EV Hub

Electric Vehicle Charging Solutions

EVBOX

BusinessLine

Installation Manual

Nov 2021

Contents

1 Installation Test Results

To be completed before livening, and before cover put on:

Single or Three Phase:	☐ **Single**		☐ **Three**	
Maximum available current for charging stations (A):				
Ground Resistance (loop value, maximum ohms) (Ω) *(note)***:**				
Insulation Resistance (no greater than 1M ohm):	**L1-E**		**L3-E**	
	L2-E		**N-E**	
Upstream RCD Protection Device Type *(note)***:**	**Type A** ☐	**Type A-EV** ☐	**Type B** ☐	
Upstream MCB Protection Device and Location:				
Cable Cross Section (mm²):				
Visual Check –Polarity. All colour codes are correct and that none of them have been transposed. Watch for European colour variances – i.e., Phases are L1-Brown, L2-Black, and L3-Grey. Neutral is Blue.				
Visual Check - secure fixing, wire terminations, no signs of heat or water ingress (if annual inspection):				

Notes:

- *Ground resistance should be no more than 167 Ohm.*
- *The residual current device must switch off all phases connected and the Neutral.*

1.1 Installation – Hub Satellite only

To be completed only if Hub Satellite set up used. Before livening, and before covers:

Cable used for RS485 connection *(note)***:**	
Cable shield connected between all stations and grounded in the last station:	
Check if termination resistor is installed:	

Notes:

- *Recommended cable is CAT 5shielded Twisted Pair cable or better.*

1.2 Installation Test Results

To be completed once livened, before you put the cover on, and before connecting to the backend software:

Voltages between phases and neutral and between neutral and earth. (V)	**L1-N**		**L3-N**	
	L2-N		**E-N**	
Manual RCD Trip Test:				

1.3 Operational Test Results

To be completed once the cover and cable is fitted, unit is livened, and **before** you have connected it to the backend software:

Check any cover seal is correctly inserted:	
Check cover is correctly positioned for IP54 rating:	
The LED ring around the socket or lead exit displays the	• **RED (Blinking) – Starting up and trying to connect to the network;** • **GREEN or OFF – Stand-by or ready for use;**

following colour indication after power on:	

If you have a Test Equipment, such as the Metrel MI 3155XD and A1532 or A 1632, or a vehicle for the third Test:

RCD Trip Test:	•
Earth Continuity:	•
Test correct procedure:	• **GREEN – Standby, ready to be used** • **GREEN – (Blinking) – Verification & connection to car** • **Yellow – Waiting for car to authorise charging** • **BLUE - Charging**

Note: Test Equipment can only be used on the Charging Station in Autostart mode.

1.4 Connection to Backend Software Checklist

To be completed livened, and with covers on:

Wi-Fi Name & password, if connected *(note)***:**	
Charge Current max setting:	
Management System is set to 'SaasCharge Int':	
'Set Charger to online' is on:	
All changed settings have been Saved and the Station has been Rebooted:	

Note: If the 4G signal is strong at the Charging Station location, then you don't need to connect to the Wi-Fi as well.

2 Tools Required

- Phillips Screwdriver (size 2) - long
- Ball Hex Key 5mm – short
- Small socket set with 5mm hex ball fitting – Makes putting the covers so much easier.
- Small 6-inch Adjustable Spanner – if fitting a Double Unit on a Combi Pole
- Hammer Drill – if fixing to cement or block wall
- M8 Masonry Bit
- Lite Hammer
- EVBox Connect App
    - Commissioning Sheet with Charger Registration #, Serial Code and URL
- Smart Charge App

3 Getting Started - Unpack

Unpack the Unit from the packaging. Make sure that you have received:

1	EVBox BusinessLine Charging Unit • With additional 4mm Earth connection lead from L/H Earth Stud to R/H top fixing hole • EVBox Connector set (for hub-satellite installations, supplied with each satellite). 120 Ω resistor (to terminate the RS485 connector of last satellite charging station in a hub-satellite installation)	☐
2	EVBox BusinessLine Cover o With Smart Charge Labels o With 2 x M6 Cap Screws and Ball Hex Key 5mm	☐
3	EVBox BusinessLine User Manual	☐
4	EVBox BusinessLine Installation Manual	☐
5	Smart Charge – EV Parking Sign o With 2 x M8 35mm Wall Anchors @ 2 x 35mm White Capped Screws	☐

For Mounting Options:

1	Single – Wall Mount: o BusinessLine Backing Box o 6 x Hole Grommets – 3 on each side o M8 Bolt and Wingnut in the centre o M5 20mm Bolt at the bottom o 2 x M5 25mm & Flat Washer for top o Optional: Weather Sealing Strips (4 x 592mm long & 4 x 84mm long) – for non-sheltered applications	☐
2	Single – Combi Pole Mount: • Combi pole, 1400 mm, ON the ground • Plastic Cap for the top of the Pole • BL Combi Pole Mounting Box o M8 Bolt and Wingnut in the centre	☐

	○ M5 20mm Bolt at the bottom ○ 2 x M5 25mm & Flat Washer for top	
3	Single – Unistrut Mount: • BL Unistrut Mounting Plate ○ M8 Bolt and Wingnut in the centre ○ M5 20mm Bolt at the bottom 2 x M5 25mm & Flat Washer for top	☐
4	Double – Combi Pole Mount: • Combi pole, 1400 mm, ON the ground	☐

4 Introduction

This Installation manual tells you how to install and fault find any potential issues with the EVBox BusinessLine. Carefully read the safety information before you start.

