MALMBERGS

ELECTRIC VEHICLE CHARGER

EVC04 Series

Installation Guideline

Contents

SAFETY INFORMATION

CAUTION

RISK OF ELECTRIC SHOCK:

CAUTION: ELECTRIC VEHICLE CHARGER DEVICE SHALL BE MOUNTED BY A LICENSED OR AN EXPERIENCED ELECTRICIAN AS PER ANY REGIONAL OR NATIONAL ELECTRIC REGULATIONS AND STANDARDS IN EFFECT.

CAUTION

AC grid connection and load planning of the electric vehicle charging device shall be reviewed and approved by authorities as specified by the regional or national electric regulations and standards in effect. For multiple electric vehicle charger installations the load plan shall be established accordingly. The manufacturer shall not be held liable directly or indirectly for any reason whatsoever in the event of damages and risks that are borne of errors due to AC grid supply connection or load planning.

IMPORTANT - Please read these instructions fully before installing or operating

SAFETY WARNINGS

- Keep this manual in a safe place. These safety and operating instructions must be kept in a safe place for future reference.
- Check that the voltage marked on the rating label and do not use charging station without appropriate mains voltage.
- Do not continue to operate the unit if you are in any doubt about it working normally, or if it is damaged in any way - switch off the mains supply circuit breakers (MCB and RCCB). Consult your local dealer.
- The ambient temperature range should be between –35 °C and +55 °C (–25°C and +50 °C for RCCB equipped models: EVC04-AC***A-*) without direct sunlight and at a relative humidity of between 5 % and 95 %. Use the charging station only within these specified operating conditions.
- The device location should be selected to avoid excessive heating of the charging station. High operating temperature caused by direct sunlight or heating sources, may cause reduction of charging current or temporary interruption of charging process.
- The charging station is intended for outdoor and indoor use. It can also be used in public places.
- To reduce the risk of fire, electric shock or product damage, do not expose this unit to severe rain, snow, electrical storm or other severe weathers. Moreover, the charging station shall not be exposed to spilled or splashed liquids.
- Do not touch end terminals, electric vehicle connector and other hazardous live parts of the charging station with sharp metallic objects.
- Avoid exposure to heat sources and place the unit away from flammable, explosive, harsh, or combustible materials, chemicals, or vapors.
- Risk of Explosion. This equipment has internal arcing or sparking parts which should not be exposed to flammable vapors. It should not be located in a recessed area or below floor level.
- This device is intended only for charging vehicles not requiring ventilation during charging.

- To prevent risk of explosion and electric shock, ensure that the specified Circuit Breaker and RCD are connected to building grid.
- The lowest part of the socket-outlet shall be located at a height between 0,5 m and 1,5 m above ground level.
- Adaptors or conversion adapters are not allowed to be used. Cable extension sets are not allowed to be used.

⚠ WARNING: Never let people (including children) with reduced physical, sensory or mental capabilities or lack of experience and or knowledge use electrical devices unsupervised.

⚠ CAUTION: This vehicle charger unit is intended only for charging electric vehicles not requiring ventilation during charging.

GROUND CONNECTION WARNINGS

- Charging station must be connected to a centrally grounded system. The ground conductor entering the charging station must be connected to the equipment grounding lug inside the charger. This should be run with circuit conductors and connected to the equipment grounding bar or lead on the charging station. Connections to the charging station are the responsibility of the installer and purchaser.
- To reduce the risk of electrical shock, connect only to properly grounded outlets.
- WARNING : Make sure that during installing and using, the charging station is constantly and properly grounded.

POWER CABLES, PLUGS and CHARGING CABLE WARNINGS

- Be sure that charging cable is Type 2 socket compatible on charging station side.
- A damaged charging cable can cause fire or give you an electric shock. Do not use this product if the flexible Charging cable or vehicle cable is frayed, has broken insulation, or shows any other signs of damage.
- Ensure that the charge cable is well positioned thus; it will not be stepped on, tripped over, or subjected to damage or stress.
- Do not forcefully pull the charge cable or damage it with sharp objects.
- Never touch the power cable/plug or vehicle cable with wet hands as this could cause a short circuit or electric shock.
- To avoid a risk of fire or electric shock, do not use this device with an extension cable. If the mains cable or vehicle cable is damaged it must be replaced by the manufacturer, its service agent, or similarly qualified persons in order to avoid a hazard.

WALL MOUNTING WARNINGS

- Read the instructions before mounting your charging station on the wall.
- Do not install the charging station on a ceiling or inclined wall.
- Use the specified wall mounting screws and other accessories.
- This unit is rated for indoor or outdoor installation. If this unit is mounted outdoors, the hardware for connecting the conduits to the unit must be rated for outdoor installation and be installed properly to maintain the proper IP rating on the unit.

DESCRIPTION

1 - MODEL DESCRIPTION

Model Name	**MODEL DESCRIPTION: EVC04-AC**-*** EVC04 : Electric Vehicle AC Charger (Mechanical Cabinet 04) 1st Asterisk (*) : Rated Power 7 : 7.4 kW (1Phase Supply Equipment) 11 : 11 kW (3Phase Supply Equipment) 22 : 22 kW (3Phase Supply Equipment) 2nd Asterisk (*) can include combinations of the following communication module options. RFID reader is standard equipment for all of the model variants. "S" option must be included for selecting combinations of W and L: Blank : No connectivity module except RFID reader S : Smart Board with Ethernet Port W : Wi-Fi module or WiFi & Bluetooth module L : LTE / 3G / 2G module P : ISO 15118 PLC module 3rd Asterisk (*) : Can be one of the following: Blank : No Display D : 4.3" TFT color display 4th Asterisk (*) can include combinations of the following: Blank : No RCCB A : Charging unit with Type-A RCCB MID: Charging unit with MID Meter 5th Asterisk (*) can be one of the following: Blank : Case-B Connection with normal socket T2S : Case-B Connection with shuttered socket T2P : Case-C Connection with Type-2 plug T1P : Case-C Connection with Type-1 plug
Cabinet	EVC04

Table-1

2 - MODEL REFERENCES

Model reference table does not include all model variants of EVC04.

	Single phase	Three phase	Smart	LTE	WiFi	Display	MID Meter	Type 2 socket	Shuttered type 2 socket output	RCCB Type-A	DC 6mA RCD	Type-2 Attached Cable	Type-1 Attached Cable
EVC04-AC7SW	x		x		x			x			x		
EVC04-AC7SWA	x		x		x			x		x	x		
EVC04-AC7SLA-T2P	x		x	x						x	x	x	
EVC04-AC7SWDA-T2S	x		x		x	x			x	x	x		
EVC04-AC7SLWDA-T1P	x		x	x	x	x				x	x		x
EVC04-AC11SLD		x	x	x		x		x			x		
EVC04-AC11SWDA		x	x		x	x		x		x	x		
EVC04-AC11SLWDA-T2P		x	x	x	x	x				x	x	x	
EVC04-AC11SLWDA-T2S		x	x	x	x	x			x	x	x		
EVC04-AC22SLDMID		x	x	x		x	x	x			x		
EVC04-AC22SWDA		x	x		x	x		x		x	x		
EVC04-AC7SWD-T2P (2E)		x	x		x	x		x		x	x		
EVC04-AC22SLWDA-T2P		x	x	x	x	x				x	x	x	
EVC04-AC22SLWDA-T2S		x	x	x	x	x			x	x	x		
EVC04-AC22SWDMID(CT)-T2P		x	x		x	x					x	x	

Table-2

GENERAL INFORMATION

1 - INTRODUCTION OF THE PRODUCT COMPONENTS

Socket Equipped Models

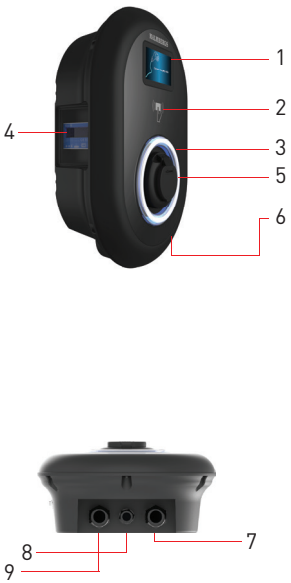


Figure-1

Tethered Cable Models

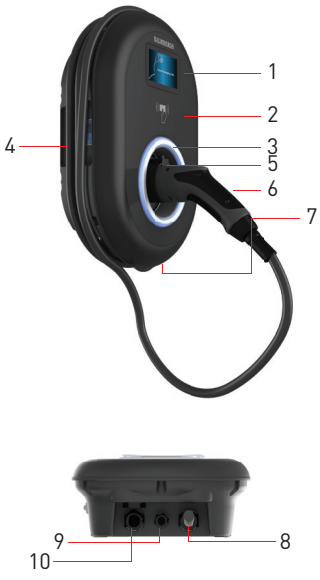


Figure-2

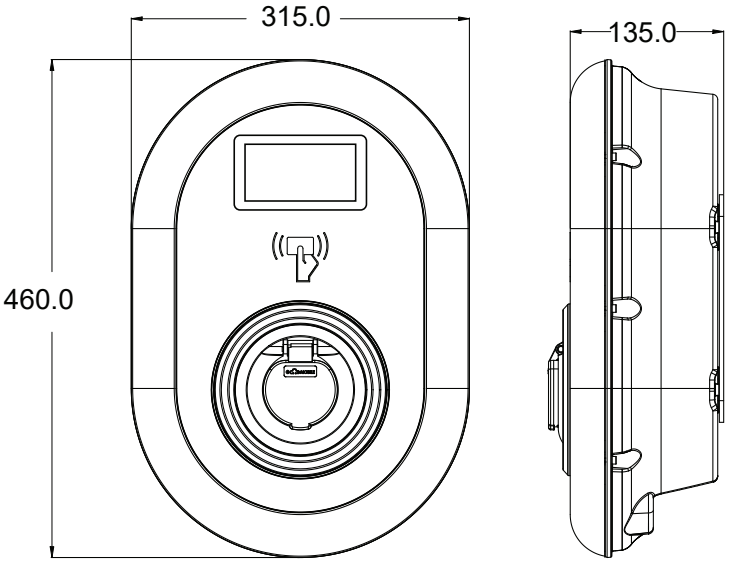
en **Socket Models**

1- Information Display
2- RFID Card Reader
3- Status indicator LED
4- MID Meter Display
5- Socket Outlet
6- Product Label
7- Charging station communication cable gland nut
8- Charging station communication cable gland nut
9- Charging station supply inlet gland nut

en **Tethered Cable Models**

1- Information Display
2- RFID Card Reader
3- Status indicator LED
4- MID Meter Display
5- Dummy Socket
6- Charging Plug
7- Product Label
8- Charging cable
9- Charging station communication cable gland nut
10- Charging station supply inlet gland nut

2 - DIMENSIONAL DRAWINGS



3 - ELECTRIC VEHICLE CHARGING STATION EXPLODED PICTURE

3.1 RCD MODELS

3.1.1 - TETHERED CABLE MODELS

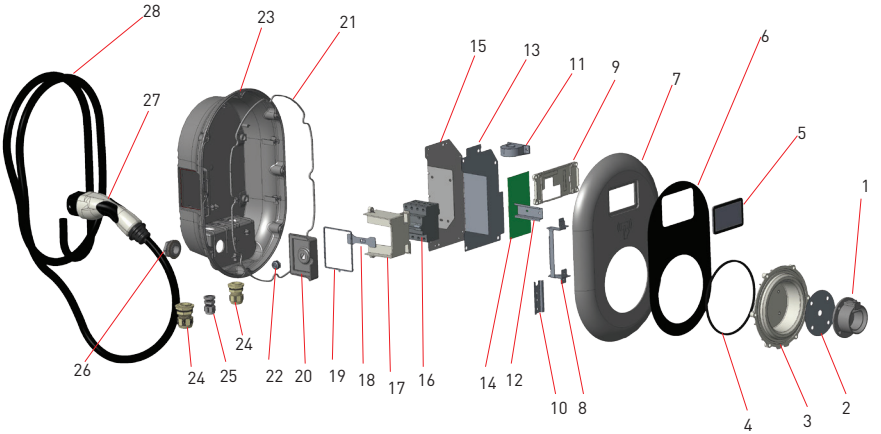


Figure-3

NO	PART DESCRIPTION	NUMBER
1	Socket	1
2	Cosmetic Frame Label	1
3	Status Information LED	1
4	Sealing Ring	1
5	Display	1
6	Cosmetic Label	1
7	Front Cover	1
8	Hinge	1
9	Display Housing	1
10	Real Terminal Connection	1
11	DC Sensor	1
12	Rail Connection	1
13	Card Isolation Plate	1
14	Card Isolation Plate	2

NO	PART DESCRIPTION	NUMBER
15	Board Mount Metal Plate	1
16	RCCB Component	1
17	RCCB Housing	1
18	RCCB Lock Bolt	1
19	Sealing Ring	1
20	RCCB Side Cover	1
21	Sealing Ring	1
22	RCCB Lock Cylinder	1
23	Rear Cover	2
24	Cable Bush M32x1.5	1
25	Cable Bush M20x1.5	1
26	Plastic Blind Flange	1
27	Charging Plug	1
28	Charging Cable	1

3.1.2 - SOCKET EQUIPPED MODELS

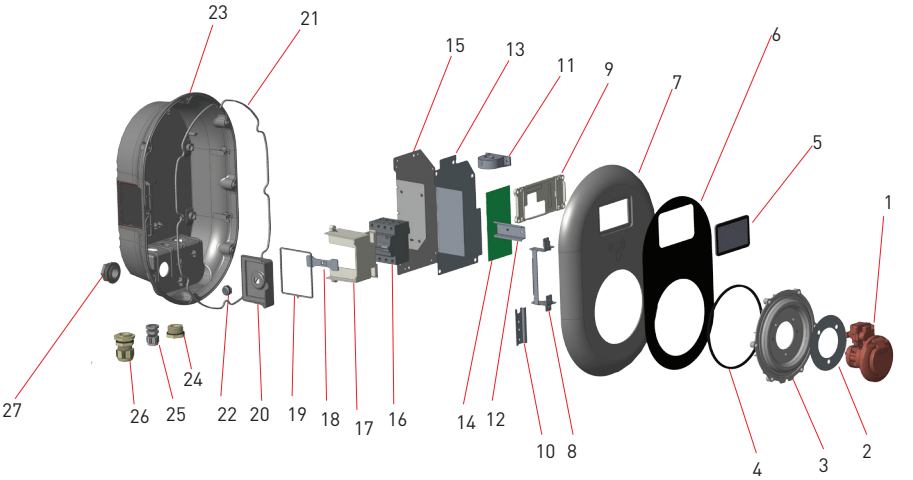


Figure-4

NO	PART DESCRIPTION	NUMBER
1	Socket	1
2	Cosmetic Frame Label	1
3	Status Information LED	1
4	Sealing Ring	1
5	Display	1
6	Cosmetic Label	1
7	Front Cover	1
8	Hinge	1
9	Display Housing	1
10	Real Terminal Connection	1
11	DC Sensor	1
12	Rail Connection	1
13	Card Isolation Plate	1
14	Card Isolation Plate	2

