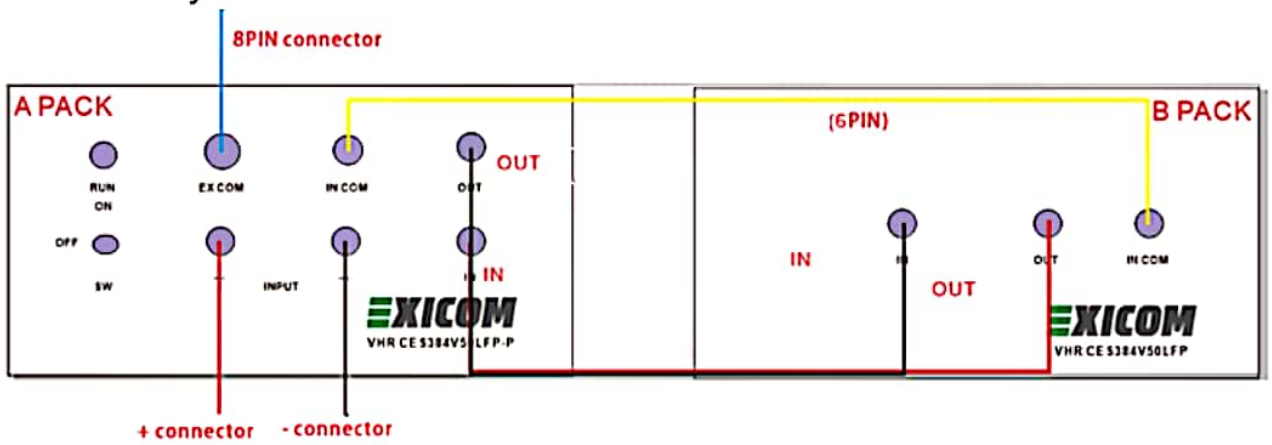


Fig no.7.4.2 (a): Battery Pack connection

- Installation Battery packs LOGO side face to vehicle, PACK A installed on left side and Pack B on right side.
- "INPUT-" port to connect with charger negative terminal. Connector is provided by HRESYS.
- "INPUT+" port to connect with charger positive terminal. Connector is provided by HRESYS.
- "EX COM" port to connect with charger RS485. 8pin connector is provided by HRESYS.

7.4.3 Battery Pack Interconnection

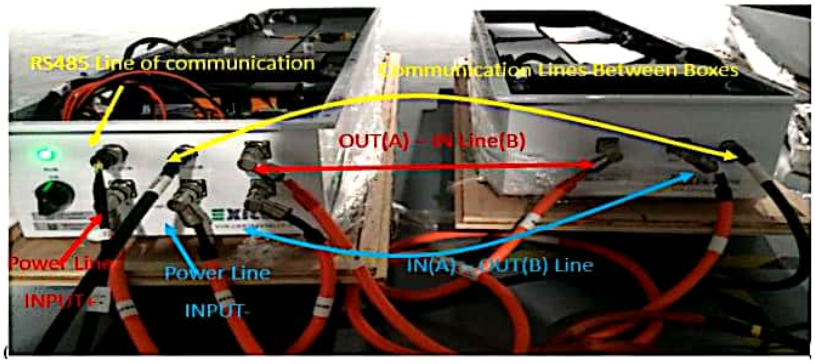


Fig no.7.4.3 (a): Battery Pack interconnection

Sr No.	Name	Cable Mark	Box Mark
1.	OUT(A-)- IN(B+)line	Power cable marked as "OUT(A-)"	PACK A "OUT"
		power cable marked as "IN(B+)"	PACK B "IN"
2.	IN(A +)- OUT(B-)line	Power cable marked as "IN(A +)"	PACK A "IN"
		power cable marked as "OUT(B-)"	PACK B "OUT"
3.	6PIN Communication line	6PIN communication cable marked in yellow in below picture2-1	Pack A "IN COM"
			Pack B "IN COM"

7.4.4 Accessories for Battery Pack Interconnection

1. "OUT(Pack A-) - IN(Pack B+) Wire" (Refer Fig no 7.5.4 (a)).
2. "IN(Pack A+) - OUT(Pack B-)Wire" (Refer Fig no 7.5.4 (b)).
3. "Pack Communication Wire(black)" (Refer Fig no 7.5.4 (c)).

Fig No. 7.4.4(a)

Fig No. 7.4.4(b)

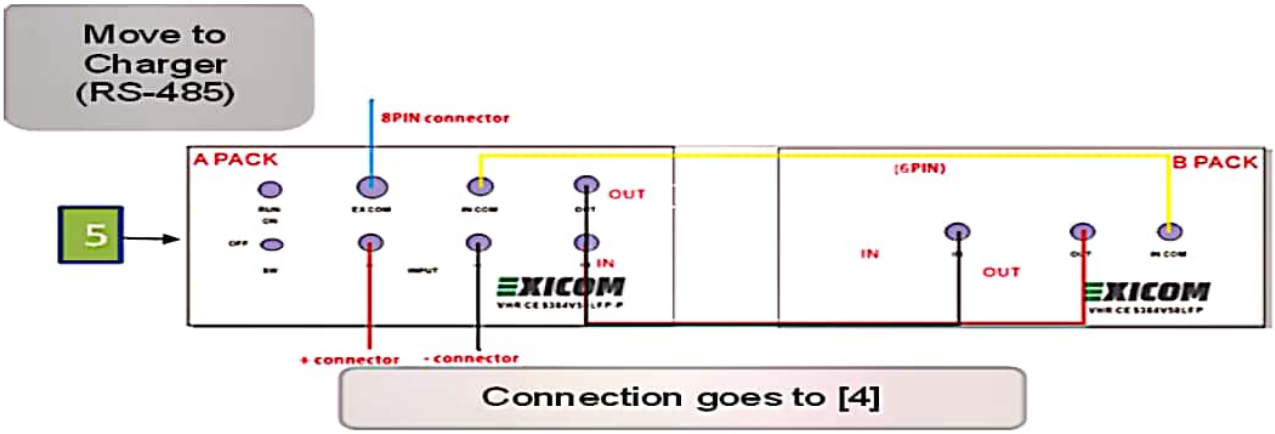
Fig No. 7.4.4(c)

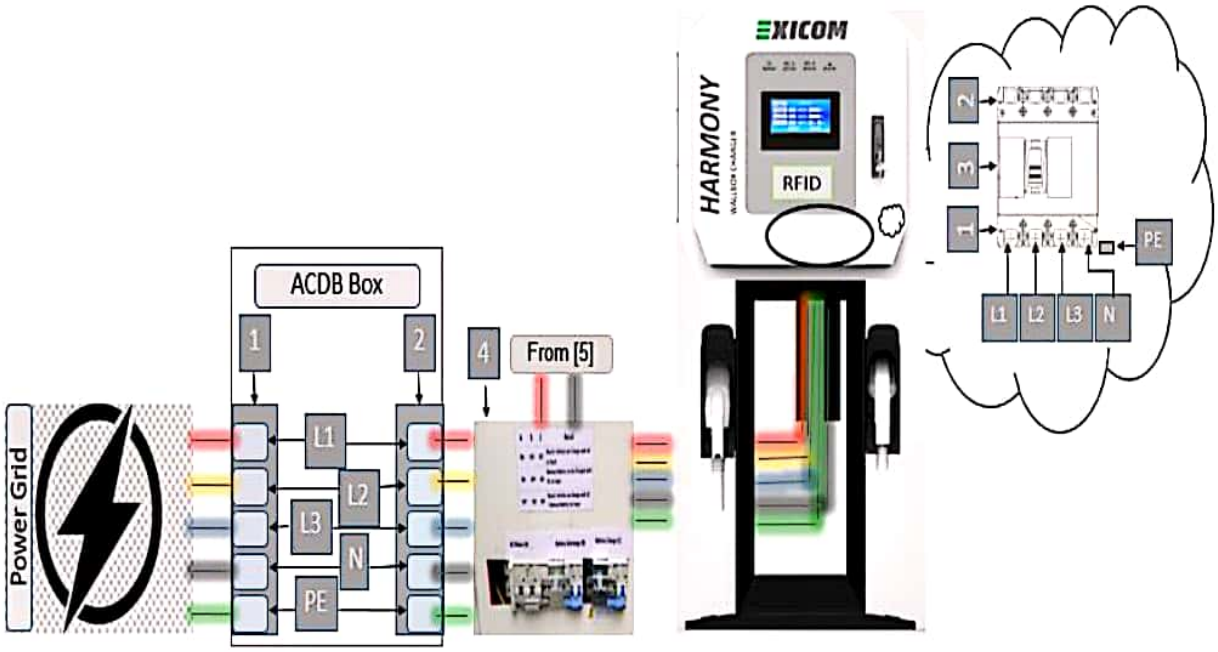
7.4.5 Accessories for Battery Pack and Charger Interconnection

1. **"INPUT+ Connector"**: 16mm2 connection wire is suggested to be used for connection. Bellows and flame retardant wire should be used. The bellows and connectors are connected by a double-wall thermoplastic tube with thermal shrinkage.
2. **"INPUT-Connector":** . 16mm2 connection wire is suggested to be used for connection. Bellows and flame retardant wire should be used. The bellows and connectors are connected by a double-wall thermoplastic tube with thermal shrinkage.
3. **"8PIN communication connector (black)"** : 5mm2 connection wire is suggested to be used for connection. Pack pin G to 485A, pin H to 485B. Another 6PINS reserved.(Use plug for reserved PINs if no wire connection, plug Model:AT13-204-2005)

7.5 EV Charger Connection

The charger works on three phase 5 wires system. So, as per charger rating the input cable with distribution box is to be installed (refer Annexure-I for ratings). Below given is the block diagram view for the same,





[1]	AC Input	[2]	AC Output
[L1]	Mains Connection Phase Conductor 1	[L2]	Mains Connection Phase Conductor 2
[L3]	Mains Connection Phase Conductor 3	[N]	Mains Connection Neutral Conductor
[PE]	Mains Connection Earthing Conductor	[3]	MCCB (4P)
[4]	Junction Box	[5]	Battery Backup

Junction Box Connection

S. No.	[13]	[15]	[16]	Result
1	ON	OFF	OFF	EV can Charge via AC Mains
2	ON	OFF	ON	Backup battery Charge
3	OFF	ON	OFF	EV can charge via backup battery

NOTE:
**Please don't try any other combination other than above mentioned. It may lead to hazardous accidents.*
**Use mechanical interlocking between the MCBs and do not remove this as it may lead to hazardous accidents.*

SECTION 8 COMMISIONING INSTRUCTIONS

EV Charger Commissioning Service is a key part of an overall deployment of the EV Charging Station. This service provides the certified Exicom field service Engineers needed to activate and check the functionality of the system.
Exicom will send a technician to verify proper connection and functionality of the charging station following installation by the contractor.