These instructions are valid for several models of the charging station. It is possible that some features and options described may not apply to your charging station.

4.1 Compatibility

Note that the EVBox BusinessLine generation 4 is not compatible with earlier generations of the BusinessLine charging station. Each Hub-Satellite installation must consist of the same generation of charging stations.

4.2 Get in touch

If you have any suggestions how we can improve our offer, or if you see an error, we'd love to hear from you. You can contact us by going to https://ev-hub.com.au/

All EVBox manuals can be downloaded from evbox.com/manuals.

4.3 Product classification

This product has the following classification:

Table 1. Classification

Power supply input	EV supply equipment permanently connected to AC supply network.
Power supply output	AC EV supply equipment
Normal environmental conditions	Outdoor use
Access	Equipment for locations with unrestricted access.
Mounting method	Stationary equipment, surface-mounted on walls, poles or brackets.
Protection against electric shock	Class 1 equipment
Charging modes	Mode 3

5 Installation Requirements

5.1 What is Required?

For a Qualified and Licensed Electrician to perform an installation, that complies with the applicable regulations, they will need to:

- Check the capacity of the supply to the property. If close to capacity, consider the use of a Main Switch MCB.
- Run out an appropriately sized dedicated circuit that is to be a single run back to the board with NO other connections.
- Install an Isolator is to be located near to the unit and labelled.
- Install a suitable over current protection for the EV Charger circuit.
- Install a dedicated RCD to be fitted to the circuit - See notes below.
- Ensure that the output socket or cable of the EV Charger is installed at a minimum height of 800mm from the floor or ground.
- Ensure that the Socket or fixed cable to be as close to the vehicle as practicably possible.

5.2 MCB installation

If you are installing a Mode 3 charger that brings the property close to the rated current of the street protection device (pole fuse etc.) consider replacing the Main Switch with a Main Switch MCB. This will offer additional protection and if mains overcurrent occurs the likelihood is that the building owner can reset this device over calling out the local power authority to replace the street protection device.

5.3 RCD installation

All RCD types continuously monitor the line and neutral AC currents which under normal conditions should be equal and opposite in direction of flow i.e., flowing from the line supply conductor through the load and returning via the neutral conductor. In the event of a fault causing current to flow via the earth then this creates an imbalance of currents between the line and neutral conductor currents causing the RCD to trip and isolate the supply from both line and neutral conductors.

RCDs with a Tripping point of 30mA and an operating time of 40ms when the earth current equals 150mA, are defined in the Standards as a means of 'additional protection' in the event of a person coming into contact with a live conductor.

In Australia and New Zealand, it is a requirement to install an RCD upstream from the EV charger (at the main supply or distribution board), even if the EV charger has an RCD built in. Part of the reason for this is that it will protect a person in the case that the supply is broken between the distribution board and the EV charger (for example a person cuts the supply cable with a power tool).

5.4 Different Types of RCD protection:

Residual current devices are classified as Type A and Type B and operate as follows:

- Type A: Ensures tripping for residual AC currents and pulsating DC. currents,
- Type B: Ensures tripping for residual AC currents, pulsating DC currents and smooth DC currents.

5.5 Smooth DC Currents

The charging circuitry in the power electronics of a modern EV has the potential to introduce harmonics or 'smooth DC residual currents' while charging. This DC residual current could potentially 'blind' a standard Type A RCD, rendering it incapable of responding to a situation in which there is a genuine electric shock risk.

5.6 Standards Requirements:

The latest IEC standard for Mode 3 electric vehicle charging stations (IEC 61851-1:2017) section 8.5 refers to EV supply equipment requiring either:

- RCD Type B or;
- A Type A RCD and appropriate equipment that ensures the disconnection of the supply in case of DC fault current above 6mA.