NO	PART DESCRIPTION	NUMBER
15	Board Mount Metal Plate	1
16	RCCB Component	1
17	RCCB Housing	1
18	RCCB Lock Bolt	1
19	Sealing Ring	1
20	RCCB Side Cover	1
21	Sealing Ring	1
22	RCCB Lock Cylinder	1
23	Rear Cover	2
24	Cable Bush M20x1.5	1
25	Plastic Blind Flange	1
26	Cable Bush M32x1.5	1
27	Plastic Blind Flange	1

3.2 MID MODELS

3.2.1 - TETHERED CABLE MODELS

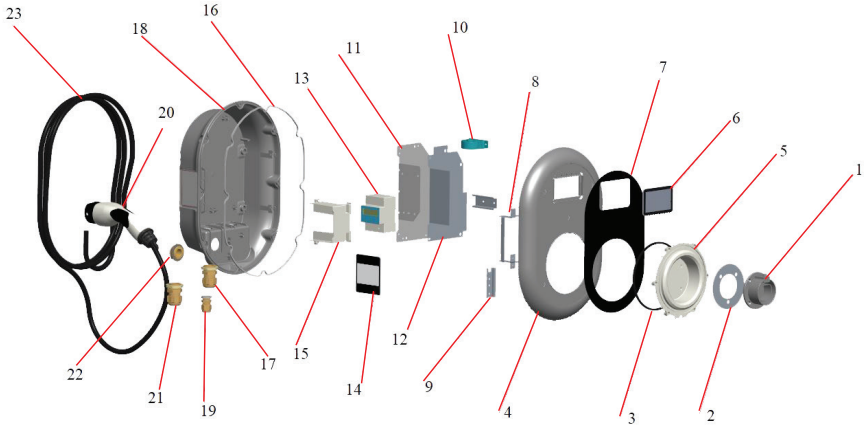


Figure-5

NO	PART DESCRIPTION	NUMBER
1	Socket	1
2	Cosmetic Frame Label	1
3	Sealing Ring	1
4	Front Cover	1
5	Status Information LED	1
6	Display	1
7	Cosmetic Label	1
8	Hinge	1
9	Real Terminal Connection	1
10	DC Sensor	1
11	Card Isolation Plate	1
12	Card Isolation Plate	1
13	MD Component	1
14	MID Glass	1

NO	PART DESCRIPTION	NUMBER
15	RCCB Housing	1
16	Sealing Ring	1
17	Cable Bush M32x1.5	1
18	Rear Cover	1
19	Cable Bush M20x1.5	1
20	Charging Plug	1
21	Cable Bush M32x1.5	1
22	Plastic Blind Flange	1
23	Charging Cable	1

3.2.2 - SOCKET EQUIPPED MODELS

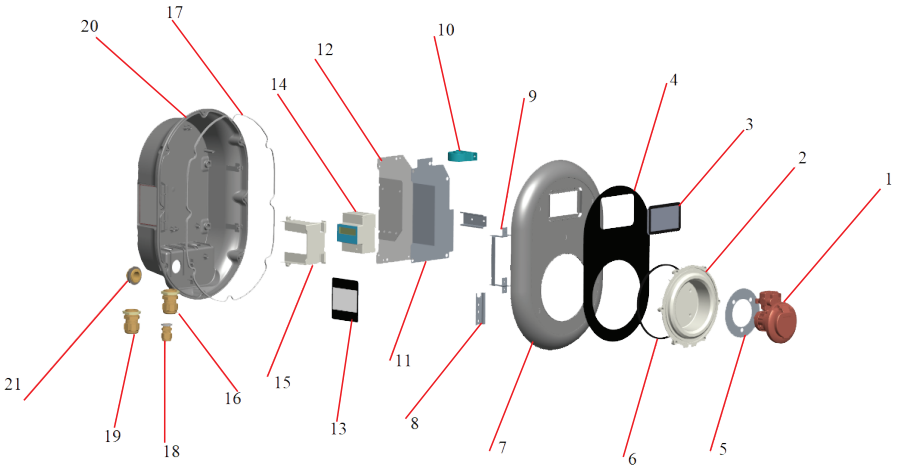


Figure-6

NO	PART DESCRIPTION	NUMBER
1	Socket	1
2	Cosmetic Informatıon LED	1
3	Display	1
4	Csmetic Label	1
5	Cosmetic Frame Label	1
6	Sealing Ring	1
7	Front Cover	1
8	Real Terminal Connection	1
9	Hinge	1
10	DC Sensor	1
11	Card İsolatıon Plate	1
12	Card İsolatıon Plate	1
13	MID Glass	1
14	MID Component	1

NO	PART DESCRIPTION	NUMBER
15	Rccb Housing	1
16	Cable Bush M32X1.5	1
17	Sealing Ring	1
18	Cable Bush M20X1.5	1
19	Cable Bush M32X1.5	1
20	Rear Cover	1
21	Plastic Blind Flange	1

REQUIRED EQUIPMENT, TOOLS and ACCESSORIES

1 - SUPPLIED INSTALLATION EQUIPMENT and ACCESSORIES

Dowels (M8x50 Plastic Dowels)	
Torx T25 Security Screw (M6x75)	
Torx T20 Security L-Wrench	
Wrench	
Triangle Key	
RJ45 Male Connector	

Table-3

2 - RECOMMENDED EQUIPMENTS AND TOOLS

		
Drill Bit 8mm	Impact Drill	PC
		
Volt Indicator	Torx T25 Security Screwdriver	Water Level
		
Flathead Screwdriver (Tip width 2.00-2.5 mm)	Pointed Spudger	Right Angle Screwdriver Adapter / Torx T20 Security Bit
		
RJ45 Crimping Tool	Cat5e or cat6 ethernet cable	

Table-4

TECHNICAL SPECIFICATIONS

This product is compliant to IEC61851-1 (Ed3.0) standard for Mode 3 use.

Model		EVC04-AC22 Series	EVC04-AC11 Series
IEC Protection class		Class - I	Class - I
Vehicle Interface	**Socket Model**	Socket TYPE 2 (IEC 62196)	Socket TYPE 2 (IEC 62196)
	Cable Model	Cable with TYPE 2 (IEC 62196) Female Plug	Cable with TYPE 2 (IEC 62196) Female Plug
Voltage and Current Rates		400VAC 50/60 Hz - 3-phase 32A	400VAC 50/60 Hz- 3-phase 16A
AC Maximum Charge Output		22kW	11kW
Idle Power Consumption		3.5W	3.5W
Required Circuit Breaker on AC Mains		4P-40A MCB Type-C	4P-20A MCB Type-C
Required Leakage Current Relay on AC Mains (for products which are not equipped with RCCB Type A)		4P -40A - 30mA RCCB Type-A	4P -20A - 30mA RCCB Type-A
Required AC Mains Cable		5x 6 mm² (< 50 m) External Dimensions: Ø 18-25 mm	5x4 mm² (< 50 m) External Dimensions: Ø 18-25 mm

Model		EVC04-AC7 Series
IEC Protection class		Class - I
Vehicle Interface	**Socket Model**	Socket TYPE 2 (IEC 62196)
	Cable Model	Cable with TYPE 2 (IEC 62196) Female Plug
Voltage and Current Rates		230VAC 50/60 Hz - 1-phase 32A
AC Maximum Charge Output		7.4kW
Idle Power Consumption		3.5W
Required Circuit Breaker on AC Mains		2P-40A MCB Type-C
Required Leakage Current Relay on AC Mains (for products which are not equipped with RCCB Type A)		2P -40A - 30mA RCCB Type-A
Required AC Mains Cable		3x 6 mm² (< 50 m) External Dimensions: Ø 13-18 mm

CONNECTIVITY

Ethernet	10/100 Mbps Ethernet (Standard with Smart Options)
Wi-Fi (Optional)	Wi-Fi 802.11 a/b/g/n/ac
Bluetooth (Optional)	BT 4.2 / BT5.0
Celullar (Optional)	LTE: B1 (2100 MHz), B3 (1800 MHz), B7 (2600 MHz), B8 (900 MHz), B20 (800 MHz), B28A (700 MHz) WCDMA: B1 (2100 MHz), B8 (900 MHz) GSM: B3 (1800 MHz), B8 (900 MHz)

OTHER FEATURES (Connected Models)

Diagnostics	Diagnostics over OCPP WebconfigUI
Software Update	Remote software update over OCPP WebconfigUI update Remote software update with server

AUTHORIZATION

RFID	ISO-14443A/B and ISO-15693

MECHANIC SPECIFICATIONS

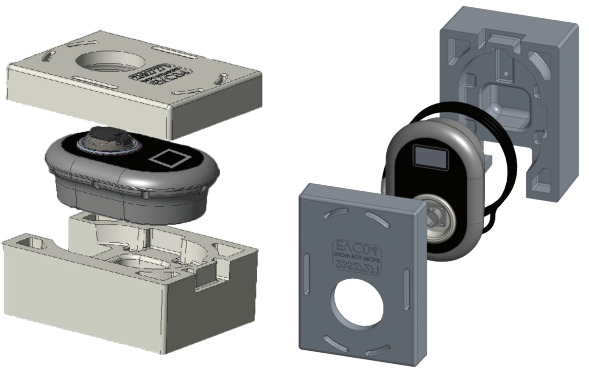
Material	Plastic
Size	315 mm (Width) x 460 mm (Height) x 135 mm (Depth)
Dimensions (Package)	405 mm (Width) x 530 mm (Height) x 325 mm (Depth)
Weight (Product)	5 kg for socket equipped model, 6,8kg TETHERED CABLE model
Weight with package	7,1 kg for socket equipped model, 8,9kg TETHERED CABLE model
AC Mains Cable Dimensions	For 22 kW version Ø 18-25 mm For 11 kW version Ø 18-25 mm For 7.4 kW version Ø 13-18 mm
Cable Inlets	AC Mains / Ethernet / Modbus

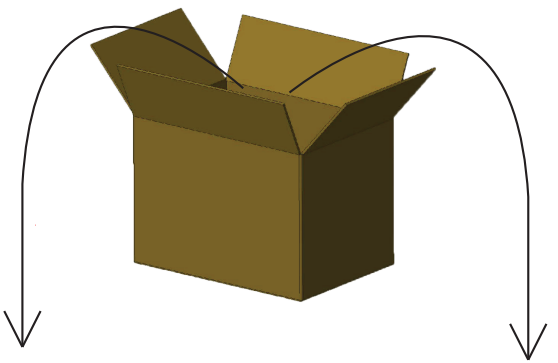
ENVIRONMENTAL TECHNICAL SPECIFICATIONS

Protection Class	Ingress Protection Impact Protection	IP54 IK10 (Optional display have IK08 protection)
Usage Conditions	Temperature Humidity Altitude	-35 °C to 55 °C (without direct sunlight) (–25°C to +50 °C for RCCB equipped models) 5% - 95% (relative humidity, no deviation) 0 - 4,000m

INSTALLING CHARGE STATION

1 - BOX CONTENTS FOR CHARGING STATION WITH SOCKET AND CABLE





Installation and User Guide

1 Master +

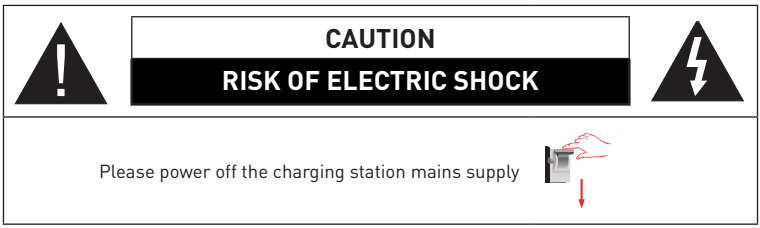
2 User RFID Card

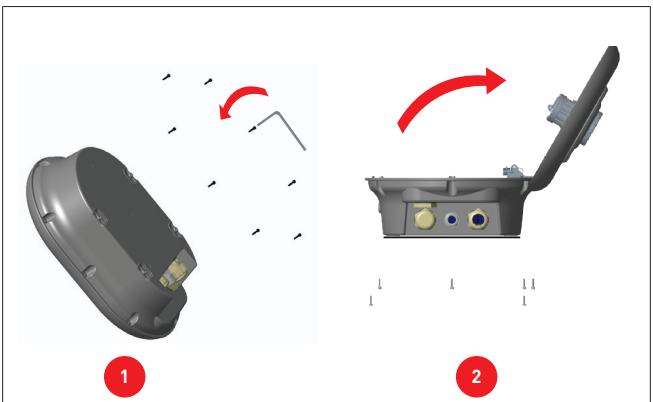
2 - PRODUCT INSTALLATION STEPS

CAUTION!

- Ensure that ground resistance of the installation less than 100ohms
- Prior to mounting your charging station on the wall, read these instructions.
- Do not mount your charging station to the ceiling or an inclined wall.
- Use the wall mounting screws and other accessories specified.
- This charging station is classified as indoor and outdoor installation compatible. If the device is installed outside the building, the hardware that will be used to connect the cables to the charger shall be compatible with outdoor use and the charging station shall be mounted preserving the IP rate of the charger.

2.1 OPENING THE COVER OF THE CHARGING STATION





1- Remove the cover screws with Torx T20 security L-Wrench or Right Angle Screwdriver Adapter using Torx T20 Security Bit.
2- Open the cover.