Physical verification,

- Installations cable ratings as per **Annexure-I.**
- Ensure all the input wiring connections tight & secure.
- Visually inspect all cables for proper crimping of terminals.
- Make sure cable insulation is not damaged.
- Ensure proper Earthing.

Post physical verification,

- Switch ON MCCB from DB box and Ensure input voltage & neutral to earth voltage are within specified range of the charger. Measure voltage at input terminal of the charger.
- Switch ON all MCCB/RCD inside the charger.
- Update latest software of upper controller and pilot controller.
- Insert all rectifier/SMR modules in system and ensure that all modules are communicating with controller. Refer **Annexure-II** for details.
- Ensure no alarm is present in the charger.
- Make charger online with the OCPP server, if required by customer.
- Charging on all connectors are to be done with relevant vehicle.

SECTION 9 QUICK/BASIC SETTING NAVIGATION

The charger is designed to show each related system information to user for easy accessibility and on site user based solutions. Setting are protected under the second level password. Please consult with Exicom's customer support team to get the password. Few of quick/basic setting are explained below,

- Check active alarms,
  Home >  > Active Alarm
- Check history logs,
  Home >  > Change Records
- Check software version upper controller,
  Home >  > About
- Check software version of pilot controller,
  Home >  > Password > Param set > CCU Specific Setting > CCU Firmware version
- Set Date and time,
  Home >  > Password > Param set > Charger system > System DateTime
- Set Charger ID,
  Home >  > Password > Param set > Charger system > Charger ID
- Set gun A current limit ,
  Home >  > Password > Param set > CCU Specific Setting > GUN-A Current limit
- Set gun B current limit ,
  Home >  > Password > Param set > CCU Specific Setting > GUN-B Current limit
- Set PLC board type ,
  Home >  > Password > Param set > CCU Specific Setting > PLC Board type
- Set Charge point Model ,
  Home >  > Password > Param set > Charge point boot info > Charge point Model
- Set Charge point Serial number ,
  Home >  > Password > Param set > Charge point boot info > Charge point SN
- Set OCPP URL address ,
  Home >  > Password > Param set > Charger System > OCPP Server END URL

- Configure Energy meter for GUN-A ,

  Home >  > Password > Param set > kWh Meter A > kWh Meter Type

  Home >  > Password > Param set > kWh Meter A > kWh Meter SN

  Home >  > Password > Param set > kWh Meter A > Baud rate setting

- Configure Energy meter for GUN-B ,

  Home >  > Password > Param set > kWh Meter B > kWh Meter Type

  Home >  > Password > Param set > kWh Meter B > kWh Meter SN

  Home >  > Password > Param set > kWh Meter B > Baud rate setting

- Checking Charger configuration

  Home >  > Detailed Info > Charger System > Current Work Mode

SECTION 10 CHARGEING FLOW

10.1 Introduction

The Portable DC Charger is specially designed for stand column installation applications for CCS type 2 and CHAdeMO standard EV car fast charging User-friendly interface, easy operation. IP54 protection, sturdy and durable for outdoor applications. Compatible with 500V and 750V, easy to configure for output power up to 40KW.
The charging system is composed of the DC charging cabinet and DC charging Gun. The System can be installed outdoors (But for safety reasons, it should not be used during rain or snow if water can reach the charger DC connector).

Portable Charger consists of the following:

1) Exicom's Harmony 40kW DC Charger
2) 19.2kW Backup Battery Modules
3) Junction Box

10.2 Authentication Methods

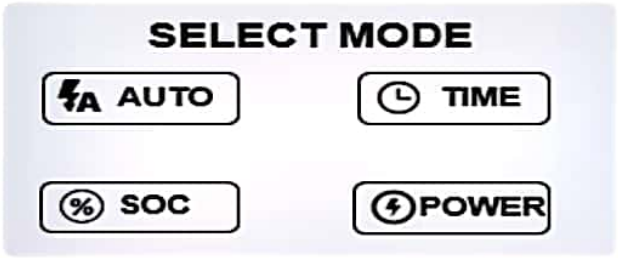
The charger supports various options/methods of user authorization. All these options are as below,

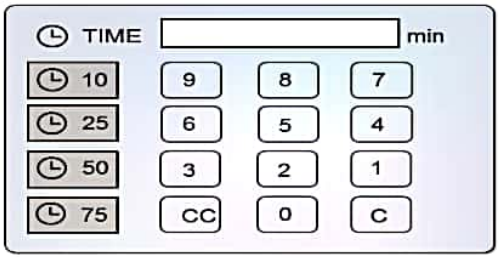
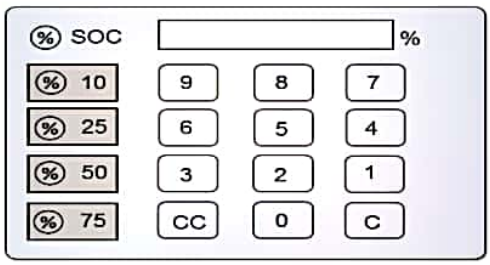
	Click and scan RFID card on charger at RFID symbol as below, 
OTP	Click and enter received OTP on mobile app.

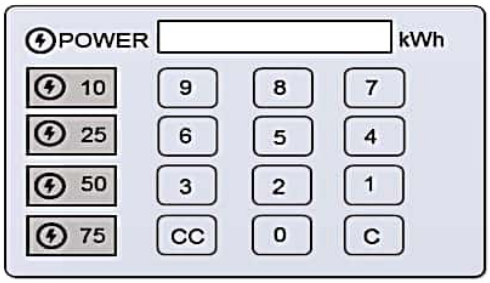
	Scan QR code with mobile App.

10.3 Charging Modes

The charger support various options/methods for charging modes. All these options are as below,



Mode	Description	Reference
AUTO	This mode fully (100%) charge vehicle unless the charging stopped by fault/vehicle.	
TIME	This mode allows to charge vehicle for a specific duration of time. > Enter value and start charging.	
SOC	This mode allows to charge vehicle to a defined SOC. > Enter value and start charging.	

POWER	This mode allows to charge vehicle to a defined energy consumption/kWh. > Enter value and start charging.	

10.4 Junction Box Working

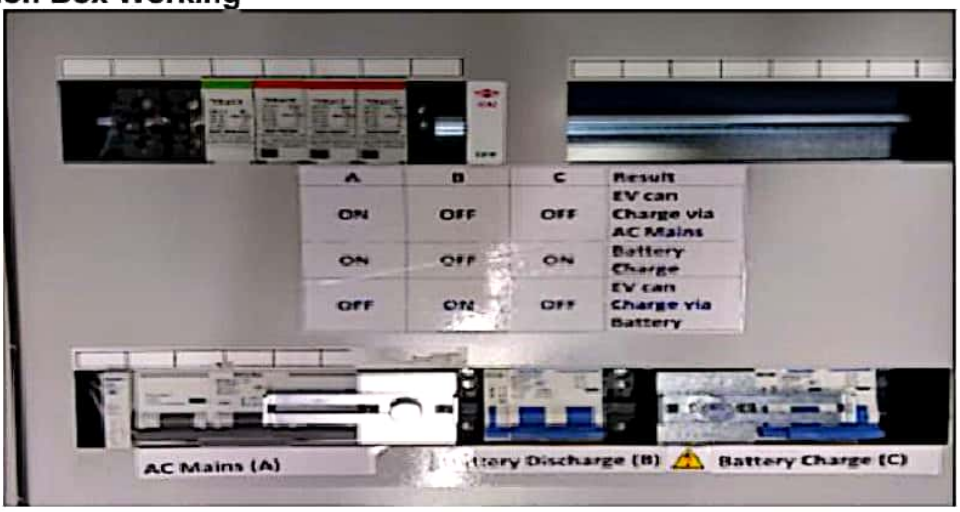


Fig 10.4 (a): Junction Box

This Junction Box can be used for 3 Purposes as listed below,

4) **When AC Mains is available and Battery packs are at low SoC**: Here, as per the below table attached, go as per Serial No. 2. Battery packs will be charged from Charger with AC as input.
5) **When EV Assurance Vehicle is at the field and needs to charge an EV with low SoC**: Here, as per the below table attached, go as per Serial No. 3. Charger will charge the EV with DC as input.
6) **When EV Assurance Vehicle is at Station and EV with low SoC is present there**: Here, as per the below table attached, go as per Serial No. 1. Charger will charge the EV with AC as Input.

S. No.	A	B	C	Result
1	ON	OFF	OFF	EV can Charge via AC Mains
2	ON	OFF	ON	Backup battery Charge
3	OFF	ON	OFF	EV can charge via backup battery