6 AS/NZS 3000:2018 – Electrical Installations "Wiring Rules"

6.1 Appendix P: Page 568

- **Mode 3:** Permanently connected to AC Mains utilizing dedicated EV Supply Equipment, with a Control Pilot function.
- **Dedicated Circuit:** Each Charger outlet must be its own dedicated circuit.
- **RCD Protection:** IEC 62955 - Socket Outlet or Vehicle Connector complying with IEC 62196, must have either A, RCD Type B, or B, RCD Type A and appropriate equipment that ensures disconnection of the supply in case of DC fault current above 6mA.
- **Overcurrent Protection:** Each Charger should be supplied individually by an overcurrent protective device complying with AS/NZS 60898, AS/NZS 61009 or AS/NZS 60947 series.
- **General:** Each connecting point should be provided with one socket outlet or vehicle connector complying with either IEC 62196-1 or IEC 62196-3.
- **Minimum Height:** 800mm from ground.

6.2 Clause 2.3.2.2.1

- **Isolating Switch:** With a minimum current rating 32A, shall be provided for the final sub circuit adjacent to the charging facility.

6.3 P1.3 - Testing:

- AS/NZS 61439 series for test and related requirements for low voltage switchgear and control gear assemblies.
- IEC 62196 series for vehicle coupler, plug and socket outlet.

6.4 Periodic Inspection:

- Publicly available EV Charging Stations should be inspected at least once per week, in order to verify that there is no visible damage or operational fault.
- Publicly available EV Charging Stations should be inspected at least once per year to verify correct operation.

7 Safety precautions

Read and obey the following safety precautions before you install, service or use your charging station. The installer must ensure that the charging station is installed in accordance with the relevant country-specific standards and local regulations.

7.1 Warning: Risk of electric shock

- Switch off input power to your charging station before you install or service the charging station. Keep the power off until the charging station is fully installed with its covers installed and secured.
- In the event of danger and/or an accident, a certified electrician must immediately disconnect the electrical supply from the charging station.
- Do not operate the charging station if it is physically damaged or if the charging cable has cracks, excessive wear, or other visible damage. Contact EVBox or your distributor if you suspect that the charging station is damaged.
- Do not direct powerful jets of water toward or onto the charging station. Never operate it with wet hands. Do not put the EV charging plug into any liquid.
- Do not put fingers or other objects inside the charging port or plug port.
- Read the user instructions delivered with your EVBox charging station and the User Manual for your electric vehicle before charging your vehicle.

7.2 Warning: Accumulation of gasses

- Some electric vehicles require an external ventilation system to prevent the accumulation of hazardous or explosive gasses when charging indoors. Refer to your vehicle User Manual to check if your vehicle releases hazardous or explosive gasses when charging.

7.3 Cautions:

- Use this charging station to charge Mode 3 compatible electric vehicles only. Refer to your vehicle User Manual to check if your vehicle is compatible.
- This charging station may affect implanted electronic medical devices. Before you charge your vehicle, consult the supplier of the electronic medical device to determine if it can be influenced by charging effects.
- This charging station may only be installed, serviced, relocated and repaired by qualified persons. Incorrect installation, repairs or modification can result in danger to the user and may void the warranty and liability.
- This charging station contains no user-serviceable parts. The user must not attempt to service, repair or relocate the charging station. Contact EVBox or your dealer for more information.
- Make sure that the charging cable cannot become damaged (kinked, jammed or driven over) and that the plug(s) do not come into contact with heat sources, dirt or water.
- Only use the charging station under the specified operating conditions.
- Do not use explosives or flammable substances near the charging station.
- If you are unsure about how to use a charging station, ask for help.
- Do not allow children to operate a charging station. Adult supervision is required when children are near a charging station that is in use.
- Make sure that the charging cable is positioned so that it will not be stepped on, tripped over, driven over or otherwise subjected to excessive force or damage.

- While charging, the cable must be completely unwound and connected to the vehicle without overlapping loops (this is to avoid the risk of the charging cable overheating).
- Only pull on the charging plug hand grip and never on the charging cable itself.
- Adapters, conversion adapters or cord extensions must never be used on this charging station.

7.4 Transport and storage

- Disconnect input power before removing the charging station for storage or relocation.
- Only transport and store the charging station in its original packaging. No liability can be accepted for damage incurred when the product is transported in non-standard packaging.
- Store the charging station in a dry environment in the temperature range given in the specifications.

8 Product features

The BusinessLine charging station is compatible with all Mode 3 electric vehicles and is designed for both indoor and outdoor use. Operation of the charging station is approved at ambient temperatures of between -25 °C and +50 °C. The charging station can be connected to a central system for the registration of the number of kilowatt-hours (kWh) charged.

8.1 BusinessLine configurations

BusinessLine charging stations come in the following configurations:

- Single socket, communications hub.
- Single socket, satellite.
- Double socket, one communications hub and one satellite.
- Double socket, two satellites.