2.2 - WALL MOUNT INSTALLATION

Wall mount installation is common for all charging station models.

1- Open the product front cover following the instructions for cover opening under section 2.1.

2- Center the charging station using the alignment template, and mark the drill bit holes with a pencil.

3- Drill the wall on the marked points using the impact drill (8mm drill bit).

4- Place the dowels into the holes.

5- Tighten the security scews (M6x75) of the product using Torx T25 Security Screwdriver.

6- Insert the open lead wires into the charging station through the hole on the lower left. Follow the AC Mains Connection instructions on the next pages, see section 2.3 or 2.4 depending on the model of the charger. (Single/Three Phase)

7- In case you mount the charging station to conductive metal surface, you can make ground connection via "right-bottom" screw using Earth extension cable as shown in figure-8.

To make the grounding to the metal surface, you need to disassemble the grounding cable and move it from position "a" to position "b" as shown in figure-8. To assemble the grounding cable to position "b", the plastic rubber and M6x30 screw which are inside the artwork package should be used and the right-down screw to install the charger to the metal surface should be this M6x30 screw.

8- Tighten the cable glands as shown in the figure. Before close the cover of the charging station, follow instructions in sections 2.6 and 2.7 if any function related to these sections are used.

NOTE : Also check section 3 commissioning.

9- To close the cover of the charging station, tighten the cover screws that you removed before with Torx T20 Security L-Wrench or Right Angle Screwdriver Adapter using Torx T20 Security Bit.

10- Mounting the charging station on wall is now finished.

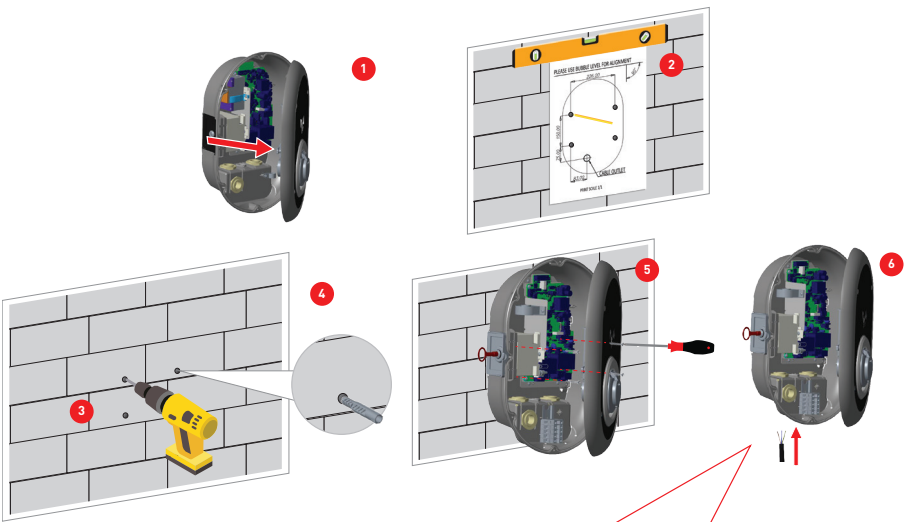


Figure-7

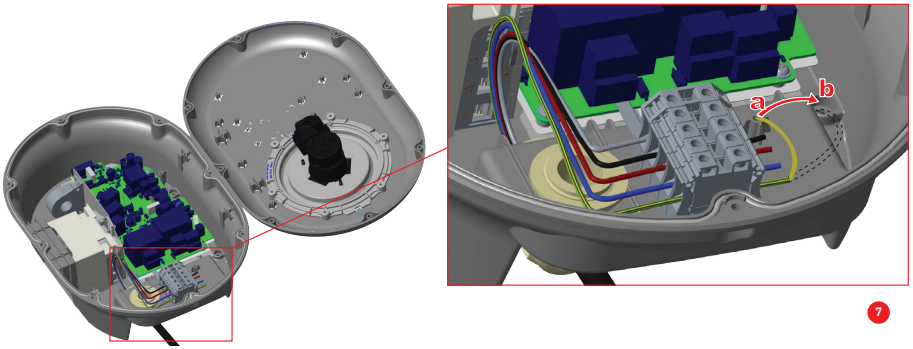


Figure-8

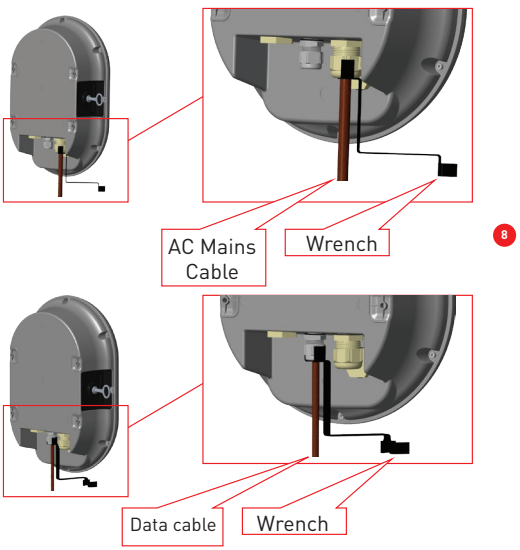


Figure-9

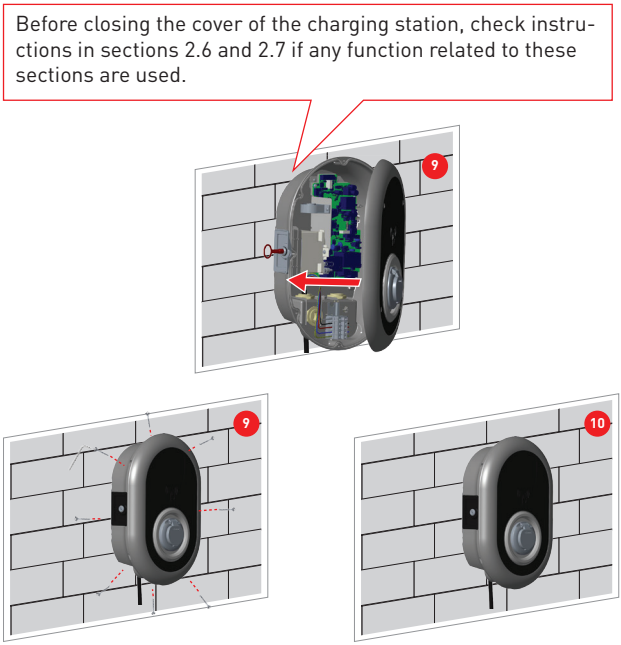


Figure-10

2.3- SINGLE PHASE CHARGING STATION AC MAINS CONNECTION

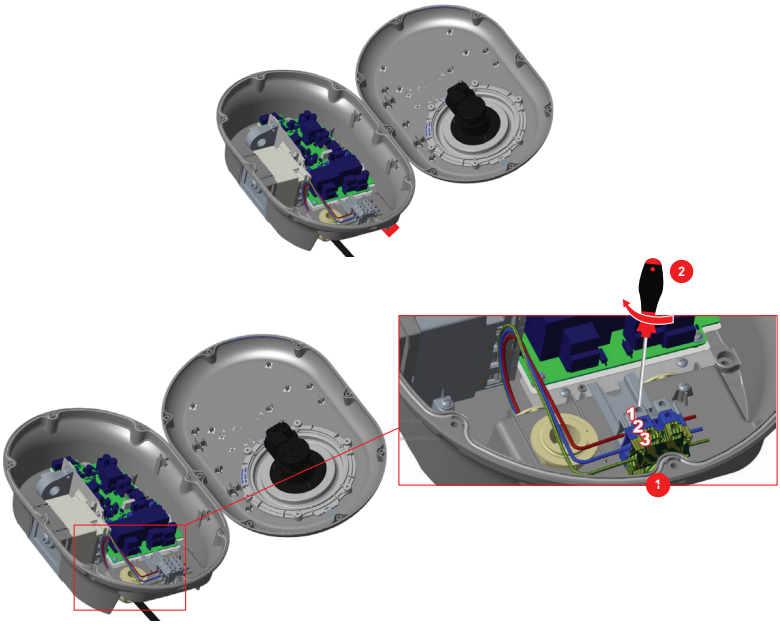


Figure-11

1- Insert the cables to the terminal block as shown in the image. Check the table-5 below to match Electric Terminal number with AC Cable Color.

2- Tighten the screws on the terminal block as shown in the image with the tightening tourqe of 2.5Nm.

Electric Terminal	AC Cable Color
1	AC L1 (Brown)
2	AC Neutral (Blue)
3	Earth (Green-Yellow)

Table-5

2.4- THREE PHASE CHARGING STATION AC MAINS CONNECTION

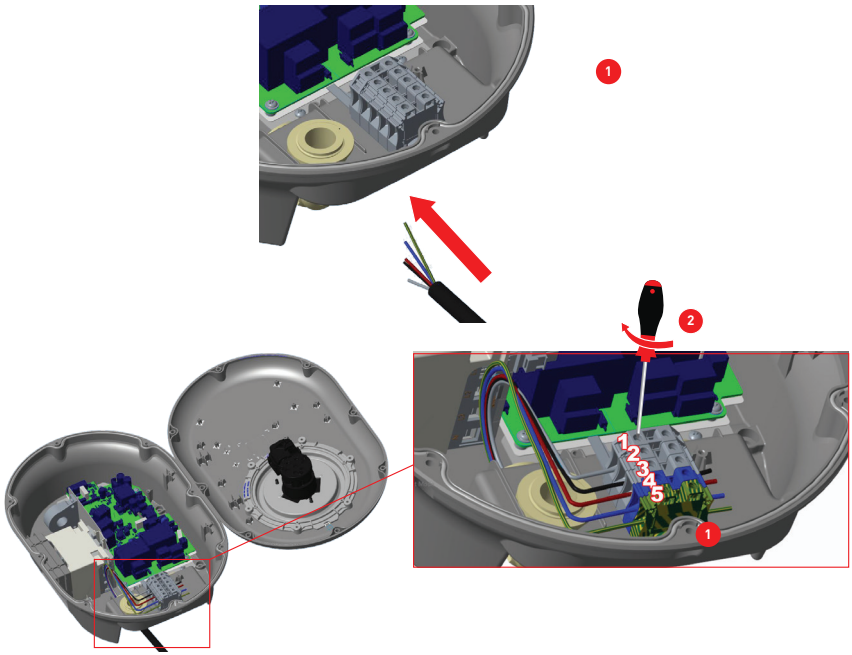


Figure-12

1- Insert the cables to the terminal block as shown in the image. Check the table-6 below to match Electric Terminal number with AC Cable Color.

2- Tighten the screws on the terminal block as shown in the image with the tightening tourqe of 2.5Nm.

Electric Terminal	AC Cable Color
1	AC L3 (Grey)
2	AC L2 (Black)
3	AC L1 (Brown)
4	AC Neutral (Blue)
5	Earth (Green-Yellow)

Table-6

2.5 - ADJUSTING CURRENT LIMITER

The arrow in the middle of the rotary switch must be adjusted by gently rotating with a flathead screwdriver (Tip width 2.00-2.5 mm)to the position of the required current rate. The device current limiter is set to 16A in production by default.

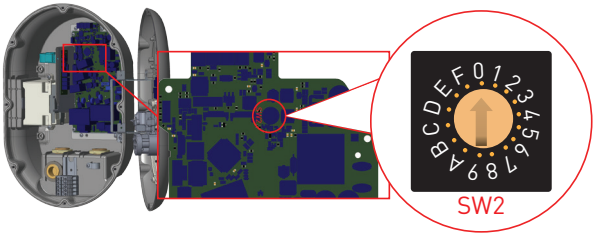


Figure-13

Current Limiter Position	Phase	Current Limit		
		22 kW	11kW	7.4kW
0	1 Phase	10 A	10 A	10 A
1		13 A	13 A	13 A
2		16 A	16 A	16 A
3		20 A		20 A
4		25 A		25 A
5		30 A		30 A
6		32 A		32 A
7				
8	3 Phase	10 A	10 A	
9		13 A	13 A	
A		16 A	16 A	
B		20 A		
C		25 A		
D		30 A		
E		32 A		
F				

Table-7

Required Circuit Braker on AC Mains	
EV Charging Station Current Limiter Setting	C-Curve MCB
10 A	13 A
13 A	16 A
16 A	20 A
20 A	25 A
25 A	32 A
30 A	40 A
32 A	40 A

Table-8

2.6 - DIP SWITCH SETTINGS

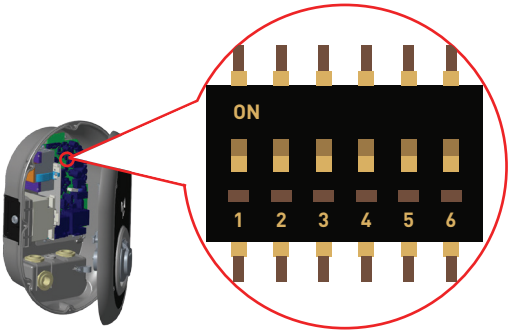


Figure-14

Brief descriptions of the DIP switch pin settings can be found in below table.