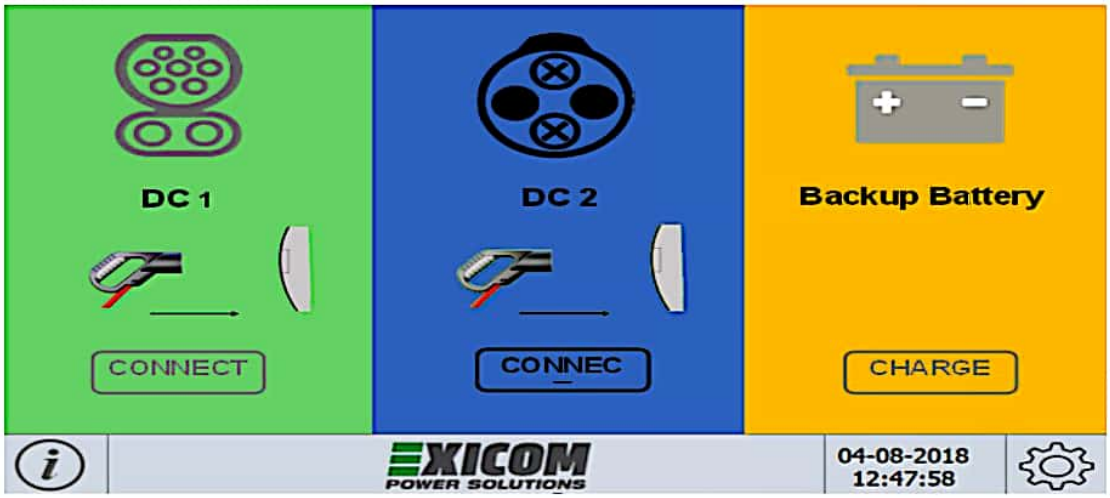
Table 10.4(b): Junction Box Table

**Please don't try any other combination other than the above mentioned. It may lead to hazardous accidents.*

**Use mechanical interlocking between the MCBs and do not remove this as it may lead to hazardous accidents.*

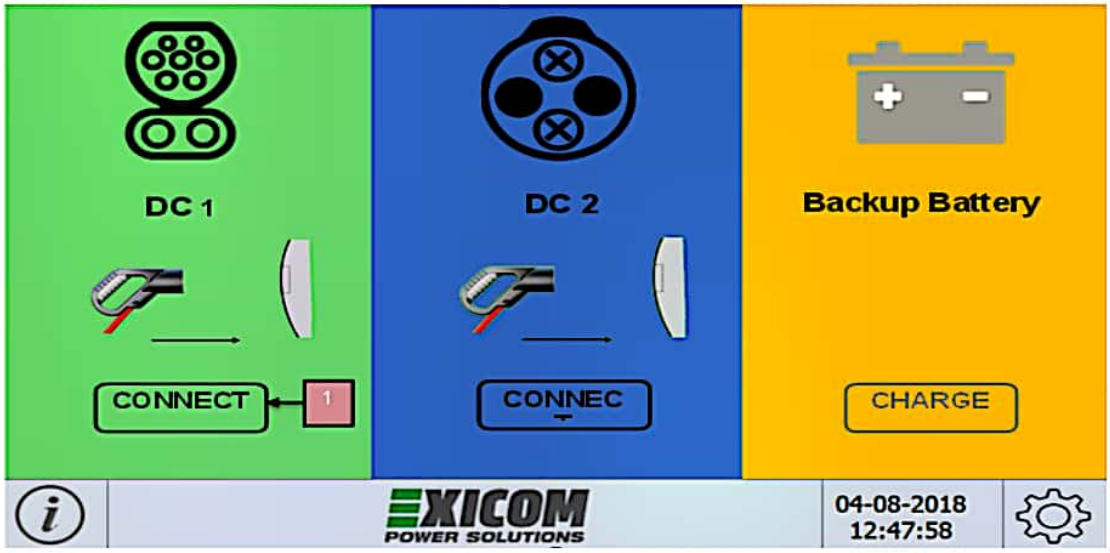
10.5 Charging Procedure

10.5.1 Flow of How to Charge using Gun-1 (AC Input)



Default Home Page for Portable Charger (CCS+CHAdeMO)

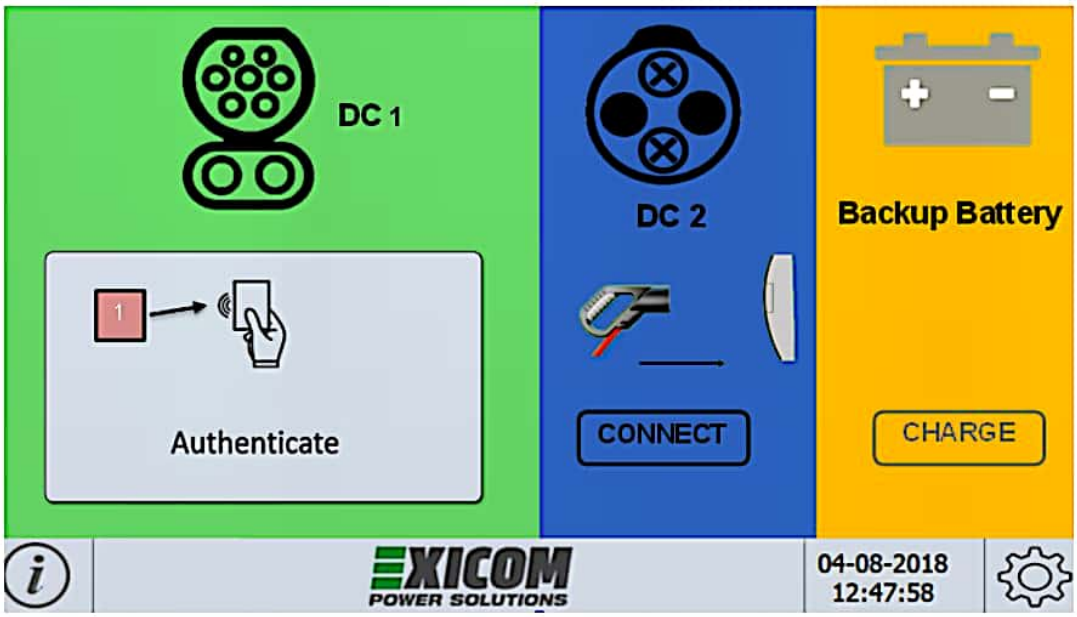
Step-1: Insert Gun-1 into the vehicle. As soon as Gun is properly plugged in, Charger will sense it and Connect Button of DC-1 will become Active.



CCS Gun Plugged In

[1]	Connect becomes active and can be pressed now. Press "CONNECT" move ahead.

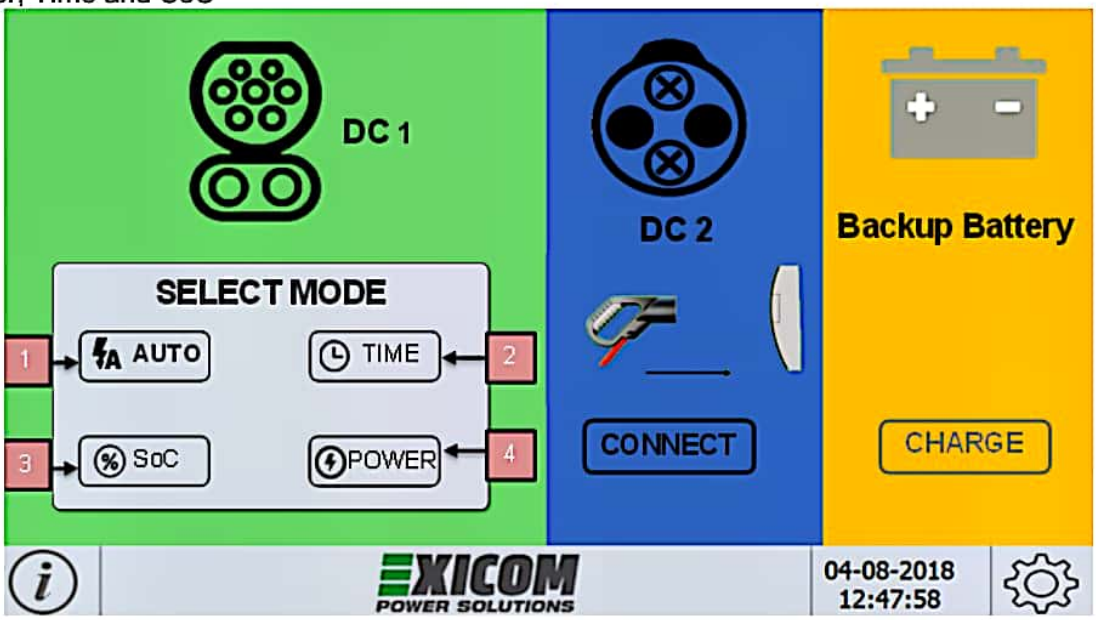
Step-2: After the Connect button is Clicked, Charger asks for Authentication. Below attached picture represents the Charger screen requesting for Authentication.



Authorization

[1]	RID Option	Click on RFID Symbol and scan RFID Card over RFID Card Reader.

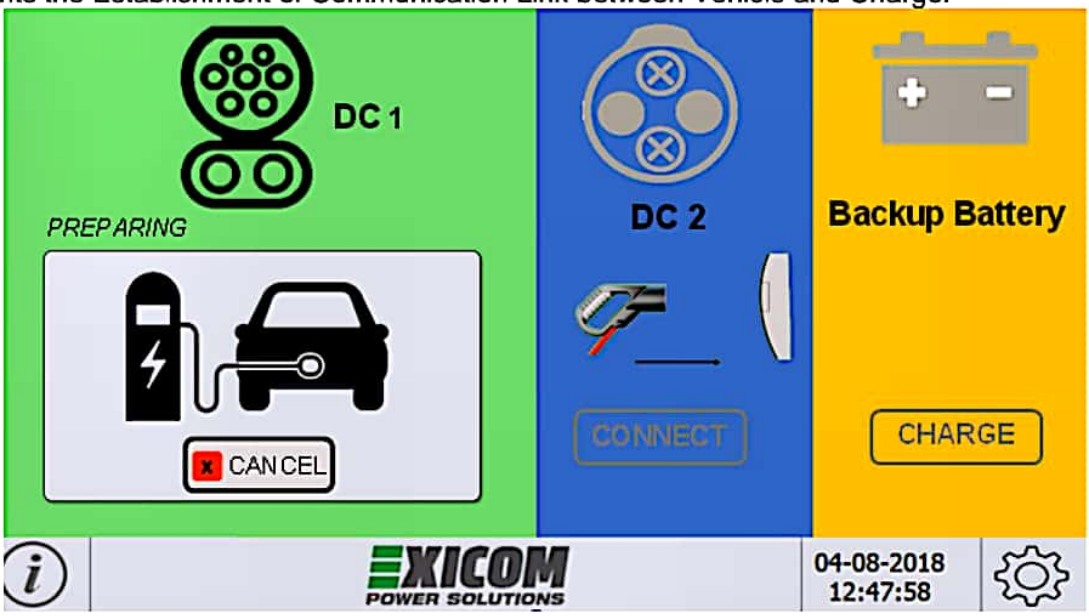
Step-3: The Charger next asks for the mode of Charging. Harmony charger supports 4 modes namely, Auto, Power, Time and SoC