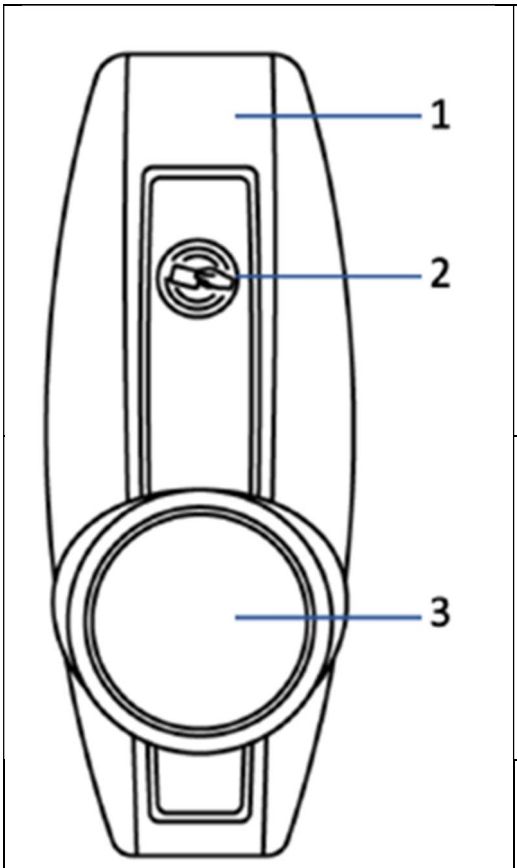
One BusinessLine hub can be connected to a maximum of 19 BusinessLine satellites. A smart grid can be established over all charging stations. This optimizes power usage and lets more vehicles charge simultaneously should power limitations exist.

8.2 Connecting BusinessLine

A charging station has an RFID card reader and a kWh meter. A communications hub is built into a hub-type charging station. The communications hub has a cellular data connection, Wi-Fi, Bluetooth and GPS which have the following functions:

Connection	Description
Cellular data connection (2G, 3G and 4G)	Connection to backend systems for setup, maintenance and transactions (method 1).
Wi-Fi	Connection to backend systems for setup, maintenance and transactions (method 2).
Bluetooth	Local setup and access control for the charging stations.
GPS	Location of the charging stations.

8.3 Description



1. Operation

- BusinessLine is connected using either a built-in or remote dual band Wi-Fi connection or a cellular modem.
- To start or stop a charging session, use a registered RFID (Smart Charge) charge card, key fob, or the Smart Charge app.
- When used in Autostart mode, a registered charge card, key fob, or Smart Charge app is not required. Charging starts automatically when the charging station is connected to a vehicle.

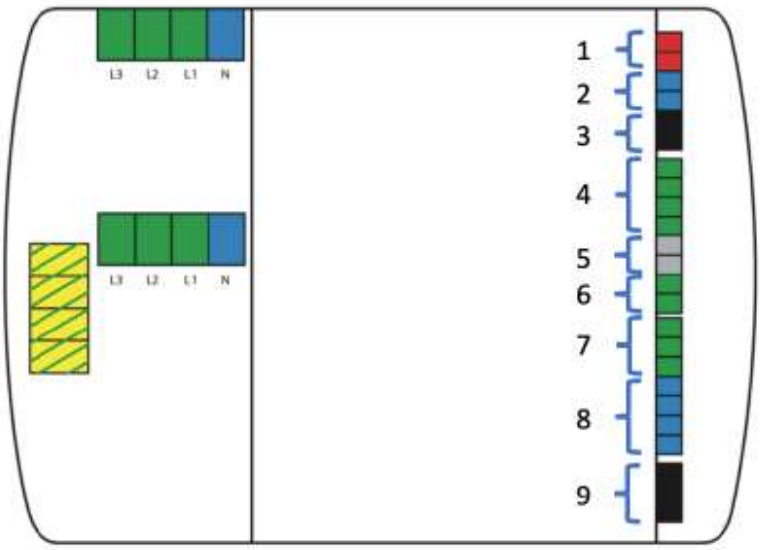
2. RFID reader

- This is the area where you scan an RFID card or key fob.
- The BusinessLine reads the data from the card or fob to start or stop a charging session. If the charging station is not connected to a vehicle and is not activated by the RFID card or fob, there is no voltage on the socket and the charging session will not start.

3. LED indicator ring and socket

- The LED indicator ring around the socket shows the status and mode of the charging station at all times. The socket lets you use your own charging cable. The socket is a standard Type 2 with an optionally integrated shutter system.