Pin Number	Description
Pin-1	Reserved
Pin-2	External Enable Input Functionality
Pin-3	Locked Cable Function (only for socket models)
Pin-4-5-6	Power Optimizer (Requires Optional Accessories)

Table-9

2.6.1 - DATA CABLE CONNECTION

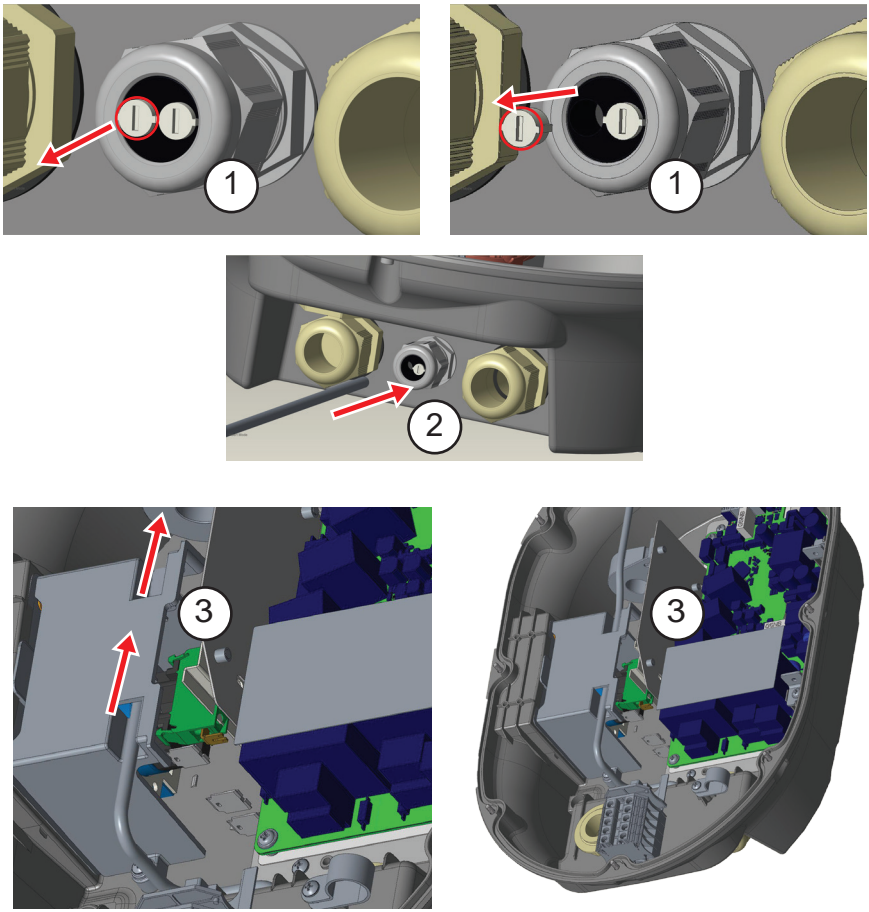


Figure-15

1- Remove rubber cork.
2- Insert cable through the cable hole.
3- Insert the cable through the RCCB housing holes.
4- Finally, to connect the wires on mainboard, check the following sections in 2.6 and 2.7 depending on the function(s) to be used.

2.6.2 - EXTERNAL ENABLE INPUT FUNCTIONALITY

Your charging station has external potential free enable / disable functionality which can be used for integration of your charging station to carpark automation systems, energy supplier ripple control devices, time switches, photovoltaic inverters, auxiliary load control switches, external key lock switches etc. DIP switch position 2 is used for enabling and disabling this functionality.

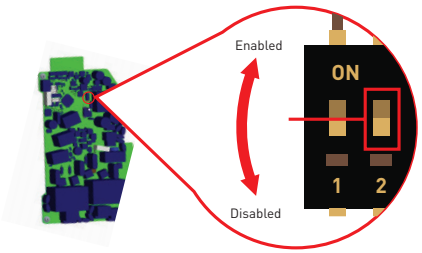


Figure-16

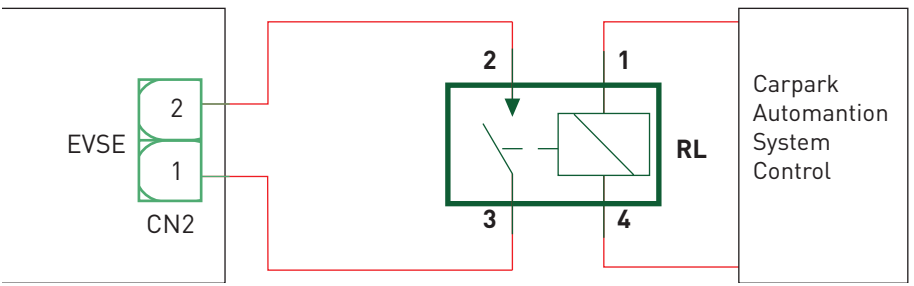


Figure-17

If the external relay (RL) is in non-conducting (open), the charging station will not be not be able to charge the electric vehicle.
You can connect potential free input signals as shown in above circuitry (see figure-17). See section 2.6.1-Data Cable Connection.

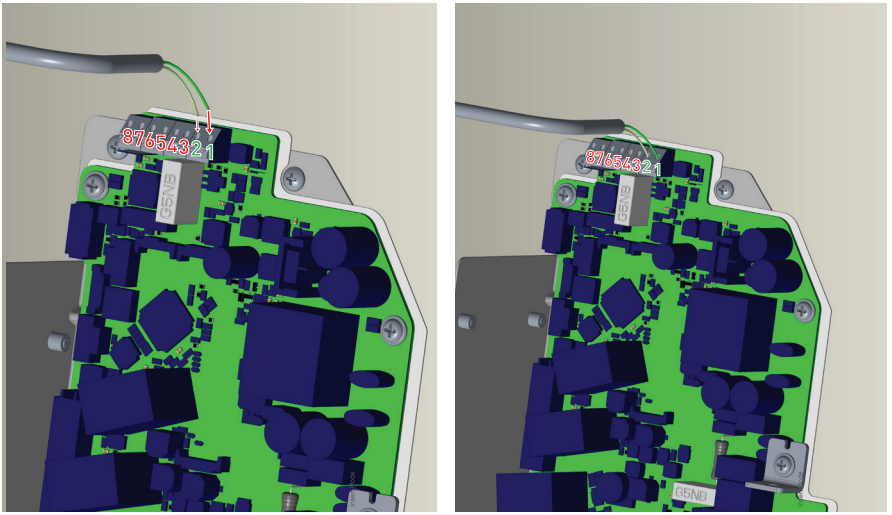


Figure-18

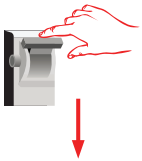
Cable Terminal	Cable Color
1 (CN2-1)	Green
2 (CN2-2)	Green + White Green

Table-10

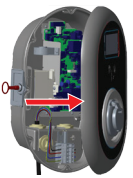
2.6.3 - LOCKED CABLE FUNCTION (Model with Socket)

The cable becomes locked and your socket model charging station starts behaving as a cable model.

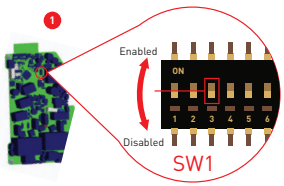
1- Turn off the power of your charging station.



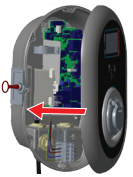
2- Open the product cover as described in the installation manual.



3- To enable locked cable function, toggle DIP switch pin 3 to ON position using pointed spudger or a plastic pointed tool. The DIP switch location is as shown in below figure.



4- Close the product cover as described in the installation manual.



5- Open the front cover of the socket outlet and plug the charging cable to the socket outlet.

6- Turn on the power to your charging station. The cable becomes locked and the charging station starts behaving as a cable model.

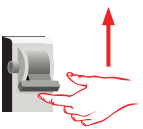


Table-11

2.6.4 - POWER OPTIMIZER (REQUIRES OPTIONAL ACCESSORIES)

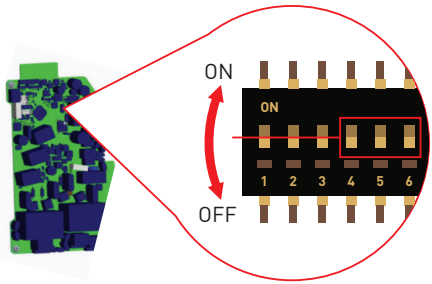


Figure-19

This feature is provided with an optional metering accessories which are sold separately. In power optimizer mode, the total current drawn from the main switch of the house by charging station and other household appliances is measured with current sensor integrated to the main power line. Current limit of the main power line of the system is set through the DIP switches inside the charging station. According to the limit set by the user, charging station adjusts its output charging current dynamically according to the measurement of main power line.

Last 3 DIP switch pins (4,5,6) corresponds to binary digits of the maximum current value as shown in the table-12 below. When 4, 5, 6 pins are in OFF position, power optimizer functionality is disabled.

DIP Switch Positions			Current Limit Value
4	5	6	
OFF	OFF	OFF	Power Optimizer Disabled
OFF	OFF	ON	16
OFF	ON	OFF	20
OFF	ON	ON	25
ON	OFF	OFF	32
ON	OFF	ON	40
ON	ON	OFF	63
ON	ON	ON	80

Table-12

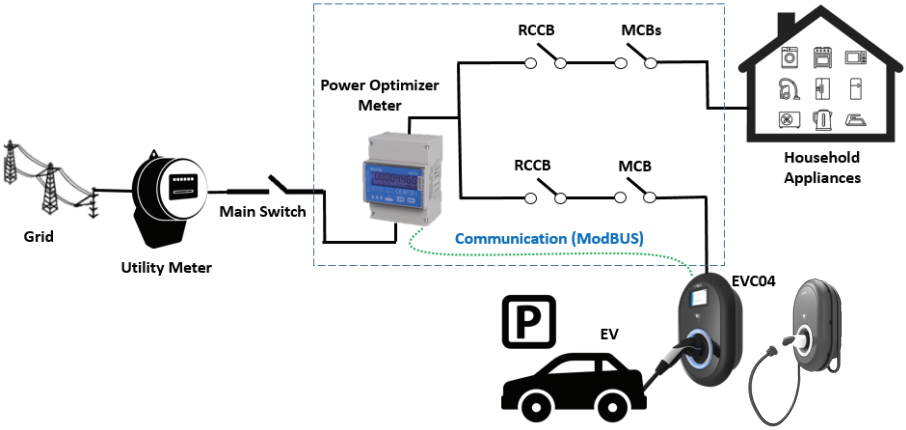
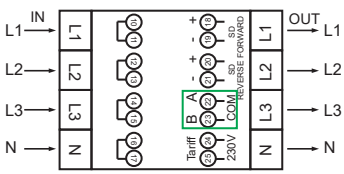


Figure-20

Power Optimizer Meter should be placed just after the main switch of the house as shown in the figure-20.

Power Optimizer Meter wiring connections can be made according to the information below. See section 2.6.1- Data Cable Connection

Three Phase



Single Phase

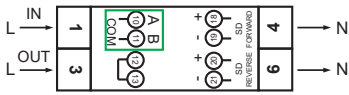


Figure-21

■ 22-23: A-B (COM) Modbus connection over RS485 for three phase charging station models. (See section 2.6.2- STP Connection)

■ 10-11: A-B (COM) Modbus connection over RS485 for single phase charging station models. (See section 2.6.2- STP Connection)

Related board wiring of Power Optimizer connections can be made as shown below:

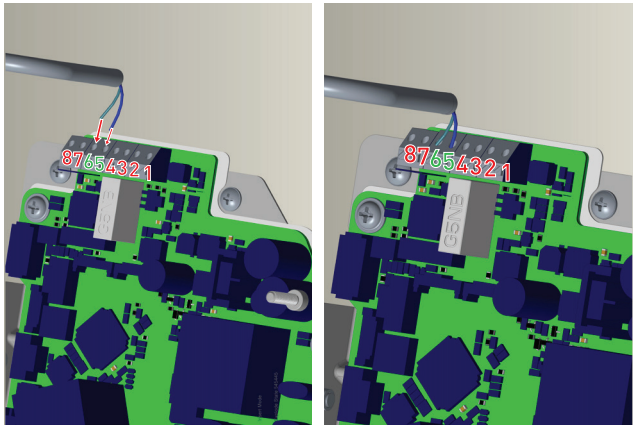


Figure-22

Cable Terminal	Cable Color	Description
6 (CN20-2)	White Blue	A (COM)
5 (CN20-1)	Blue	B (COM)

Table-13

2.7 - LOAD SHEDDING

This charging station supports load shedding functionality which provides immediate charging current reduction in case of limited supply. Load shedding triggering signal is a dry contact signal which must be provided externally.

When load shedding is activated, charging current reduces down to 8A. When load shedding is deactivated, charging continues with maximum available current.

You can connect potential free load shedding signal as shown in below. See figure-23,table-15 and table-16.

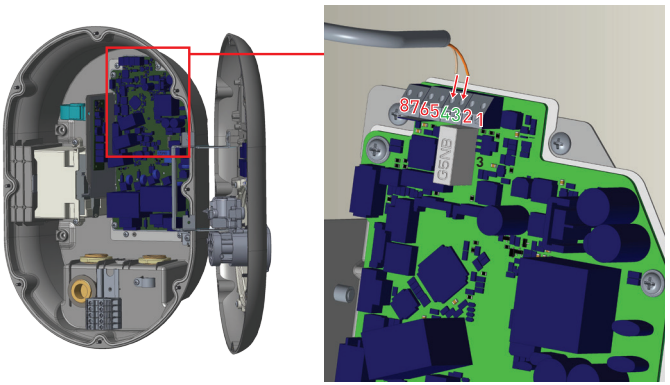


Figure-23

Cable Terminal	Input
3	Load Shedding Input +
4	Load shedding Input –

Table-15

Load Shedding Input State	Behaviour
Opened Contact	Charge at max. available current
Closed Contact	Charge at min. current (8A)

Table-16

2.8 - MONITORING OF WELDED RELAY CONTACTS FAILURE

According to IEC 61851-1 and EV/ZE Ready requirements, EVC04 EV Charging Station has welded contactor sensing function, and welded contactor information is provided as a contactor welded output signal from the control board. To detect welded contact failure for the relays, CN33 connector output terminals must be used.

In case of a welded contact for the relays CN33 connector output will be 230V AC. The output which has 230V AC should be connected to a shunt trip for RCCB triggering as shown in figure-24. The cabling should be done as shown in figure-25.

Connector (CN33) terminals must be connected to a Shunt trip module. Shunt Trip module is mechanically coupled to RCCB (or MCB) at the fuse box of the charging station.

The circuitry block diagram that must be used at the fuse box of the charging station is shown below.