Mode Selection

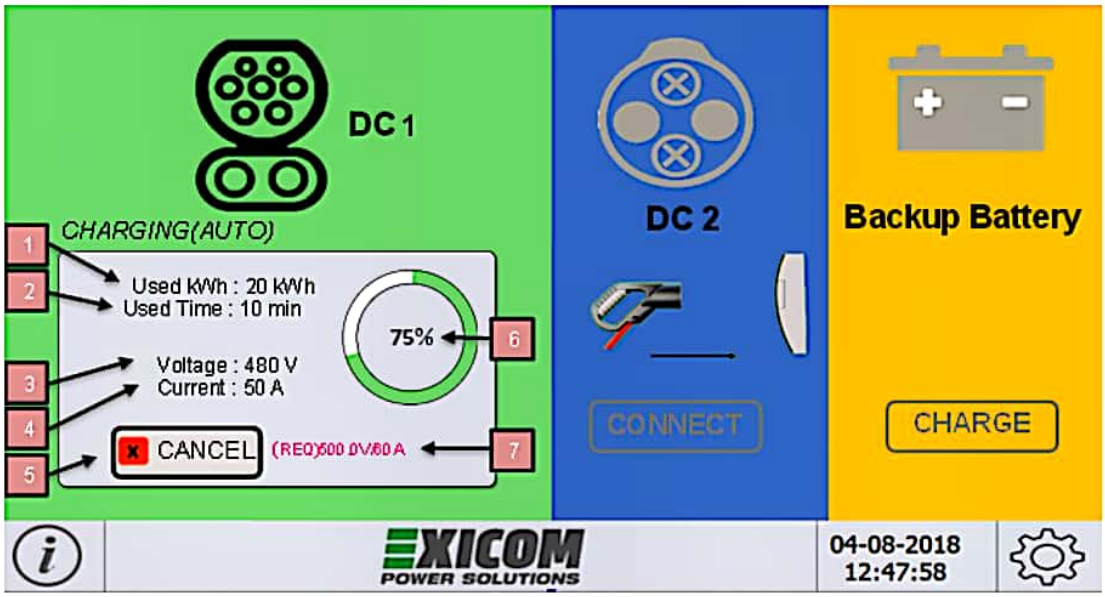
Step-4: After choosing the respective Charging mode, Charger then goes to preparing state which

represents the Establishment of Communication Link between Vehicle and Charger



Gun Preparing State

Step-5: After successful communication, Charging starts. Refer below the attached picture, displaying the Charging screen.

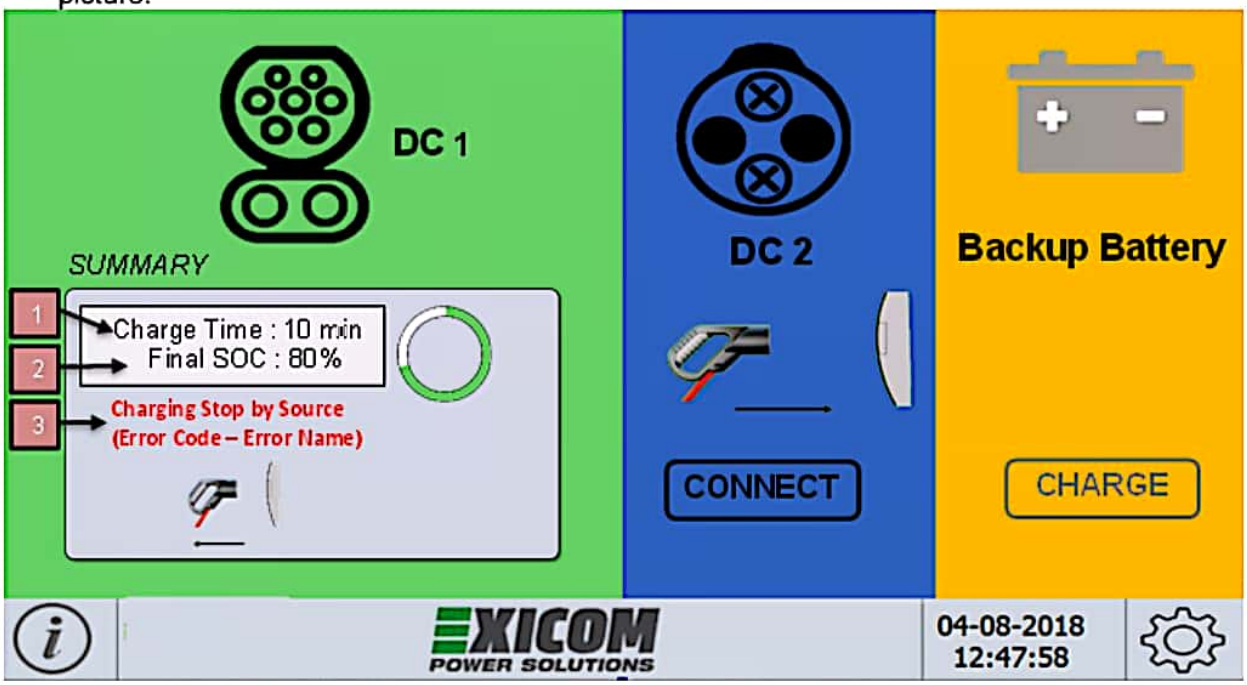


Charging screen

S.No.	Parameter	Description
[1]	Used kWh	Displays Total Energy transferred to vehicle
[2]	Used Time	Displays the duration of the charging process until the present time.
[3]	Voltage	Displays present Output Voltage.
[4]	Current	Displays present Output Current
[5]	Cancel Button	Press here, to stop Charging.
[6]	SoC Level	Displays present SoC level of Vehicle.
[7]	REQ	Displays request from Vehicle i.e. Voltage and Current Demand.

Step-6:

1) If the user presses the "CANCEL" button, Charger again asks for authentication if it started with RFID. Swipe the same RFID card to stop charging and the Summary page will same as for Point 2.
2) If Charging stops automatically, the Summary page is shown on display. Refer to the attached picture.

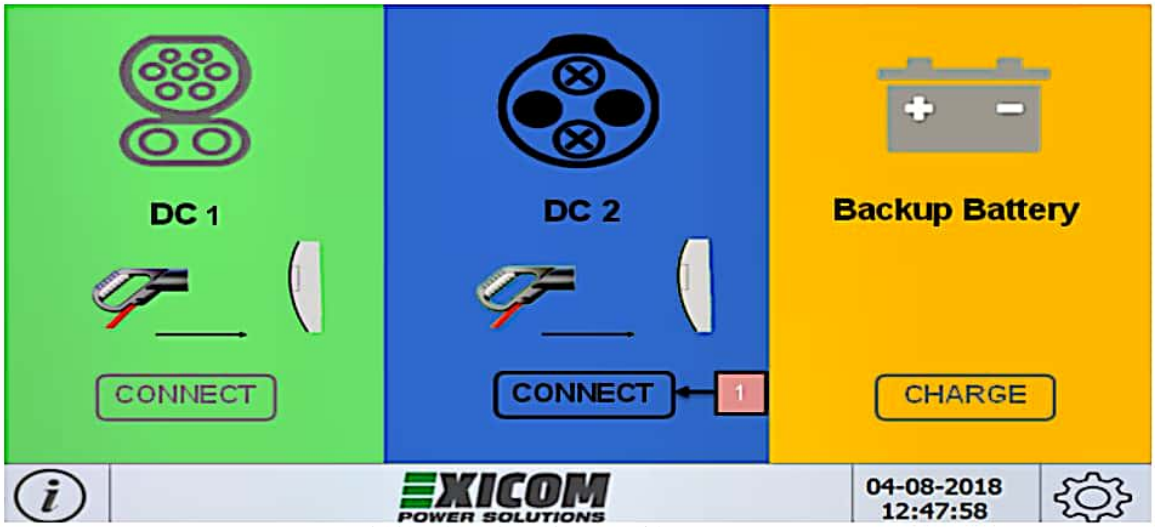


CCS Gun Summary Page

Step-7: After a complete charging cycle, remove the Gun from the vehicle and Summary Page will change to initial Default Home Page.

10.5.2 Flow of How to Charge using Gun-2 (AC Input)

Step-1: Insert Gun-2 into the vehicle. Click on the "CONNECT" button.



CHAdeMO Gun Plugged In

[1]	Connect becomes active and can be pressed now. Press "CONNECT" move ahead.

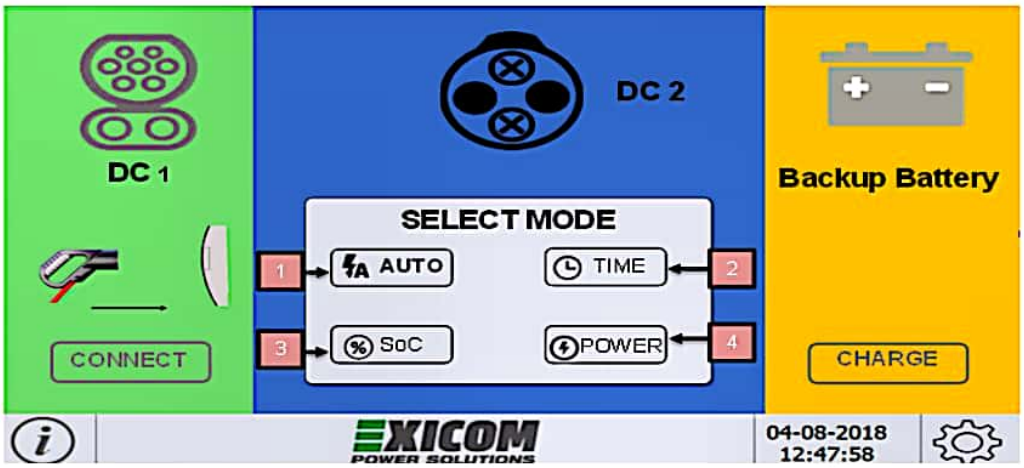
Step-2: After the Connect button is Clicked, Charger asks for Authentication. Below attached picture represents the Charger screen requesting for Authentication.

CHAdeMO Gun Authentication

[1]	RFID Option	Click on RFID Symbol and scan RFID Card over RFID Card Reader.
[2]	OTP Option	Click on OTP Symbol. Enter OTP. Click Ok to proceed.
[3]	QR Code Option	Scan QR Code with Mobile App and Start Charging from Mobile App.