8.4 Controller Connections



Connection group	Description
1 - 2 pin, red	External relay
2 - 2 pin, blue	kWh meter
3 - 2 pin, black	RS485 hub-satellite communication
4 - 4 pin, green	Inputs
5 - 2 pin, gray	RS485 smart charging communication
6 - 2 pin, green	Temperature sensor
7 - 3 pin, green	Pilot
8 - 4 pin, blue	LED ring
9 - 3 pin, black	Lock motor

9 Technical specifications

Feature	Description
Technical features	
Charging capacity per socket	Maximum 7.4 kW, 11 kW or 22 kW, depending on installation and set-up.
Socket type	Type 2
Number of sockets	1 or 2
Output power per socket	1-phase or 3-phase, 230 V – 400 V, 16 A or 32 A.
Connection capacity	1-phase or 3-phase, 50 Hz, between 2.5 – 10 mm2
Residual direct current detecting device	Complies with IEC 62955, with 6 mA smooth residual DC detection and additional 30 mA residual AC detection
Operating temperature range	-25 °C to +50 °C
Humidity (non-regulating)	Max. 95%
Communication	GPS / GSM / UMTS / LTE cellular data, Wi-Fi, Bluetooth and GPS module controller with RFID reader (in hub type)
Communication protocol	OCPP 1.6 JSON
Physical features	
Certification and compliance	See Declaration of conformity
Protection	IP55, IK08
Housing	Polycarbonate
Max. installation altitude	2000 m above sea level

Feature	Description
Dimensions (mm)	600 x 255 x 410 mm (double) 600 x 255 x 205 mm (single)
Weight (kg)	12 kg (double socket) 10 kg (single socket)

Mounting	Double: Combi pole in or on the ground, or on a wall. Single: Combi pole in or on the ground, or on a wall. Wall spacer for direct installation on a wall.
Standard colours	RAL 7016 (dark gray), RAL 9016 (white), RAL 5017 (blue)

10Prepare for installation

The following recommendations are a guide to help you prepare for the installation of the EVBox BusinessLine charging station.

10.1 Safety precautions

You must read and obey the safety precautions on page 7 at the beginning of this manual before you install, service or use your EVBox charging station. The installer must ensure that the charging station is installed in accordance with the relevant country-specific standards and local regulations.

10.2 Plan installation

- Calculate the existing electrical load to find the maximum operating current for the charging station installation.
- Calculate the distance from the power supply panel to the charging station installation to find the voltage drop. Local regulations may be applicable and can vary depending upon the region or country.
- Obtain all necessary permits from the local authority that has jurisdiction.
- Use only copper conductors.
- Refer to local wiring regulations to select the conductor sizes.
- Make sure that there is adequate free space of at least 20 cm around the charging station for ventilation purposes.
- Use the correct tools and provide sufficient material resources and protection measures.
- Make sure that there is good cellular and/or Wi-Fi reception where the hub charging station will be installed.
- Prepare the installation areas with the correct power wiring for each charging station and the data cabling between the satellite charging stations and the hub charging station.

10.3 Choose location

Position the charging station, where possible, in surroundings where it is not exposed to extreme sunlight and vulnerable to external damage.

10.4 Hub-Satellite installations

A Hub-Satellite charging station installation can consist of up to 19 satellite stations connected to a hub station. A Hub-Satellite installation is easier and more economical to manage than individual hubs because it has only one hub, and it enables a smart grid to be established across the connected stations which optimizes power usage.

Data communication between the stations uses a RS485 serial data connection.

For more information see chapter Configure Hub-Satellite on page 21.

10.5 Route power supply cables

The appropriate wire gauge of the supply cable depends on the power rating and distance between the meter cabinet and the charging station. The voltage drop must not exceed 5% (it is advisable to have a maximum allowable voltage drop of 3%). The maximum wire gauge that can be fitted is 10 mm2.

The double socket model can be supplied with connections for one or two power cables. The standard configuration is supply from one power cable to the terminals in the hub unit, with the satellite fed from these terminals using internal powerline wiring. To connect a power cable separately to each unit, remove this internal power wiring and connect the satellite unit power cable directly to the satellite RCBO.

Route the power supply cables to the position where the charging station will be installed. Make sure of the following:

- There must be enough cable for it to extend at least 50 cm out of an installed Combi pole or Wall Adapter.
- There must be enough cable for it to move sufficiently during installation of a Combi pole.

Note: The power line enters the station via the backplate for single stations, and through the Combi pole for double stations.

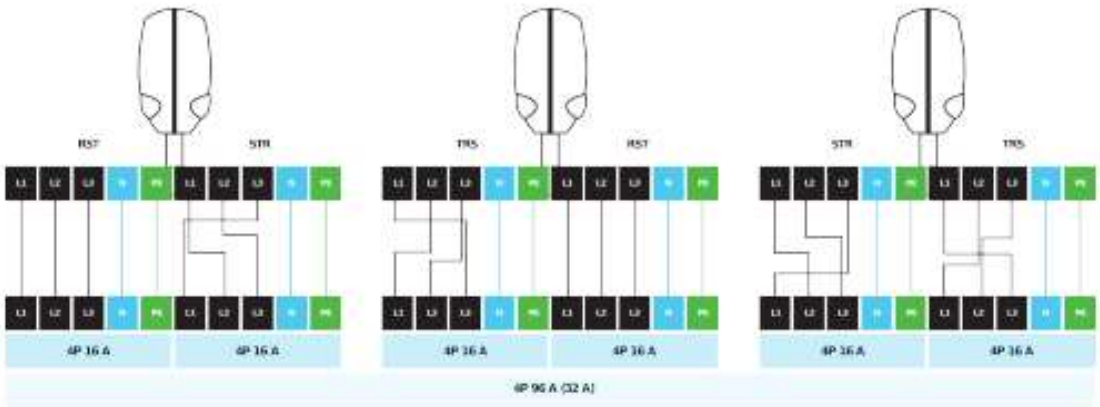
The maximum power rating for each connector is specified below.