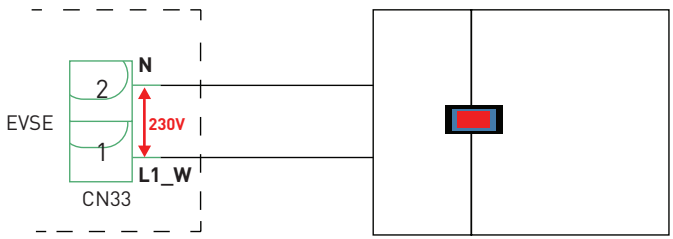


Figure-24

See section 2.6.1- Data Cable Connection

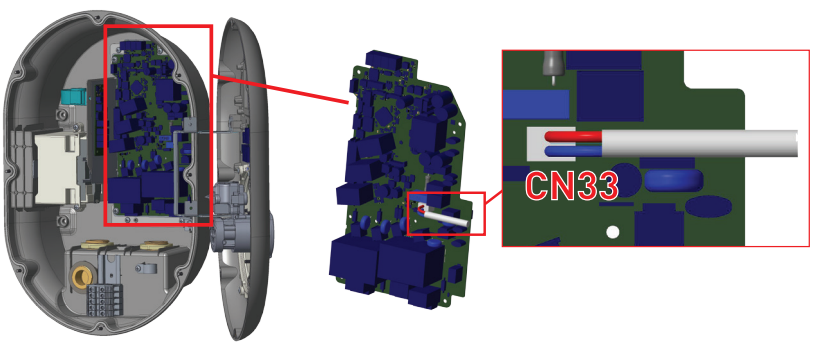


Figure-25

2.9 - FACTORY RESET

You must push the button on HMI board shown in figure-26 for factory reset. When you hold the button for 5 seconds user configuration will be reset to factory configuration. (e.g OCPP config, Network Config will be back to factory configuration.)

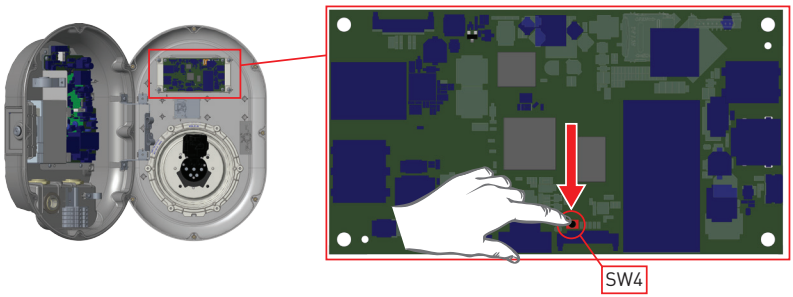


Figure-26

2.10 - OPEN RCD COVER

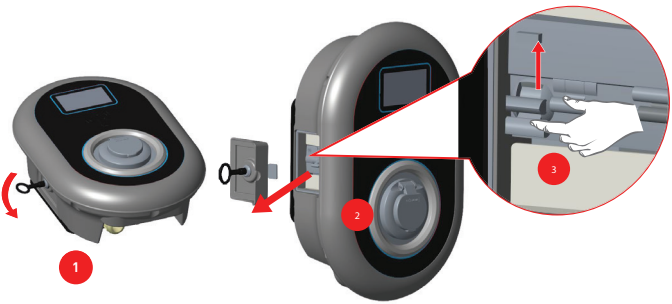


Figure-27

You may access the residual current device by openin the lock which is placed on the side cover as shown in the figure 27. Place and push triangle key on the side cover lock then rotate the key 90 degree counter-clockwise.

2.11 - RESETTING LOCAL RFID CARD LIST AND REGISTERING NEW MASTER RFID CARD IN STANDALONE USAGE MODE

If you loose your master RFID card and need to define a new master RFID card, below steps should be followed by your authorised service technician.

- Make sure the charging station is powered-off and open the front cover of your charger which is mentioned in installation guideline.
- Toggle the first position of dip switch which is on the smart card of the charger shown in figure 28. After that please turn on the charger again.

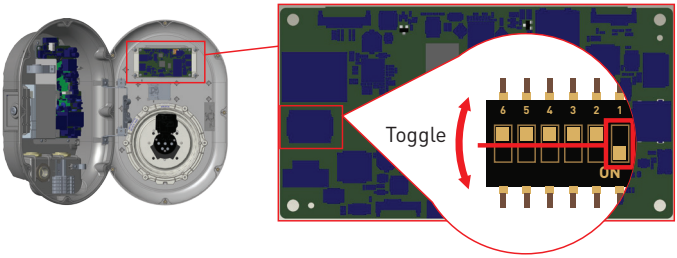


Figure.28

When the charger re-energised, please note that;

- Previously stored master card and user card list, if any exists, are deleted from charging station while entering the configuration mode.
- If master card had not been registered during 60 seconds then configuration mode expires and charging station behaves as autostart product.
- The first RFID card which is registered within this 60 seconds of duration will be the new master RFID card. Please follow instructions to register RFID user card which is used during charging process.

2.12 - SETTING ETHERNET PORT OF CHARGER TO STATIC IP IN STANDALONE USAGE MODE

If you need to set the Ethernet port of your charger to static IP, below steps should be followed:

- Make sure the charging station is powered-off and open the front cover of your charger which is mentioned in installation guideline.
- Toggle the second position of dip switch which is on the smart card of the charger shown in figure 29. After that please turn on the charger again.
- Charging station sets the Ethernet port to 192.168.0.10 adress statically and subnet mask will be set to 255.255.255.0

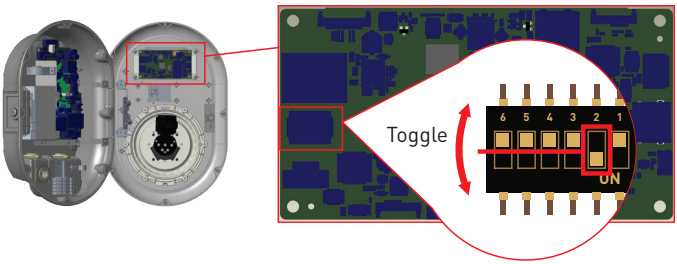


Figure.29

If the charger's Ethernet port is needed to be set in DHCP mode, this should be done from the webconfig interface.

2.13 - WEBCONFIG UI ENABLE / DISABLE

If you need to enable/disable the WebConfig UI below steps should be followed:

- Make sure the charging station is powered-off and open the front cover of your charger which is mentioned in installation guideline.
- If you want to enable the WebConfig UI, third position of dipswitch should be in "OFF" position as shown in figure 30.
- If you want to disable the WebConfig UI, third position of dipswitch should be in "ON" position as shown in figure 30.

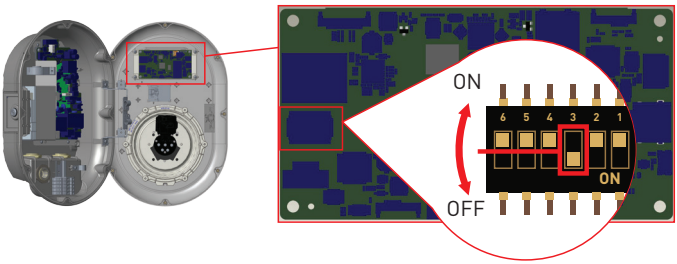


Figure.30

2.14 - ETHERNET DAISY-CHAIN CONNECTION (Optional)

Daisy-Chain is a wiring method of the devices in a network. It gives an opportunity to add/remove devices to/from network very easily. In order to make Daisy-Chain connection, an Ethernet hub board is used in EV Charger system. Basically it distributes all the Ethernet connection among the devices. Ethernet line cable coming from a device, a router or a hub needs to be connected to other device Daisy-Chain input port (CN5) as shown in Figure-31. Here, HMI Ethernet connection is made over CN6 port (Daisy-Chain HMI Out), and Daisy-Chain out connection is made over CN4. Internal Ethernet connection (Between HMI and Ethernet Hub Board) has been made during the production stage. So all is needed to make the connections of Daisy-Chain Input port and the Daisy-Chain Output port.

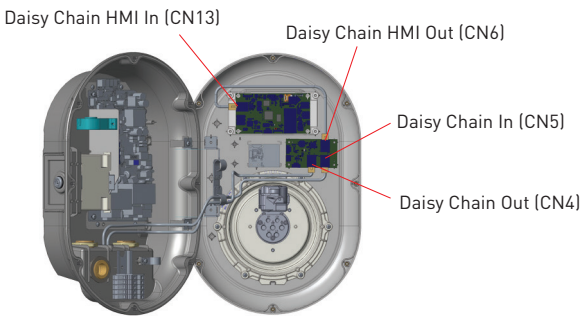


Figure-31 : EV Charger Internal Ethernet Daisy Chain Cable Connections

Daisy chain connection can be used to share internet access between the devices. For internet access sharing, a Daisy-Chain connection can be done as shown in Figure-32. Here, Ethernet router/switch/hub is used to route the traffic in the medium and any device can communicate with

the back-end server directly. Remote PC can be used to reach out “Web Config UI” of each device in the network without any need to make a direct connection to the devices.

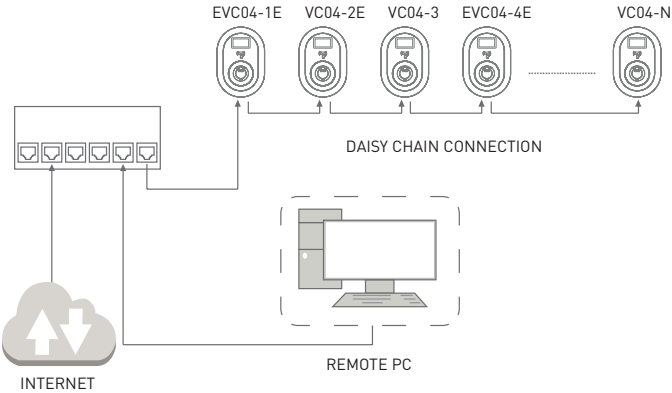


Figure-32: Daisy-Chain Connection based on Linear Topology

In linear topology, since devices are connected to each other in series, if one of them is switched off or has a power outage, the remained devices which are getting main network connection from this device will loss the connection with other devices. Thus, there will be two subnetworks if one of the devices has a connection problem.

3 - OCPP CONNECTION

Make sure the charging station is powered-off.

3.1 - CONNECT OCPP OVER CELLULAR NETWORK

Insert the Micro SIM card in the cellular module SIM card slot as shown in the below figure.

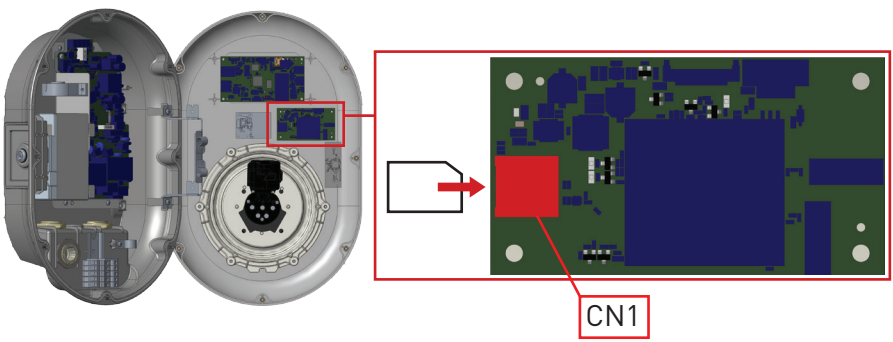
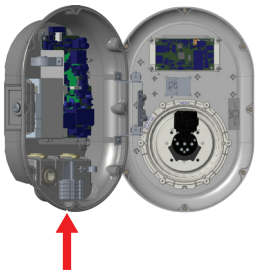


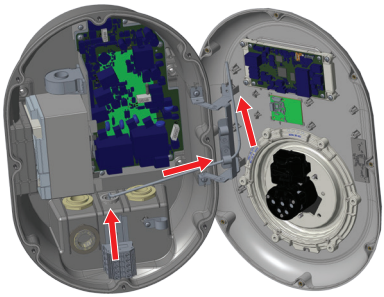
Figure-31

3.2 - CONNECT OCPP OVER ETHERNET

1- Insert cable through the cable gland. See section "2.6.1 Data Cable Connection" instructions, 1 and 2.



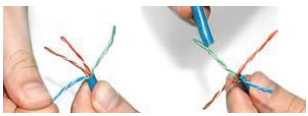
2- Pull the cable through the cable clamps as indicated by arrows in below figure.



3- Using a Crimping Tool, trim the end of the cable you're terminating, to ensure that the ends of the conducting wires are even.

4- Strip off approximately 1 inch of the cable's jacket, using a modular crimping tool or a UTP cable stripper.

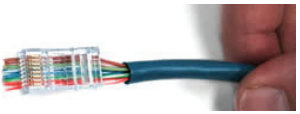
5- Separate the 4 twisted wire pairs from each other, and then unwind each pair, so that you end up with 8 individual wires.



6- Moving from left to right, arrange the wires in a flat, side-by-side ribbon formation, placing them in the following order: white/orange, solid orange, white/green, solid blue, white/blue, solid green, white/brown, solid brown.

7- Carefully insert the flattened, arranged wires into the connector, pushing through until the wire ends emerge from the pins.

8- Check to make sure that the wire ends coming out of the connector's pin side are in the correct order. If you realize that a mistake has been made in wire order after termination, you'll have to cut the connector off and start all over again!



9- Insert the prepared connector/cable assembly into the RJ45 slot in your crimping tool. Firmly squeeze the crimper's handles together until you can't go any further. Release the handles and repeat this step to ensure a proper crimp.

10- If your crimper doesn't automatically trim the wire ends upon termination, carefully cut wire ends to make them as flush with the connector's surface as possible. The closer the wire ends are trimmed, the better your final plug-in connection will be.

11- Termination is complete.

12- Insert the RJ45 connector to the socket as shown in figure below.

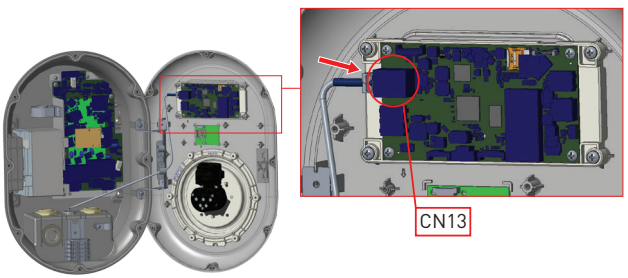


Table-17

4 - COMMISSIONING

You must connect your PC to the charging station to use functions and make configurations below:

- Login
- Change Password
- Main Page
- General Settings : Display Language, Display Backlight Settings, Led Dimming Settings, Display Theme, Display Service Contact Info, Logo Settings.
- Installation Settings : Earting System, Current Limiter Settings, Unbalanced Load Detection, External Enabled Input, Lockable Cable, Power Optimizer Total Current Limit.
- Ocpp Settings : Ocpp Connection,OCPP Version,Connection Settings,Ocpp Configuration Parameters
- Network Interface Settings:Cellular,Ethernet,Wi-Fi, Wi-Fi Hotspot.
- Standalone mode settings
- System Maintanence
- Log Files,Firmware Updates,Configuration BackUp&Restore,System Reset,Administration Password,Factory Default Configuration

4.1 - CONNECT PC TO THE SAME NETWORK WITH HMI BOARD

In order to access Web Config UI, first you need to connect your PC and EV charger to the same ethernet switch or connect EV charger to your PC directly.