***Note** – Look for the below-attached RFID Symbol on Charger's Front Door. It is located below the screen only. The RFID card needs to be swiped over it.*

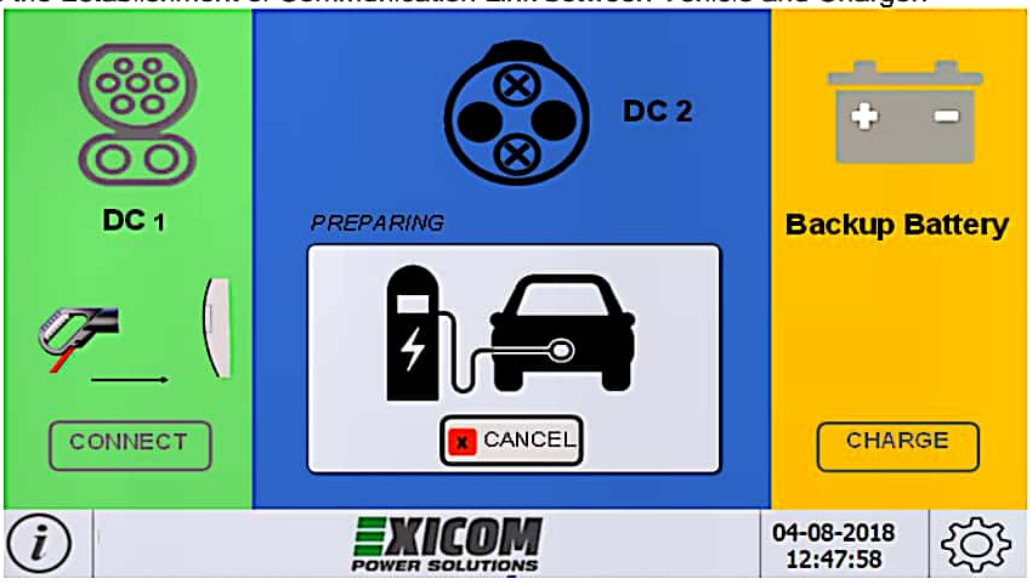
Step-3: The Charger next asks for the mode of Charging. Harmony charger supports 4 modes namely, Auto, Power, Time and SoC. Each of them is described below:



CHAdeMO Gun charging mode selection

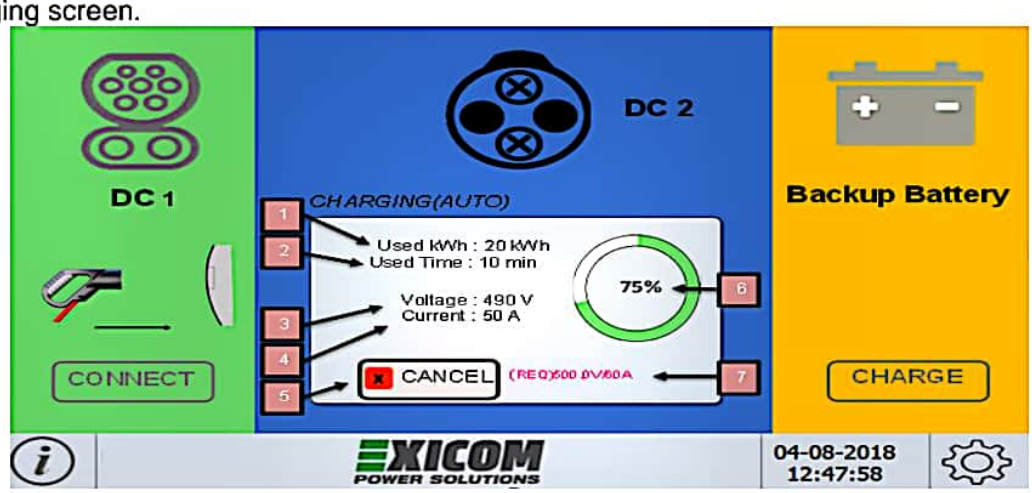
S.No.	Mode	Description
[1]	Auto	Auto Mode fully charges the vehicle.
[2]	Time	Time Mode enables Users to charge vehicles on Time basis.
[3]	SoC	SoC Mode enables Users to charge vehicle to a defined SoC level.
[4]	Power	Power Mode enables Users to charge vehicles as per defined Power Limit.

Step-4: After choosing the respective Charging mode, Charger then goes to preparing state which represents the Establishment of Communication Link between Vehicle and Charger.



CHAdeMO Gun Preparing state

Step-5: After successful communication, Charging starts. Refer below the attached picture, displaying the Charging screen.

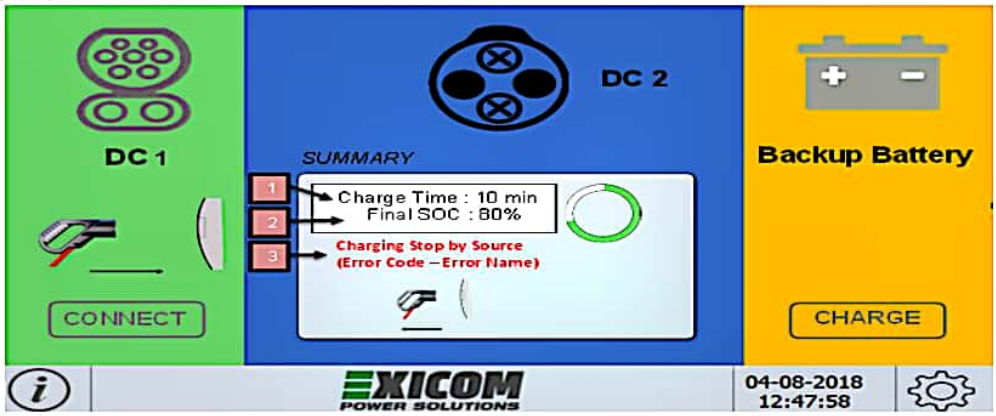


CHAdeMO Gun Charging Stage

S.No.	Parameter	Description
[1]	Used kWh	Displays Total Energy transferred to vehicle
[2]	Used Time	Displays the duration of the charging process until the present time.
[3]	Voltage	Displays present Output Voltage.
[4]	Current	Displays present Output Current
[5]	Cancel Button	Press here, to stop Charging.
[6]	SoC Level	Displays present SoC level of Vehicle.
[7]	REQ	Displays request from Vehicle i.e. Voltage and Current Demand.

Step-6:

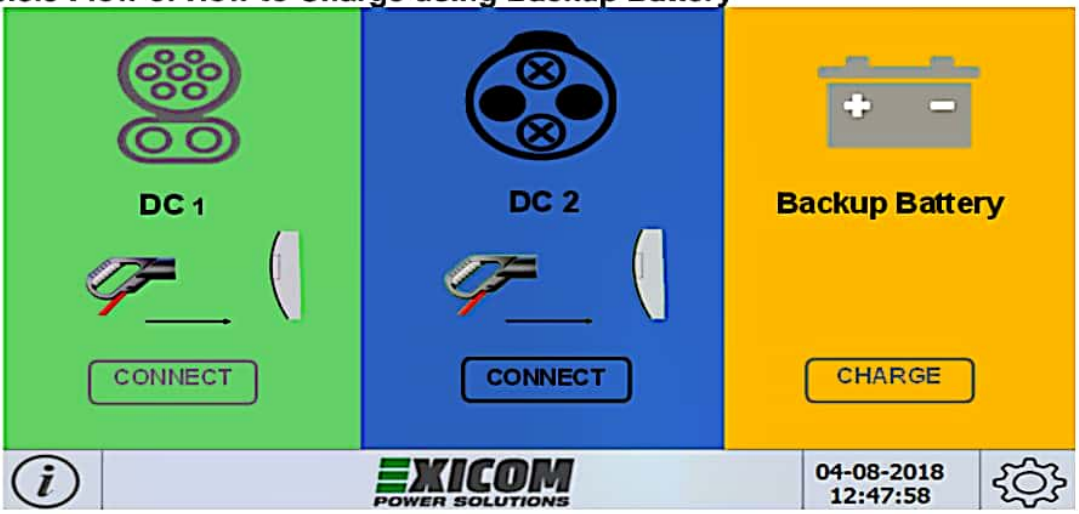
1) If the user presses the "CANCEL" button, Charger again asks for authentication if it started with RFID. Swipe the same RFID card to stop charging.
2) If Charging stops automatically, the Summary page is shown on display. Refer to the attached picture.



CHAdeMO Gun Summary Page

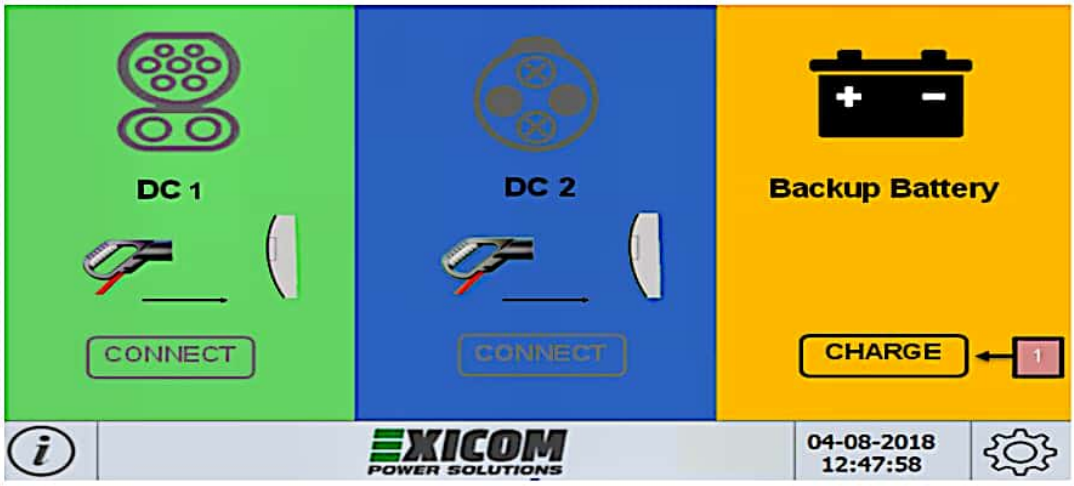
S.No.	Parameter	Description	
[1]	Charge Time	Displays Time duration of a Charging cycle.	
[2]	Final SoC	Displays Final SoC of Vehicle	
[3]	Charging Stop by	Charger	Displays in fault/full SoC scenario, charging was stopped from Charger end. Error Code and Error Name gives specific details for fault occurrence. Refer Annexure-I (4.1) for details of Error Code.
		Vehicle	Displays in fault/SoC scenario, charging was stopped from Vehicle end. Error Code and Error Name gives specific details for fault occurrence. Refer Annexure-I (4.2) for details of Error Code.