Power per connector	Connection	Input Current	Output Current
7.4 kW	1-phase	2 x 32A	2 x 32A
11 kW	3-phase	1 x 32A or 2 x 16A	2 x 16A
22 kW	3-phase	2 x 32A	2 x 32A

10.6 Phase rotation

To avoid overloading the first phase with one-phase electric vehicles, we recommend rotating the phases as shown below.

Note: If phase rotation is used you must inform Smart Charge (support@smart-charge.com.au) so the support team can update the backend system data.



10.7 Power configuration for smart grid

For accurate performance of the smart grid, consult with Smart Charge (support@smart-charge.com.au) to set the maximum power available on the grid.

- If multiple three-phase satellite charging stations are connected in the smart grid, it is recommended to swap the primary phase to distribute power consumption as evenly as possible over all phases (see Phase rotation on page 13).
- Make sure that the connector number printed on the Mode 3 charge box and the phase it uses as its primary phase match.
- For optimal performance of the smart grid, you must inform your Smart Charge (support@smart-charge.com.au) of the configuration. Use the EVBox Connect app to set-up your BusinessLine ready for connection to a network.

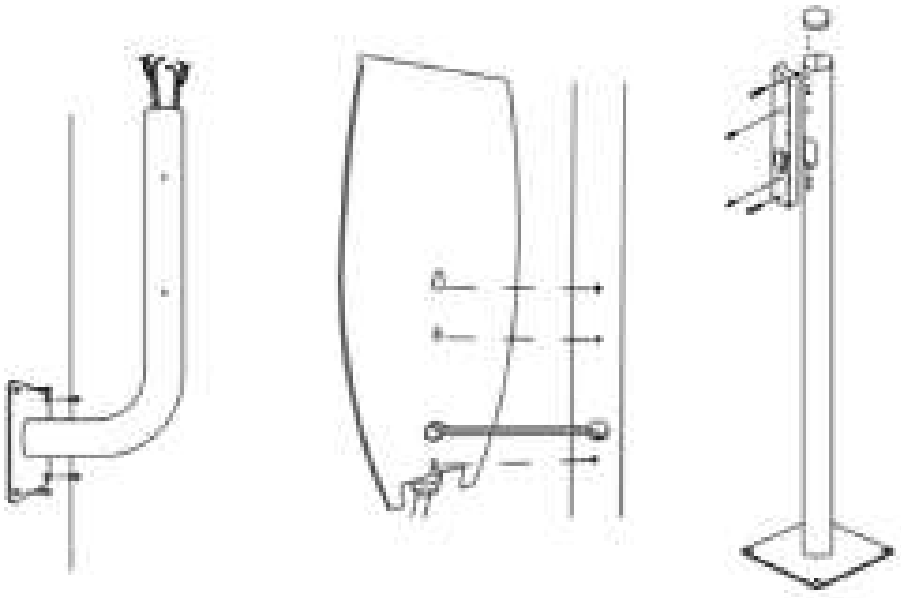
10.8 Choose mounting

EVBox BusinessLine charging stations can be mounted in the following ways:

Pole mounting in the ground, on the floor or on a wall

BusinessLine charging stations, single and double, can be mounted on an EVBox Combi pole set into the ground, a EVBox Combi pole fixed to the floor, or on a Combi pole fixed to a wall.

- The double charging station can be mounted directly onto a Combi pole without additional parts or accessories.
- The single charging station is attached to a Combi pole with the BusinessLine Adapter Kit. A separate installation manual is included.



The EVBox Combi poles for wall mounting have the following requirements:

- The wall must be able to hold a load of at least 70 kg.
- Mount the Combi pole onto a vertical surface so the bottom of the charging station is between 70cm and 110 cm above ground level.