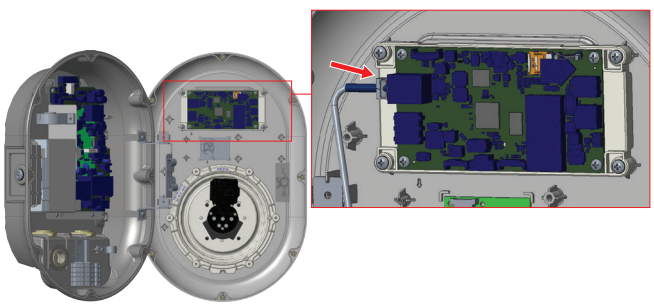


Figure.32

Default IP address of HMI board is 192.168.0.10. For this reason, you need to give static IP to your PC in the same network with HMI board.
You should assign static IP address to your PC in 192.168.0.254 network which means that IP address should be in a range of between 192.168.0.1 and 192.168.0.254.

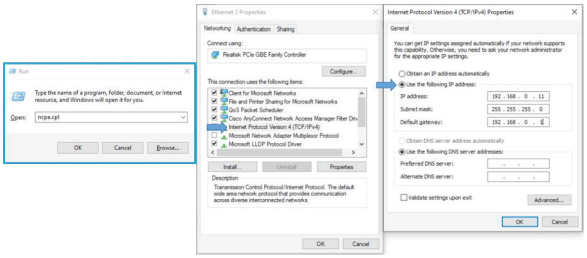


Figure.33

4.2 - OPEN WEB CONFIG UI WITH BROWSER

Open your Mozilla Firefox or Google Chrome web browser and type 192.168.0.10 which is IP address of HMI board.

You will see login page on your browser;

When the first time of the entering to Web Config or you never change your password, you will see the warning which is “We recommend you to change your default password

from system maintenance menu”.

You can enter the system with:

Default username = admin

Default password = admin

You can change password with Change Password Button in login page or Administration Password section in the System Maintanence tab.

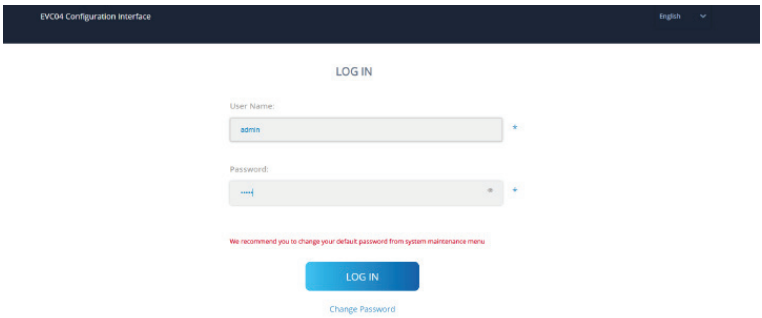


Figure.34

4.3 - CHANGE PASSWORD FOR LOGIN

If you click the “Change Password Button” you will be redirected to the Change Password page.

New password must contain at least 1 lowercase letter, 1 uppercase letter, 1 numeric character and minimum 6 characters.

After typing your current password and new password twice, you will be redirected to the login page again to log in with your new password.

All spaces you will see are mandatory in this page.

After submitting this page you will be redirected to login page. Also if you don't want to change the password you can turn back the login page with "Back To Login". Changing password is important for your security.

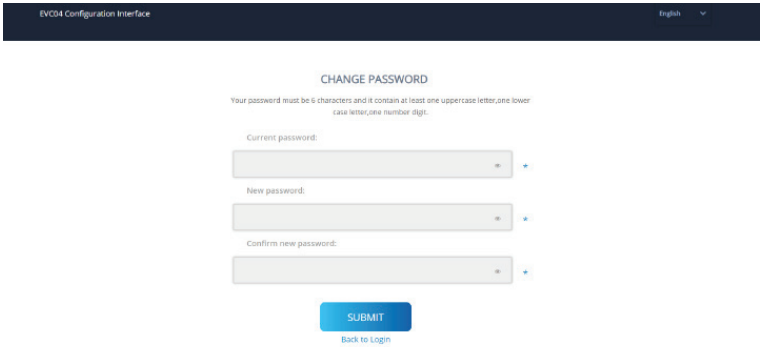


Figure.35

4.4 - MAIN PAGE

After the successfully login operation, you are directed to the main page.

Main page shows the general information about the device that are software versions,connection interface and ids

You can also change the language and log out of the web config with the buttons in the upper right corner of the page.

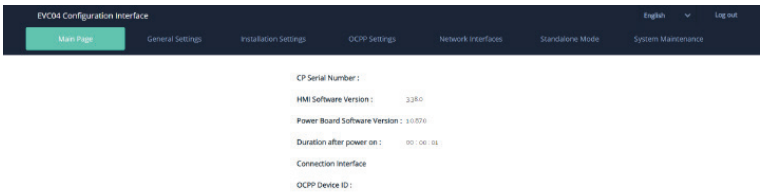


Figure.36

4.5 -CHANGE GENERAL SETTINGS OF THE DEVICE

4.5.1 - Display Language: Technician can select display language from the general settings page. Available languages for display language are as shown in figure below for now. After selecting the language, user can save selection by "Save Button".

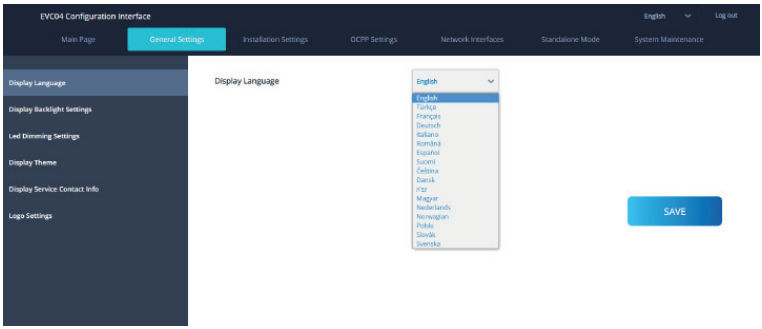


Figure.37

4.5.2 -Display Backlight Settings: Technician can adjust the brightness level of display by selecting the desired option in drop down menu. If technician selects backlight level as "Time Based", Sunrise and Sunset Time selections are shown and can be configured. "Sunrise Time" defines the transition time of low to high backlight level. Similary, "Sunset Time" defines the transition time of high to low backlight level. Sunrise and sunset time based configuration is periodic daily setting.

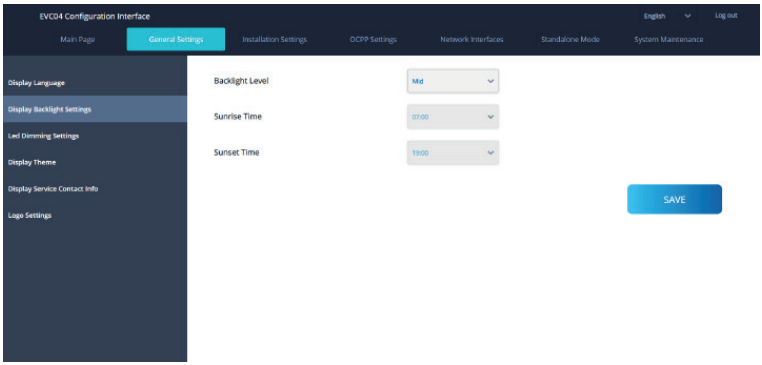


Figure.38

4.5.3 -Led Dimming Settings: Technician can adjust the brightness level of Led ring by selecting the desired option in drop down menu. If technician selects Led dimming level as "Time Based", Sunrise and Sunset Time selections are shown and can be configured. "Sunrise Time" defines the transition time of low to high backlight level. Similary, "Sunset Time" defines the transition time of high to low backlight level. Sunrise and sunset time based configuration is periodic daily setting.

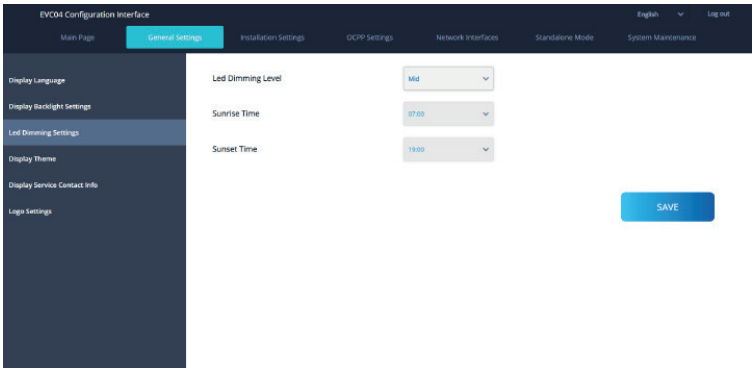


Figure.39

4.5.4 - Display Theme: Technician can adjust the theme of the display by selection desired option on drop-down menu.

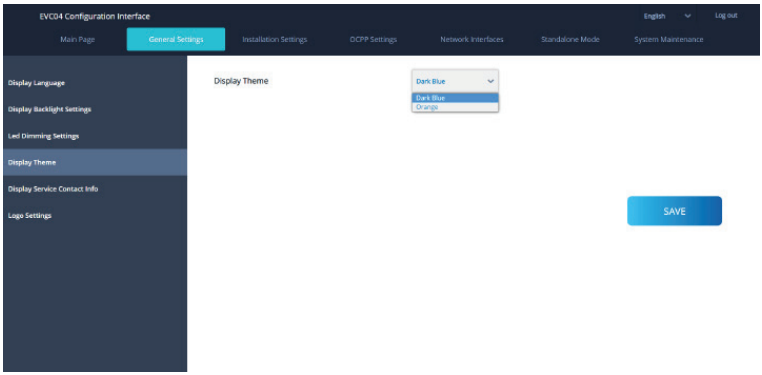


Figure.40

4.5.5 - Display Service Contact Info: Technician can enter the requested contact info of the service from this menu to be able to shown in display.

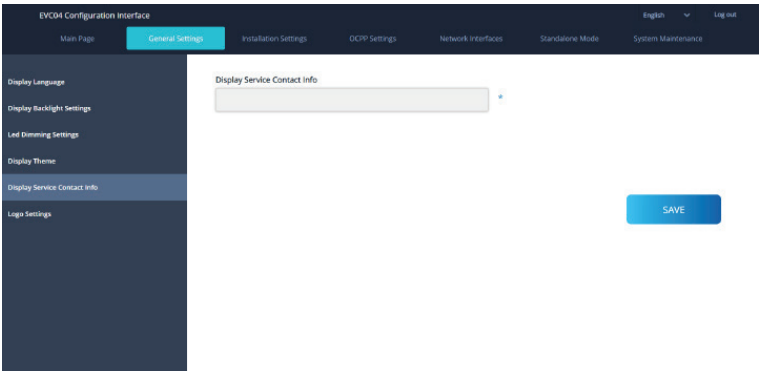


Figure.41

4.5.6 - Logo Settings: Technician can change the display logo of the station from the logo settings by uploading the required logo. The new logo should be in 80x80 pixels and .png format.

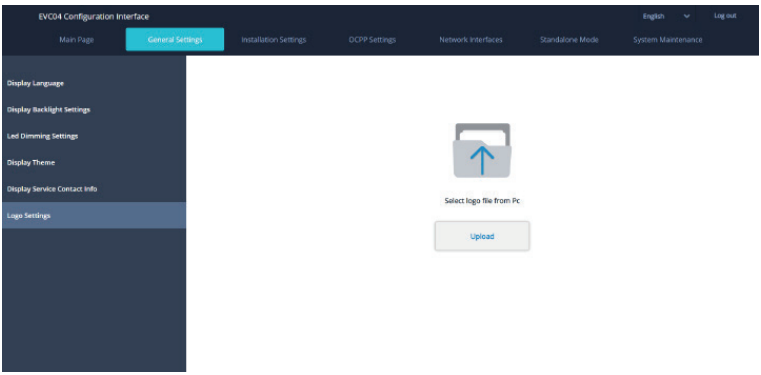


Figure.42

4.6 - INSTALLATION SETTINGS

4.6.1 - Earting system: Earthing System Tab in web configuration interface. If Earthing Type is selected as IT, the protective earth error check is disabled. In web configuration interface, earthing type is "TN/TT" by default.

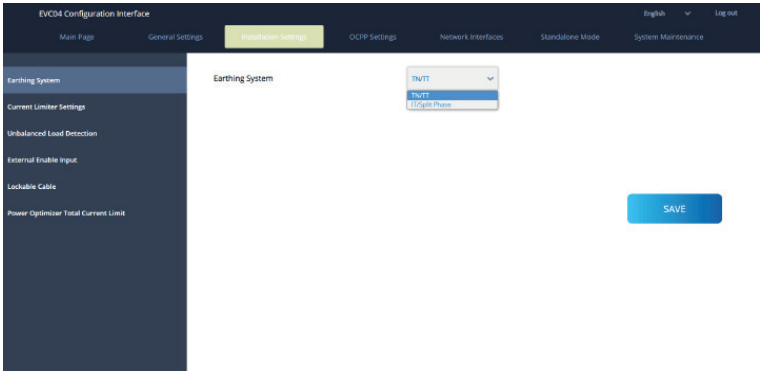


Figure.43

4.6.2 - Current Limiter Settings: Current Limiter Phase information can be adjusted in this menu. Also Current Limiter Value can be written manually between 6-32A. If a value below 6A is written, a warning will be shown to write minimum 6A.