10.5.3 Flow of How to Charge using Backup Battery



Default Home Page for Portable Charger (CCS+CHAdeMO)

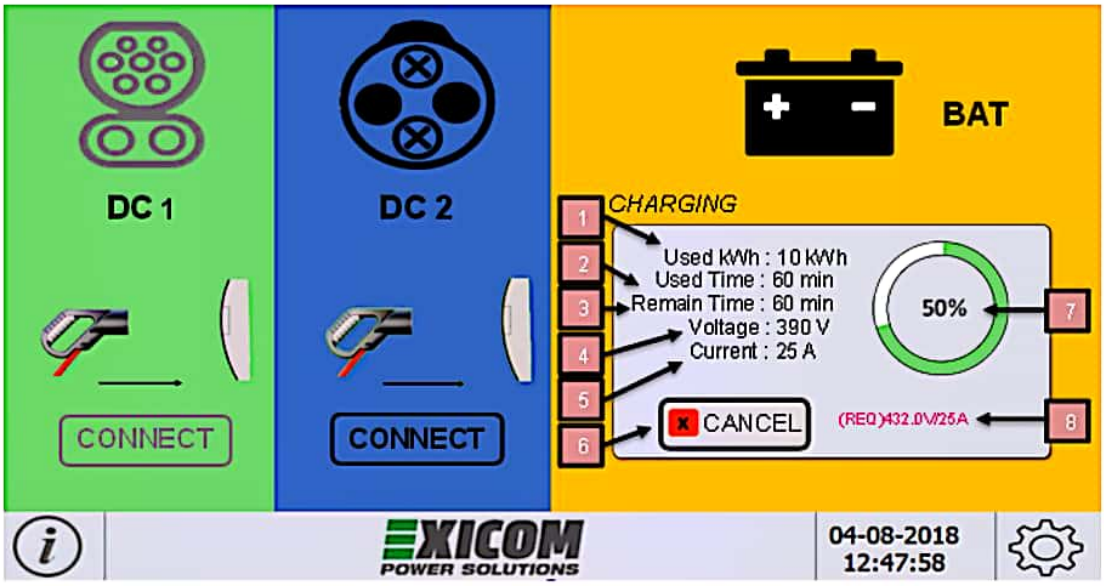
Step-1: After switching as per proper instruction, CHARGE Button will become active



Ready to Charge Backup Battery

[1]	Connect becomes active and can be pressed now. Press "CHARGE" to move ahead.

Step-2: After clicking the CHARGE button, the charger will start charging Battery. Refer to the attached picture.

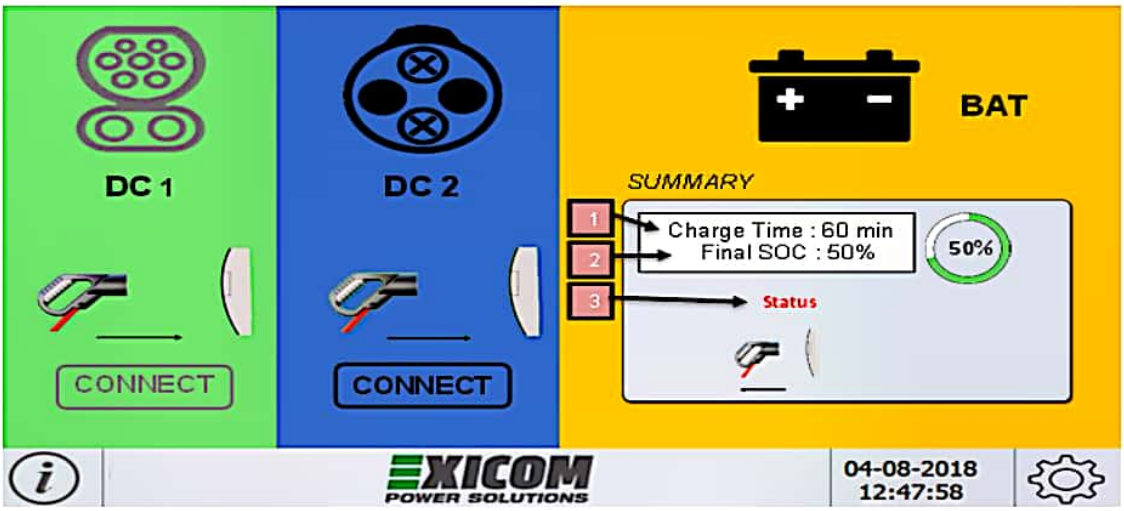


Backup Battery Charging

S.No.	Parameter	Description
[1]	Used kWh	Displays Total Energy transferred to vehicle
[2]	Used Time	Displays the duration of the charging process until the present time.
[3]	Remain Time	Displays remaining time to full Charge.
[4]	Voltage	Displays present Output Voltage.
[5]	Current	Displays present Output Current
[6]	Cancel Button	Press here, to stop Charging.
[7]	SoC	Displays present SoC of Battery
[8]	REQ	Displays Battery Voltage Demand and Current Demand.

Step-3:

1) If the user presses the "CANCEL" button, Charger again asks for authentication if it started with RFID. The summary page will same as for Point 2.
2) If Charging stops automatically, the Summary page is shown on display. Refer to the attached picture.



Backup Battery Summary Page

S.No.	Parameter	Description
[1]	Charge Time	Displays Time duration of a Charging cycle.
[2]	Final SoC	Displays Final SoC of Backup Battery
[3]	Status	Displays the Status due to which Charging was stopped. Refer to Annexure-I (4.4) for details.

SECTION 11 TROUBLESHOOTING INTRUCTIONS

During charging vehicle requests for voltage & current and charger delivers the same by limiting the current as per requested current. However, charging may be stopped/interrupted by varies reasons. Charging can be stopped by-charger, vehicle or by any other means. Charger generates stop reason based on the nature of charging stops. Below explained are the stop reasons and explanations on how to resolve the stop reason issues,

11.1 Stop Reason Troubleshooting

11.1.1 Charging Stopped/Interrupted by charger

S. No	Alarm Name	Alarm Code	Alarm Cause	Alarm Resolution
1	Parameter configuration failed	201	Alarm is reported by Charger	1. Retry Charging. 2. If generated frequently take PLC serial and CAN log of the respective gun and share for analysis.
2	Charging enable timeout	202	Alarm is reported by Charger	1. Retry Charging. 2. If generated frequently, please inform the vehicle manufacturer regarding this. 3. Still an issue, take PLC serial and CAN logs of the respective gun and share for analysis.
3	Abnormal volt of outside bus	203	Alarm is reported by Charger	1. Check wires of 10-J30 connectors for respective gun. 2. Check if rectifiers are building the voltage. 3. Check if DC contactors of respective guns are working OK. 4. Do a calibration from settings. 5. Take PLC serial and CAN logs of the respective gun and share for analysis.
4	Unable lock charging gun	204	Alarm is reported by Charger	1. Check the 12VDC output of Aux. power supply. 2. Check if the pilot controller is sending a 12VDC signal to GUN. 3. Check if lock feedback sense wiring is OK.
5	Insulation inspection abnormally	205	Alarm is reported by Charger	1. Check if rectifiers are building the voltage. 2. Measure voltage at output. 3. Check voltage on the insulation board. 4. Change vehicle and test again. 5. Take PLC serial and CAN logs of the respective guns and share for analysis.
6	Insulation inspect timeout	206	Alarm is reported by Charger	1. Check if rectifiers are building the voltage. 2. Change vehicle and test again. 3. Take PLC serial and CAN logs of the respective gun and share for analysis.

7	EV Relay pull-in timeout	207	Alarm is reported by Charger	1. Check battery voltage after contractors (Vehicle end). If no voltage, please inform the vehicle manufacturer. 2. Change vehicle and test again. 3. Take CAN logs of a respective gun and share it for analysis.
8	Require Curr Timeout	208	Alarm is reported by Charger	1. Change vehicle and test again. 2. Take CAN logs of the respective gun and share for analysis.
9	Remain time over stop	209	Alarm is reported by Charger	1. This is a normal stop, no panic. 2. If vehicle SOC is not 100%, take CAN logs of the respective gun and share for analysis.
10	Ring fail alarm	210	Alarm is reported by Charger	This is a reserved alarm. Shall not display on the charger, if observed on-screen please coordinate with the R&D team.
11	Comm with EV failed	211	Alarm is reported by Charger	1. Restart the vehicle and try again the charging. 2. Change vehicle and try again charging. 3. For CCS, CHAdeMO or GBT, take PLC serial and CAN log of the respective gun and share for analysis. 4. For AC Charging Gun, check the PWM voltage stage by the multimeter.
12	Plugged gun timeout	212	Alarm is reported by Charger	1. Check if the gun is properly connected to the vehicle. 2. Restart the vehicle and try again the charging. 3. Check 12V between CP & PE on PLC board when gun not connected, 9V when the gun is connected and 6V when charging. 4. Change vehicle and try again charging. 5. Take PLC serial and CAN logs of the respective gun and share for analysis. 6. For AC Charging Gun, check the PWM voltage stage by the multimeter.
13	Pre Charging Fault	213	Alarm is reported by Charger	1. Check if rectifiers are building the voltage. 2. Measure voltage at output. 3. Check if the contactors are closing. 4. Change vehicle and test again. 4. Change vehicle and test again.
14	Door Open	214	Alarm is reported by Charger	Close door/check wiring at the door sensor.
15	Emergency button pressed	215	Alarm is reported by Charger	Release Emergency button / check wiring at button.

16	SPD Fail	216	Alarm is reported by C	Change SPD if faulty (check the red color on SPD) / check wiring of SPD.
17	All Rectifier fail	217	Alarm is reported by Charger	1. Check SMR CAN wiring. 2. Check if all SMR are inserted properly. 3. Check if input MCCB is ON & input voltage is healthy. 4. Open the cover and check SMR red LED, if RED led is ON, remove one SMR and check individually.
18	Mains Fail	218	Alarm is reported by Charger	1. Check SMR CAN wiring and check if all SMR are inserted properly. 2. Check if input MCCB is ON & input voltage is healthy.
19	AllRecr CommFail	219	Alarm is reported by Charger	1. Check SMR CAN wiring. 2. Check if all SMR are inserted properly. 3. Check if input MCCB is ON & input voltage is healthy.
20	E-Lock Failed	220	Alarm is reported by Charger	1. This is only for the GBT connector. 2. Please check the connector e-lock configuration in display. 3. Check 12V pulse for LKA+ & LKA-. 4. Check gun lock feedback wires.
21	Gun over temperature	221	Alarm is reported by Charger	1. Change vehicle and try again. 2. Observe temperature with an external device.
22	Output short circuit	222	Alarm is reported by Charger	1. It is reported from the power module. 2. Take a pilot controller to SMR CAN data on CAN port3. The baud rate is 125Kbps.
23	PWM Failure	223	Alarm is reported by Charger	AC connector PWM connection failure. Please check the AC connector cable.
24	Ground Fault Detected	224	Alarm is reported by Charger	The earth is not properly connected. Please check the system wiring.
25	CR Comm Fail	250	Alarm is reported by Charger	1. Please check if RFID is ON/OFF. 2. Please check if RFID cable is connected.
26	kWhMeter Comm Fail	251	Alarm is reported by Charger	1. Check if DC & AC energy meters are ON or OFF. 2. Please check the wiring of meters.
27	CCU Comm	252	Alarm is	1. Check if the pilot controller is ON or OFF.