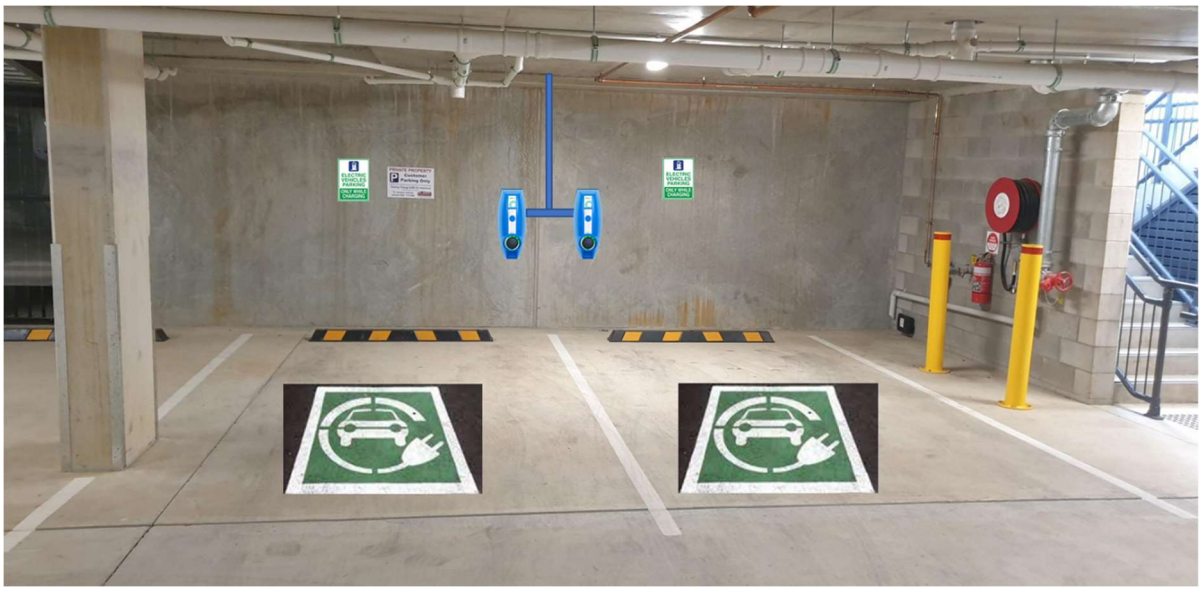
- Make sure that there is adequate free space (at least 30 cm) around the charging station for ventilation.
- Put the power supply cable either through the bottom cable gland of the charging station, or through the hole in the base plate.

Wall mounting

A single charging station can be mounted on an EVBox Wall Backing Box fixed to a wall.

- The wall must be able to hold a load of at least 60 kg.
- Install the bracket at a height of between 90 and 120 cm above ground level.
- Make sure that there is adequate free space (at least 30 cm) around the charging station for ventilation.

10.9 Mounting – Suggested Positioning



Notes:

- The bottom of the BusinessLine Mounting Box is 1200mm from ground
- The Parking Sign is in the centre of the carpark, and bottom is 1600mm off the ground

11 Install charging station

When the installation area is prepared and the charging station mounting systems are installed you can then install and connect the charging stations.

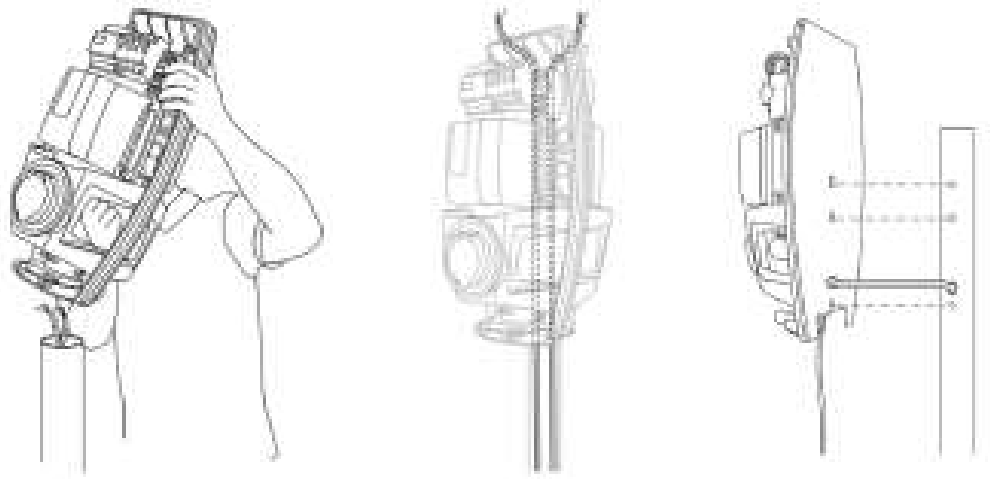
Make sure that connection of the electrical current cannot occur during installation. Put up caution tape and warning signs to mark the working areas. Make sure no unauthorized persons enter the working areas.