Note: For example, if the charging station's current limiter is set to 16A in hardware and it is written and set 32A in web configuration interface, the station takes 16A.

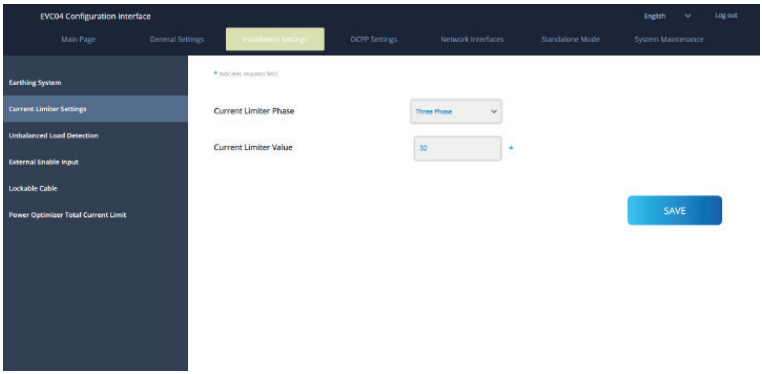


Figure.44

4.6.3 - Unbalanced Load Detection:

This feature is disabled in webconfiguration interface by default.

Unbalanced load detection function detects too much difference in power drawn between phases.

If any phase draws more than 4.6 kW of power (last one minute average) than the other phases,there is an unbalanced load. With this feature, this situation is detected and current limitation is made so that the phases does not exceed this limit value.

For example,

Phase 1 Power :3 kW,

Phase 2 Power :3 kW,

Phase 3 Power: 1 kW.

Power Limit for Phase1 or Phase2 will be 5,6 kW (1 kW + 4.6 kW)

If voltage is 230, current limit will be 5600/230 = 24A.

General Formula;

Power Limit = (Minimum Power + 4.6) (kW)

Current limit = Power Limit / Voltage (Amps)

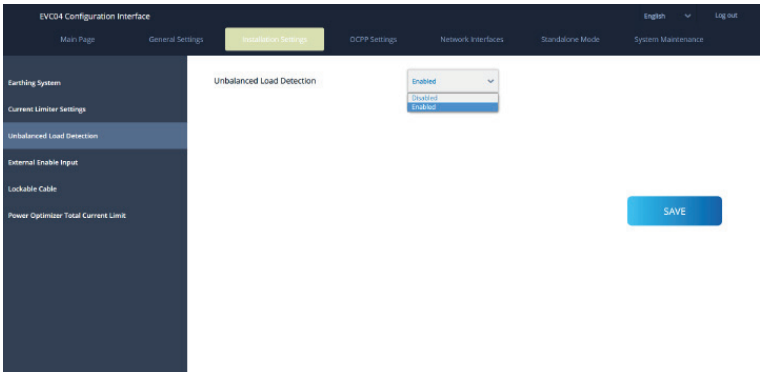


Figure.45

4.6.4 - External Enabled Input:

Default value for this option is set as disabled but if the user wants to use external enable input function, the setting should be set as “enabled”

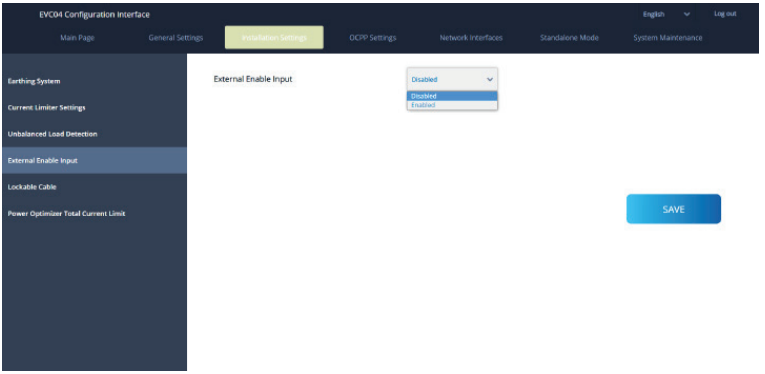


Figure.46

4.6.5 - Lockable Cable: This option is set "disabled" in web configuration user interface by default.

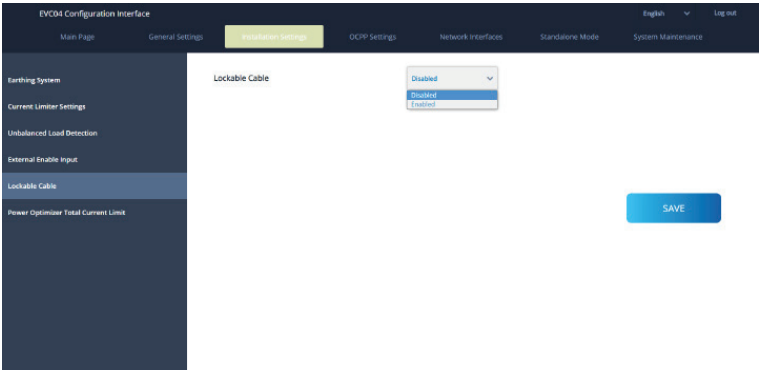


Figure.47

4.6.6 - Power Optimizer Total Current Limit: For Power Optimizer Total Current Limit, The value mentioned in section 2.6.4 can be set from web configuration interface as shown in figure below.

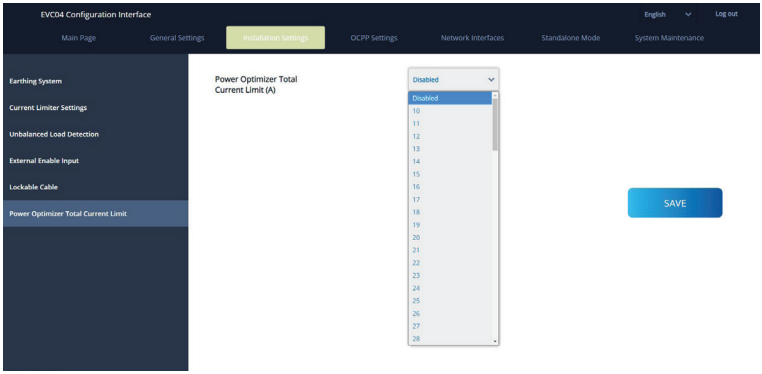


Figure.48

4.7 - CHANGE OCPP SETTINGS OF THE DEVICE

OCPP Connection

If you select mode as "Enabled"; you should type all fields in the connection settings and configuration parameters sections are enable in the below.

For now, the only available OCPP version is OCPP 1.6, so it will be selected as default.

The Central System Address and Charge Point Id are mandotary fields for saving this page.

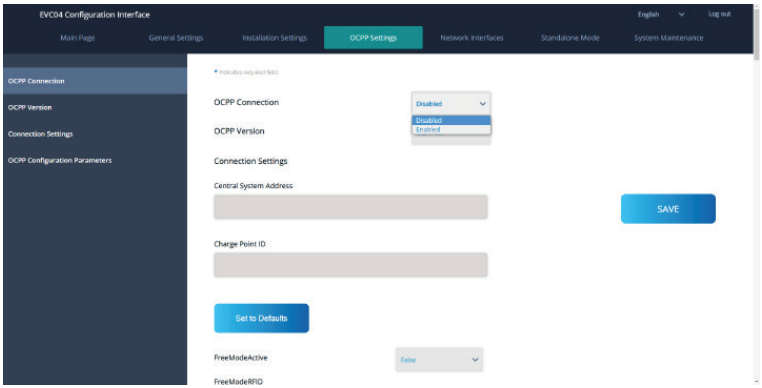


Figure.49

You can set OCPP configuration parameters to their default values by clicking "Set to Defaults" button.

You can select the OCPP settings type you want from the menu which is at the left side of the page. For example OCPP Connection,OCPP Version,Connection Settings and OCPP

Configuration Parameters.

Then, click "Save" button.

Please be careful for your entered values because the system does not accept the unsuitable values and gives the warning. In this case, values will not be saved. Then the page does not to be redirected the main page so you should check your values.

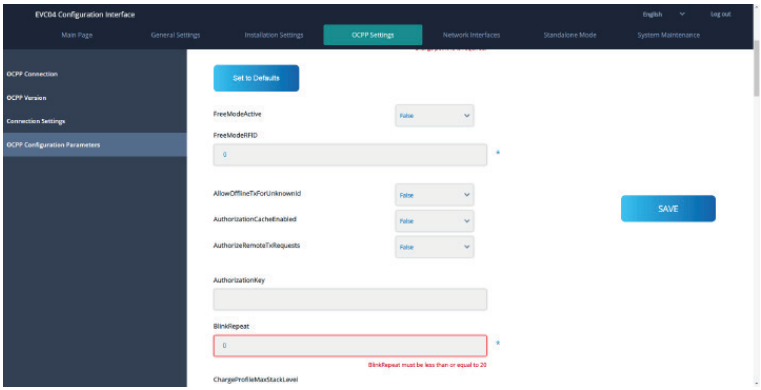


Figure.50

Also if you make changes and you don't save them before the leaving that page, you will see the warning as shown below.

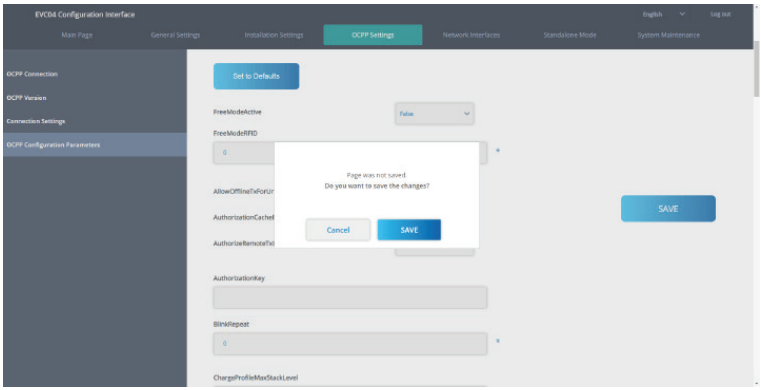


Figure.51

4.8 - CHANGE NETWORK INTERFACES SETTINGS OF THE DEVICE

There are three types of network interfaces in this page; Cellular, Ethernet, Wi-Fi and Wi-Fi Hotspot.

Select interfaces' modes as "Enabled" if you want to activate it.

If you select Ethernet or Wi-Fi IP Settings as "Static"; "IP Address", "Network Mask", Default Gateway" and "Primary DNS" spaces are mandatory.

If you set Wi-Fi as enabled, "SSID", "Password" and "Security" are mandatory.

You should fill all spaces in suitable formats.

CELLULAR

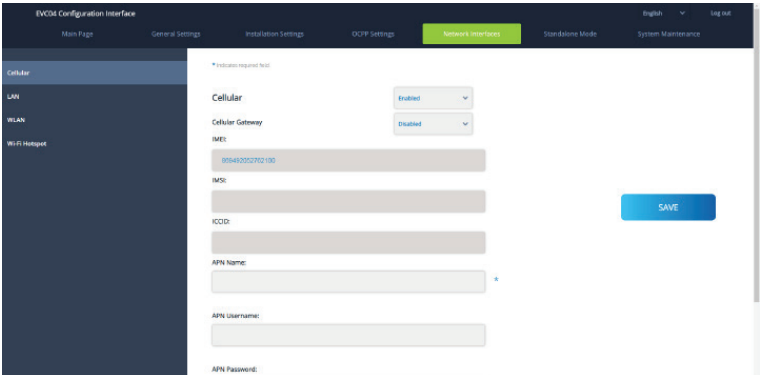


Figure.52

LAN

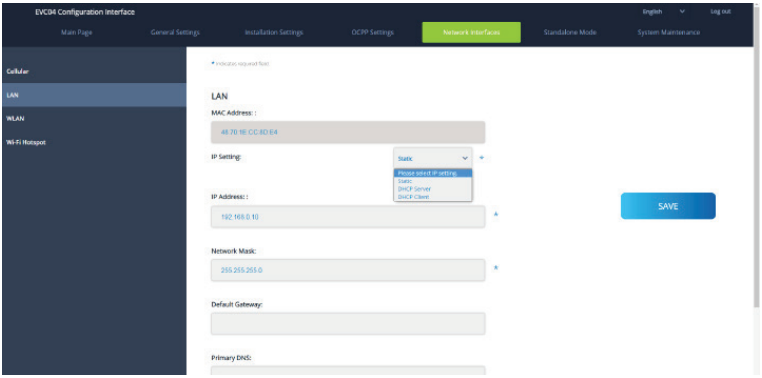


Figure.53

WLAN

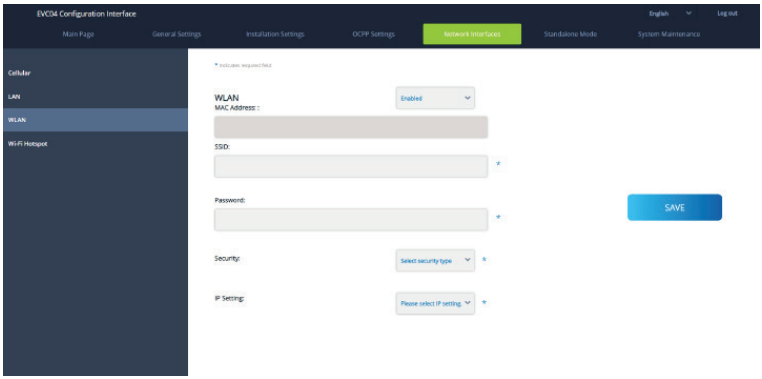


Figure.54

When you finish it, click "Save" button.

WIFI HOTSPOT

Details are described in section 4.3

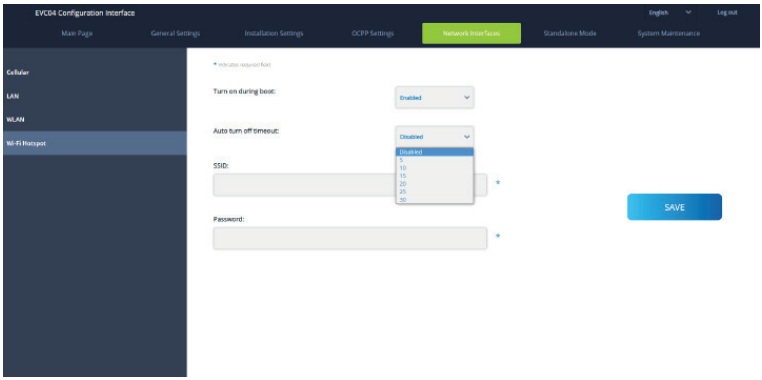


Figure.55

4.9 - CHANGE STANDALONE MODE SETTINGS OF THE DEVICE

If you have set OCPP as enabled in OCPP settings before, standalone mode cannot be selected. The mode list and "Save" button will be disabled in this situation.