	Fail		reported by Charger	2. Please check the RS485 wiring of the pilot controller with an upper controller.
28	Charging enable timeout	202	Alarm is reported by Charger	1. Retry Charging. 2. If generated frequently, please inform the vehicle manufacturer regarding this. 3. Still an issue, take PLC serial and CAN logs of the respective gun and share for analysis.

11.1.2 Charging stopped/Interrupted by Vehicle

S. No	Alarm Name	Alarm Code	Alarm Cause	Alarm Resolution
1	EV Request Stop	2	Alarm is reported by Vehicle	1. Please change the vehicle and try again charging. 2. Inform the user to check at the vehicle end. 3. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
2	Battery overvoltage	301	Alarm is reported by Vehicle	1. Please check the power module output voltage to make sure it matches the EV required voltage. 2. Please change the vehicle and try again charging. 3. Inform the user to check at the vehicle end. 4. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
3	Battery under voltage	302	Alarm is reported by Vehicle	1. Please check the power module output voltage to make sure it matches the EV required voltage. 2. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
4	Battery current deviation error	303	Alarm is reported by Vehicle	1. Please check the power module output current to make sure it matches the EV required current. 2. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
5	High battery temperature	304	Alarm is reported by Vehicle	1. Please change the vehicle and try again charging. 2. Inform the user to check at the vehicle end. 3. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
6	Battery voltage deviation error	305	Alarm is reported by Vehicle	1. Please change the vehicle and try again charging. 2. Inform the user to check at the vehicle end. 3. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.

7	Charger Connector Lock Fault	306	Alarm is reported by Vehicle	1. Please check the connector, inlet, or plug out and in again. 2. Please change the vehicle and try again charging. 3. Inform the user to check at the vehicle end. 4. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
8	Vehicle shift position	307	Alarm is reported by Vehicle	1. Please change the vehicle and try again charging. 2. Inform the user to check at the vehicle end. 3. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
9	Error Status Noticed by EV	308	Alarm is reported by Vehicle	1. Please check the rectifier present current voltage. 2. Please change the vehicle and try again charging. 3. Inform the user to check at the vehicle end. 4. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
10	PLC Low-Level Comm Fail	309	Alarm is reported by Vehicle	1. Unable to set up communication. 2. Please change the vehicle and try again charging. 3. Inform the user to check at the vehicle end. 4. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
11	PLC High-Level Comm Fail	310	Alarm is reported by Vehicle	1. At HLC stages, communication fails. 2. Please change the vehicle and try again charging. 3. Inform the user to check at the vehicle end. 4. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
12	PLC Authentication Timeout	311	Alarm is reported by Vehicle	1. At Authentication stages, communication fails. 2. Please change the vehicle and try again charging. 3. Inform the user to check at the vehicle end. 4. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.
13	PLC ParamDiscovery Timeout	312	Alarm is reported by Vehicle	1. At ParamDiscovery stages, communication fails. 2. Please change the vehicle and try again charging. 3. Inform the user to check at the vehicle end. 4. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.

11.1.3 Charging stopped/ interrupted – Other reasons

S. No	Alarm Name	Alarm Code	Alarm Cause	Alarm Resolution
1	Local Stop	401	Alarm is cause by User	User Canceled the charging from display.
2	Server Stop	402	Alarm is cause by User	Charging stopped from the OCPP server via the "Remote stop" command. Please check with the OCPP server engineer.
3	Reboot	404	Alarm is cause by User	Charging stopped from the OCPP server because the OCPP server engineer has sent a charger reboot command. Please check with the OCPP server engineer.
4	DeAuthorized	405	Alarm is cause by User	Charging stopped because the "Start transaction" response is Invalid sent by the OCPP server. Please check with the OCPP server engineer.
5	Other	501	Alarm is cause by User	1. Please change the vehicle and try again charging. 2. Please take serial data & CAN1/CAN2 data of PLC module. Also capture SMR data from controller's CAN3 Port.

11.1.4 Stop Status of Backup Battery

S. No	Status Name	Description
1	Fully Charged	Backup Battery is fully charged.
2	Fully Discharged	Backup Battery is fully discharged
3	Fault	Fault in Battery Backup.
4	Battery Communication Fail	Backup Battery Communication Fail with Charger.

11.2 Alarms Troubleshooting

The chargers are equipped with multiple devices such as rectifier's module, MCBs, energy meters & controllers, etc. These devices communicate with the main controller board. This master control board controls the charger and if anything unusual happens the charger generates the alarm. All types of alarms and their explanation is explained below,

11.2.1 System-Level Alarms

i. These are system-level alarms,

S. No	Alarm Name	Alarm Cause	Alarm Resolution
1	Door Open	1. The door is opened by the user. 2. Wire is loose.	1. Close the door. 2. Check door sensor wiring.
2	Emergency alarm	1. The emergency button is pressed by the user. 2. Wire is loose.	1. Release the emergency button. 2. Check emergency button wiring.
3	SPD Fail	1. SPD is failed. 2. Wire is loose.	1. If faulty, change SPD. 2. Check SPD wiring.
4	All Rectifier Fail	1. SMR not communicating. 2. SMR are removed. 3. SMR is not ON. 4. Any fault in all SMRs.	1. Check SMR CAN wiring. 2. Check if all SMR are inserted properly. 3. Check if input MCCB is ON & input voltage is healthy. 4. Open the cover and check SMR red LED, if RED led is ON, remove one SMR and check individually.
5	System over temp	1. The system temperature is high. 2. FANs not working. 3. The temperature sensor failed.	1. Check if the system temperature is high. 2. Check if FANs are working OK. 3. Check temp sensor is working OK.
6	Mains Fail	1. SMR not communicating. 2. Input MCCB is OFF.	1. Check SMR CAN wiring and check if all SMR are inserted properly. 2. Check if input MCCB is ON & input voltage is healthy.

11.2.2 GUN-A Alarms

ii. These alarms are related to GUN-A,

S. No	Alarm Name	Alarm Cause	Alarm Resolution

1	E-Lock Failed - Group A	Locking of Gun-A failed.	1. This is only for the GBT connector. 2. Please check the connector e-lock configuration in display. 3. Check 12V pulse for LKA+ & LKA-. 4. Check gun lock feedback wires.
2	Gun Over-Temp - Group A	Gun temperature is going high.	1. Change vehicle and try again. 2. Observe temperature with an external device.
3	Rectifier Group Fail - Group A	1. SMR not communicating. 2. SMR are removed. 3. SMR is not ON. 4. Any fault in all SMRs.	1. Check SMR CAN wiring. 2. Check if all SMR are inserted properly. 3. Check if input MCCB is ON & input voltage is healthy. 4. Open the cover and check SMR red LED, if RED led is ON, remove one SMR and check individually.
4	Rectifier Group Communication Fail - Group A	1. SMR not communicating. 2. SMR are removed. 3. SMR is not ON.	1. Check SMR CAN wiring. 2. Check if all SMR are inserted properly. 3. Check if input MCCB is ON & input voltage is healthy.
5	Isolation Communication Fail - Group A	Isolation board's comm failed.	1. Check if the board is ON. 2. Check 24V at the power connector. 3. Check RS485 communication wires.
6	Output Short Circuit - Group A	The output is short.	1. It is reported from the power module. 2. Take a pilot controller to SMR CAN data on CAN port3. The baud rate is 125Kbps.
7	PLC board comm fail - Group A	PLC board communication failed.	1. Check PLC is ON. 2. Check 12V at the power connector. 3. Check PLC typesetting in display. 4. Check CAN communication wires.

11.2.3 GUN-B Alarms

These alarms are related to GUN-B,

S. No	Alarm Name	Alarm Cause	Alarm Resolution

1	E-Lock Failed - Group B	Locking of Gun-B failed.	1. This is only for the GBT connector. 2. Please check the connector e-lock configuration in display. 3. Check 12V pulse for LKA+ & LKA-. 4. Check gun lock feedback wires.
2	Gun Over-Temp - Group B	Gun temperature is going high.	1. Change vehicle and try again. 2. Observe temperature with an external device.
3	Rectifier Group Fail - Group B	1. SMR not communicating. 2. SMR are removed. 3. SMR is not ON. 4. Any fault in all SMRs.	1. Check SMR CAN wiring. 2. Check if all SMR are inserted properly. 3. Check if input MCCB is ON & input voltage is healthy. 4. Open the cover and check SMR red LED, if RED led is ON, remove one SMR and check individually.
4	Rectifier Group Communication Fail - Group B	1. SMR not communicating. 2. SMR are removed. 3. SMR is not ON.	1. Check SMR CAN wiring. 2. Check if all SMR are inserted properly. 3. Check if input MCCB is ON & input voltage is healthy.
5	Isolation Communication Fail - Group B	Isolation board's comm failed.	1. Check if the board is ON. 2. Check 24V at the power connector. 3. Check RS485 communication wires.
6	Output Short Circuit - Group B	The output is short.	1. It is reported from the power module. 2. Take a pilot controller to SMR CAN data on CAN port3. The baud rate is 125Kbps.
7	PLC board comm fail - Group B	PLC board communication failed.	1. Check PLC is ON. 2. Check 12V at the power connector. 3. Check PLC setting type in display. 4. Check CAN communication wires.