Otherwise, you can select standalone mode from the list. There are three modes in the list;

Select "RFID Local List" mode to authenticate a RFID local list which will be entered by you. You can make an addition or deletion from the RFID local list later.

Select "Accept All RFID's" mode to authenticate all RFID's.

Select "Autostart" mode to allow charging without the need for authorization. It will be enough to plug to start charging.

If you are done with mode selection, click “Save” button and reboot the device.

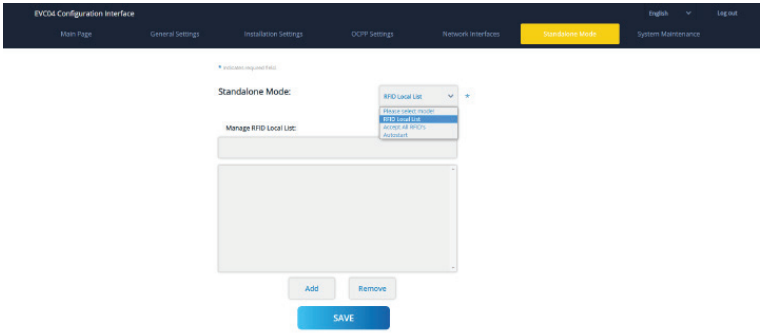


Figure.56

4.10 - MAKING SYSTEM MAINTANENCE OF THE DEVICE

In LOG FILES Page, you can download OCPP or HMI logs by clicking buttons.
Download log files will be shown after a few seconds.

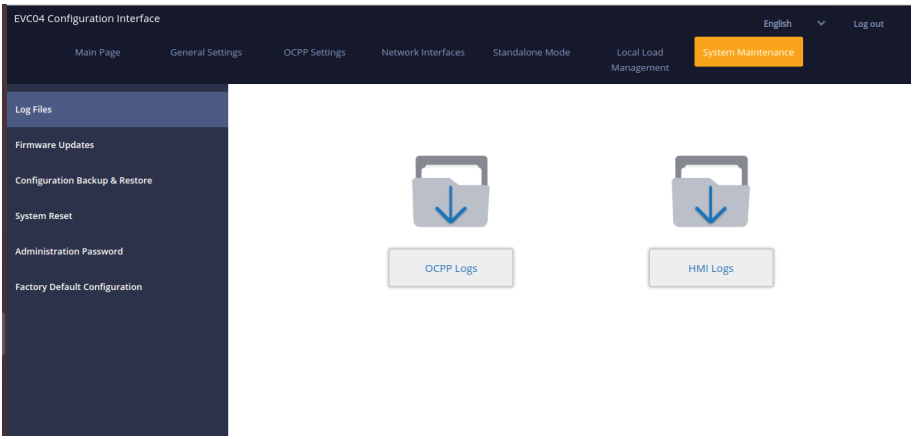


Figure.57

In FIRMWIRE UPDATE Page, you can upload the firmware update file from your PC by clicking "Upload" button.
After the file is uploaded, you can click "Update" button to start the firmware update.

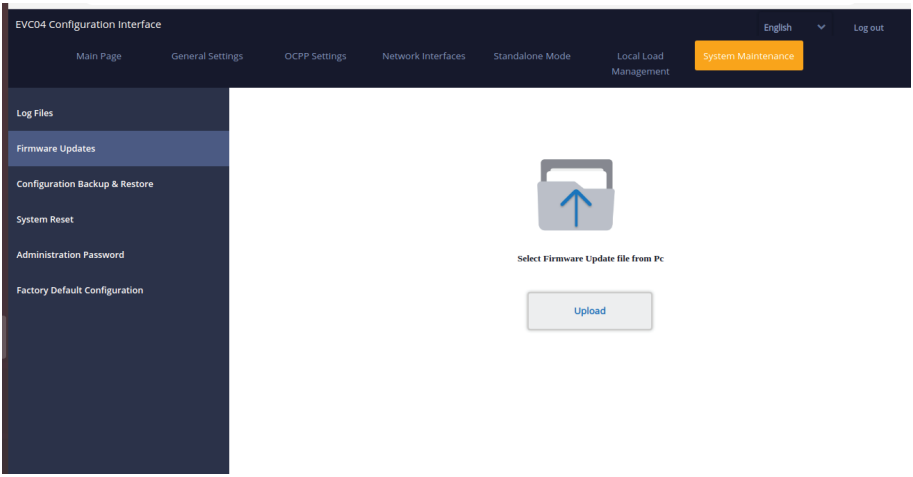


Figure.58

When update is started, your charger's LED indication will be seen as constant green. If your charger has display, you can see the firmware update screen in display. See to Firmware Uptade Screen Flow section.
After the firmware update is finished, your charger will restart automatically. You can see the latest firmware version of your charger from webconfig UI in main page.

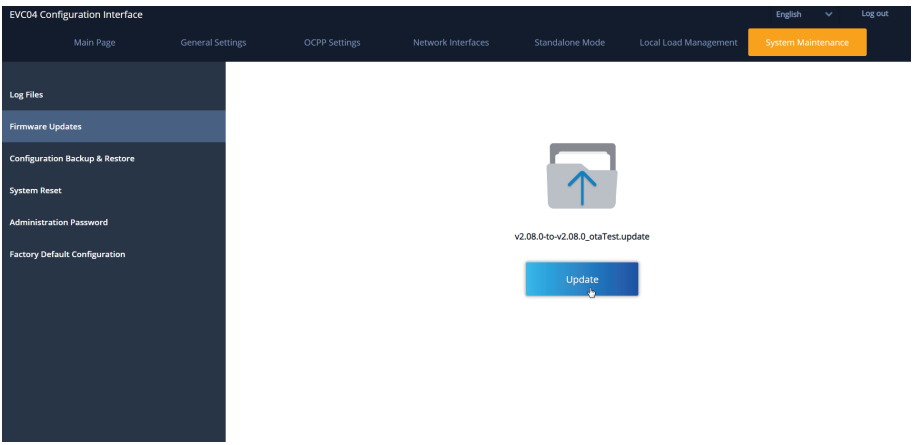


Figure.59

FIRMWARE UPDATE SCREEN FLOW (With Display Models)

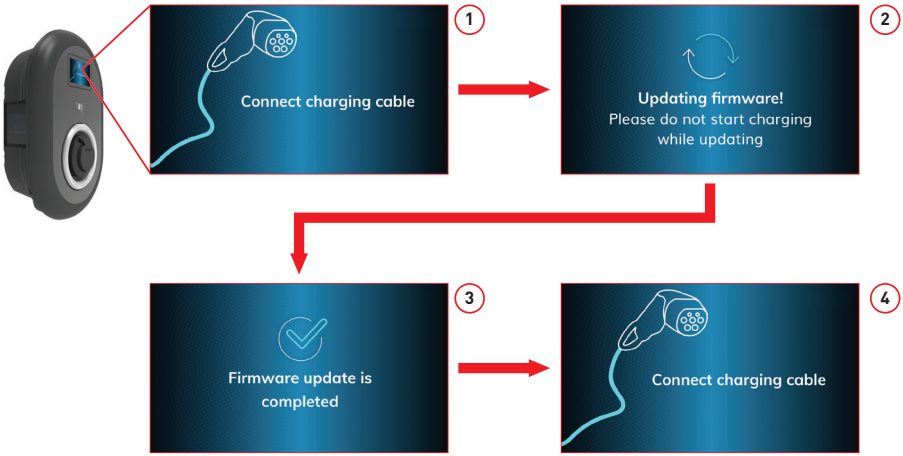


Figure.60

1- Firmware update is sent and devices uploads it.
2- When devices software is in updating status.
3- After 5 second screen turns back to opening screen.
4- Connect charging cable.

In CONFIGURATION AND BACKUP Page, you can backup of the sytem. If you want to restore you can click the Restore Config File button and upload the backup file. The system only accepts the .bak files.

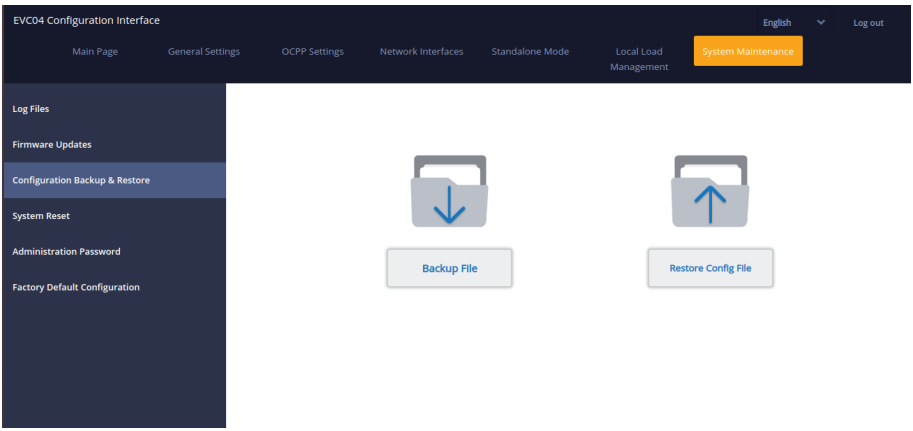


Figure.61

In SYSTEM RESET Page, you can make Soft Reset and Hard Reset by clicking the buttons.

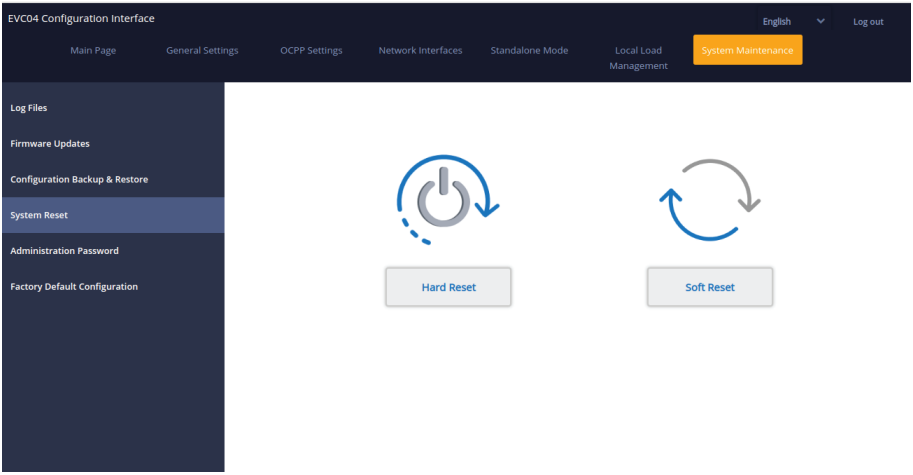


Figure.62

In ADMINISTRATION PASSWORD Page, you can change the web config's login password.
New password must contain at least 1 lowercase letter, 1 uppercase letter, 1 numeric character and minimum 6 characters.
All spaces are mandatory.

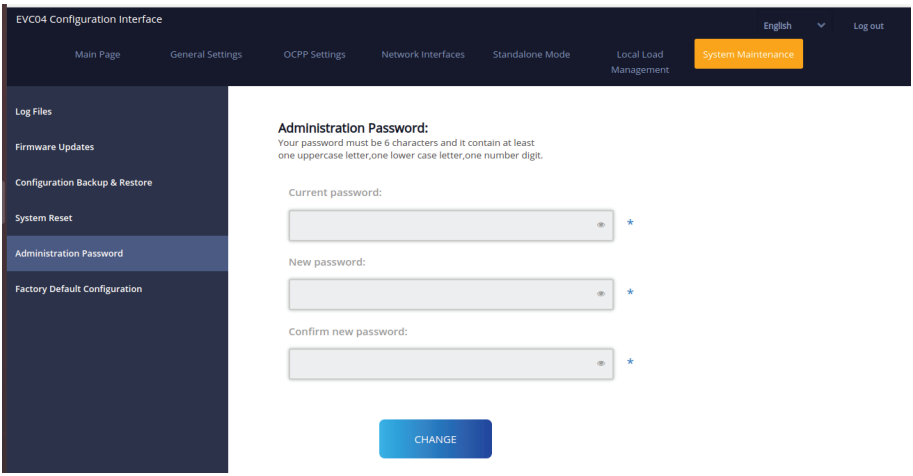


Figure.63

In FACTORY DEFAULT CONFIGURATION Page you can make factory reset to the device.

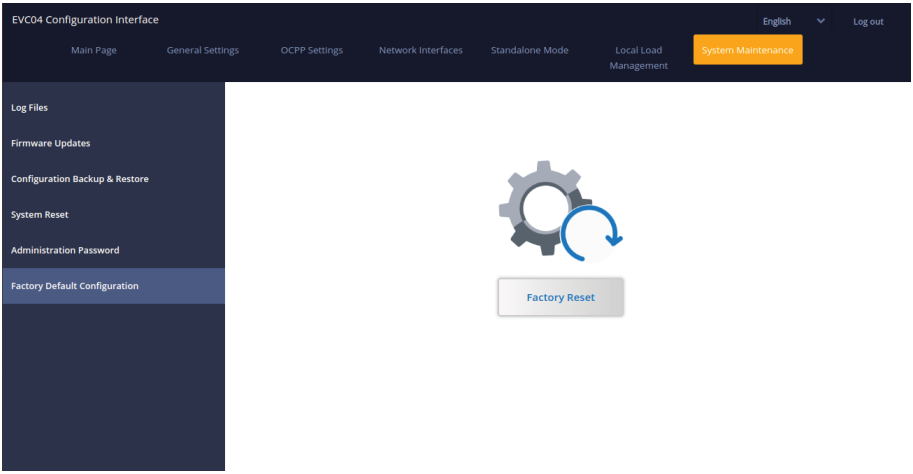


Figure.64

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