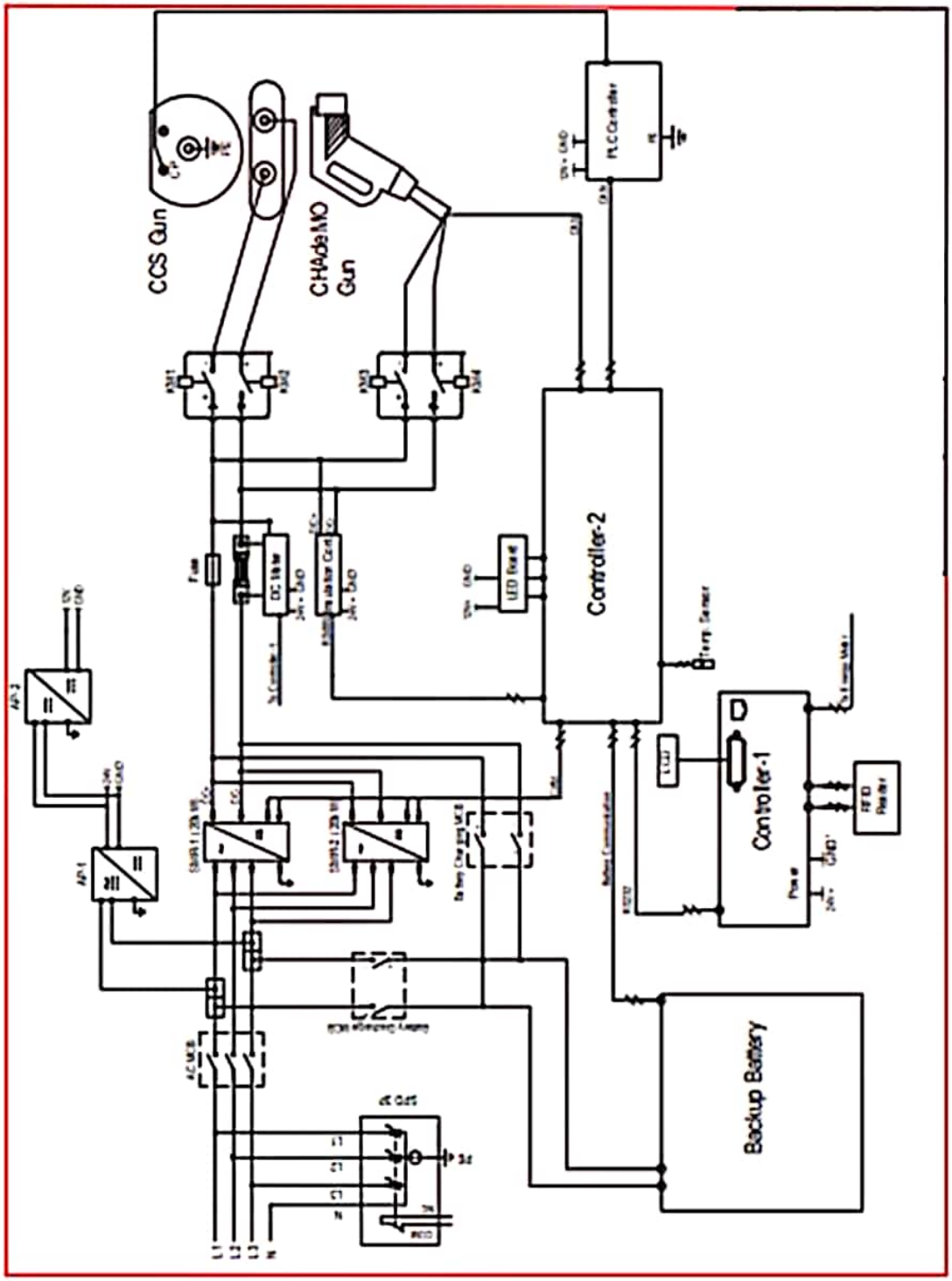
SECTION 12 PREVENTIVE MAINTENANCE

Harmony EV chargers are conservatively designed by Exicom. These are equipped with all advance digital circuits. These systems are designed to provide trouble free service with minimum maintenance. However, a regular periodic maintenance program should be followed. Table given below provides the schedule of maintenance procedure in detail,

ITEMS	INSPECTION PERIOD	PROCEDURE
Ventilation and opening	Monthly	Check that intake and exhaust air openings are not obstructed.
Cabinet Assemblies	Monthly	Remove dust and foreign particles within the chassis using compressed air or blower. Check mounting bolts and terminals for looseness. Tighten them carefully.
Controls and indications	Six month / Twelve months	Check switches and controls for operability. Replace if any damage or malfunctioning is observed.
		Check the cable for Input power and internal wiring to components.
		Check for cracks or broken insulation.
		Inspect the general condition of PCBs.
		Check the components for evidence of overheating cracks or peeling. Repair or replace board if necessary. Tighten screw or nuts.
Internal components	Twelve months	Inspect PCB, connectors for loose electrical connects. Tighten the mounting screw and replace defective sockets, if any. Inspect electric wiring for broken solder connections, evidence of peeled insulation and general deterioration, repair or replace damaged wiring. It carries no serviceable part hence no part should be tampered on site.
Charging Gun/Socket	Six month	As these are the most used items from the chargers, So please ensure firm connections of these items with the charger.
Interconnection of Batteries	One month	Check the interconnection wires between two backup batteries, all connection should be as per WD and tight.

SECTION 13 SYSTEM SCHEMATIC DIAGRAM

The system components & wiring arrangements are as below,



SECTION 14 ANNEXURE-I

Input Cable, LUG & MCB/MCCB Selection table for cable length maximum up to 25 meters,

S. No	Description	Cable size Copper	Lugs	MCB/MCCB
1	EVDC 15 kW- DC001 (1G)	4CX16 sq-mm(R,Y,B,N)	Ring type Lugs 16 sq-mm, M8	63A, 4P MCB
		1CX 16 sq-mm (PE)	Ring 16 sq-mm, M8	
2	EVDC 20 kW- DC001(2G)	4CX16 sq-mm (R,Y,B,N)	Ring type Lugs 16 sq-mm, M8	63A, 4P MCB
		1CX 16 sq-mm (PE)	Ring 16 sq-mm, M8	
3	EVDC 30 kW- DC001(2G)	4Cx25 sq-mm (R,Y,B,N)	Lugs 25 sq-mm M6	100A, 4P MCB
		1CX 16 sq-mm	Lug 16 sq-mm, M8	
4	EVDC 30 kW Wall-box (2G)	4Cx25 sq-mm (R,Y,B,N)	Ring type Lug 25 sq-mm M8	100A, 4P MCB
		1CX 16 sq.mm (PE)	Ring type Lug 16 sq-mm, M8	
5	**EVDC 40 kW Portable (2G)**	**4Cx25 sq-mm (R,Y,B,N)**	**Pin type lug 25 sq-mm**	**100A, 4P MCB**
		1CX 16 sq-mm (PE)	**Pin type lug 16 sq-m**	
6	EVDC 60 kW Harmony(2G)	4Cx35 sq-mm (R,Y,B,N)	Ring type lug 35 sq-mm, M8	150A, 4P MCB
		1CX 16 sq-mm (PE)	Ring type lug 16 sq-mm, M8	
7	EVDC 82 kW Harmony (3G)	4Cx50 sq-mm (R,Y,B,N)	Ring type lug 50 sq-mm, M8	200A, 4P MCCB
		1CX 16 sq-mm (PE)	Ring type lug 16 sq-mm, M8	
8	EVDC 120 kW Harmony(2G)	4Cx95 sq-mm (R,Y,B,N)	Ring type lug 95 sq-mm, M8	400A, 4P MCCB
		1CX 16 sq-mm (PE)	Ring type lug 16 sq-mm, M8	
9	EVDC 142 kW Harmony (3G)	4Cx120 sq-mm (R,Y,B,N)	Ring type lug 120 sq-mm, M8	400A, 4P MCCB
		1CX 35 sq-mm (PE)	Ring type lug 35 sq-mm M8	
10	EVDC 150 kW Harmony(2G)	4Cx150 sq-mm (R,Y,B,N)	Ring type lug 150 sq-mm. M8	400A, 4P MCCB
		1CX 35 sq-mm (PE)	Ring type lug 35 sq-mm, M8	
11	EVDC 180 kW Harmony (2G)	4Cx185 sq-mm (R,Y,B,N)	Ring type lug 185 sq-mm, M8	400A, 4P MCCB
		1CX 35 sq-mm (PE)	Ring type lug 35 sq-mm, M8	
12	EVAC 7.5 kW Type 2 (1G)	3CX10 sq-mm (R,N,E)	Pin type Lug 10 sq-mm	40A, 2P MCB

SECTION 15 ANNEXURE-II

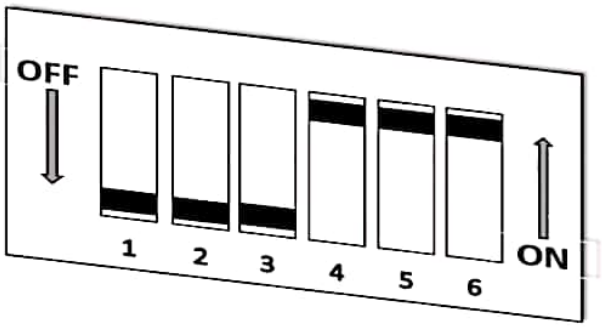
Rectifier/SMR 30kW/20kW modules are to be configured as per system requirement. Below is the procedure to set the DIP switches for the same.
Inside EV charger, rectifier/SMR magazine is provided with 2 sections i.e. upper and lower. According to the sections, the setting of the DIP switch for rectifiers are to done.

Attention! – Possible damage to the DIP switches!

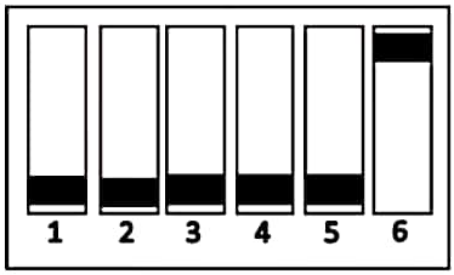
The DIP switches are slider switches, not the rocker switches. The DIP switches must be slide smoothly and must never be slide in a harsh way or pressed.

ON/OFF position of the Slider switches:

The illustration shows the position of the slider switches for setting ON or OFF, →



DIP switch position:

SMRGroup	DIP Switch	Function	Switch Positions
Group-A	Set switch no. 6 to ON	Switch ON DIP switch of Group A of the Rectifier magazine. i.e. Provide DC Energy to the GUN-1 (CCS)	
Group-B	Set switch no. 5 to ON.	Switch ON DIP switch of Group B of the Rectifier magazine. i.e. Provide DC Energy to the GUN-2 (CHAdeMO)	

Thank you!

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