11.1 Install station – Single on Wall Backing Box

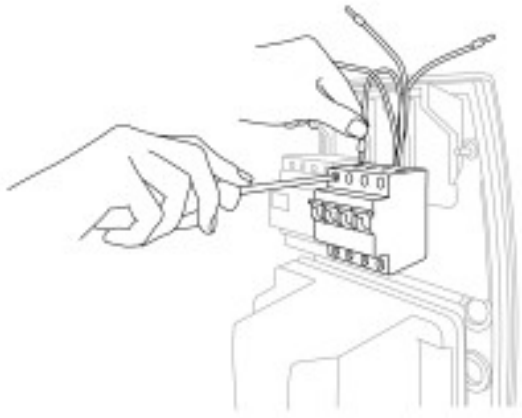
1. Hold the Backing Box on the back of the BusinessLine, and slot the head of the M8 Bolt into the keyhole in the centre. Adjust the M8 Bolt length and locking Wingnut, to be tight but manoeuvrable. Slide out and take apart. Leave the M8 Bolt and bottom M5 Bolt in the Backing Box.
2. Hold Backing box against the wall, with the solid part of the box facing you and the large entry hole at the bottom.
3. Mark the two-hole location on the wall, with a marker pen.
4. Drill the two holes, with a M8 masonry drill bit and a Hammer Drill.
5. Tap in the two M8 Blue Wall Plugs provided.
6. Push out the appropriate Rubber Grommet from the side of the box and fit with the right Conduit fittings.
7. Push the supply cable in through the conduit fitting and out through the large hole in the centre bottom. Also do the same with any incoming or outgoing Cat6 cabling for Hub/Satellite connection (using the 20mm holes)
8. Once cabling is in place, screw the Backing Box securely to the wall with the screws provided.
9. Slot the Cabling through the entry hold of the BusinessLine and Slot it over the two Bolts on the Backing Box.
10. Screw in the two M5 Bolts and Washers (provided) into the two holes drilled at the top, above the RCBO and kWh Meter. Making sure to attach the Earth Wire on the R/H Bolt.
11. Tighten both top and bottom Bolts. No need to try and access the M8 Bolt in the centre.

11.2 Install station – Double on Combi Pole

12. Lift and install the charging station onto the Combi pole or Wall Spacer. When installing a double charging station on a Combi pole, make sure that the charging station slides fully down the pole to rest on the internal stop inside the charging station.
13. When installing a single charging station on a Combi pole or a Wall Spacer, route the power able and the RS485 communication cable through the back plate.
14. Route the power cable and the RS485 communication cable (when used for a satellite installation) from the Combi pole or Wall Spacer to the top of the charging station.

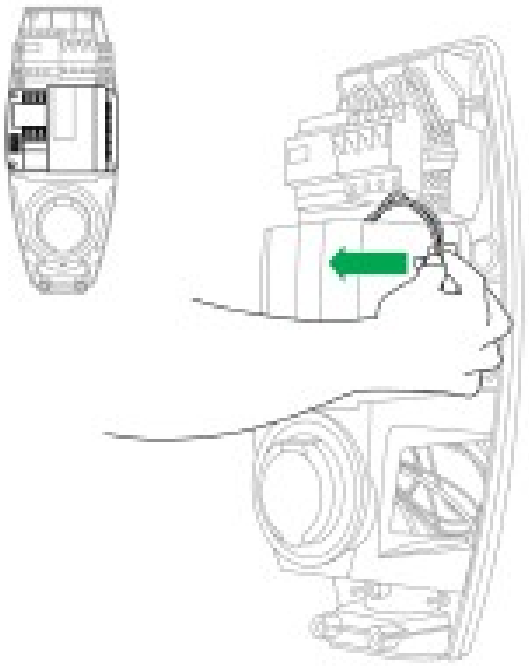


15. For a single station or a double charging station with one power supply: Connect the power supply cables to the circuit breaker (RCBO).

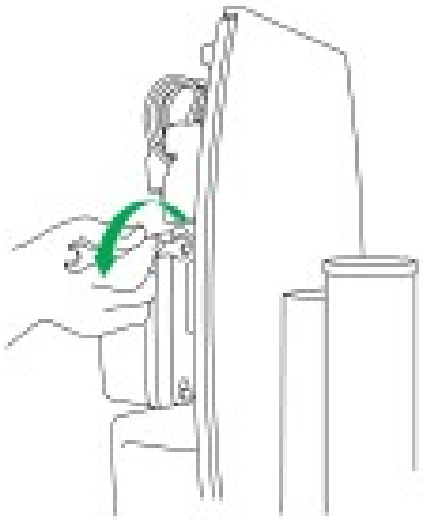


16. Secure the power supply cables with one or more cable ties.
17. For a charging station in a hub-satellite installation, connect the RS485 connectors to the controller (see Configure Hub-Satellite on page 21).
18. For a double station installed on a Combi pole:
    a. Connect the ground cable (supplied) to the grounding point next to the circuit reaker (RCBO).
    b. Align the grounding point in the station with the pre-drilled grounding hole in the Combi pole.
    c. Route the cable to the Combi pole grounding point.
    d. Connect the ground cable to the grounding point with the M6 bolt and washer (supplied).

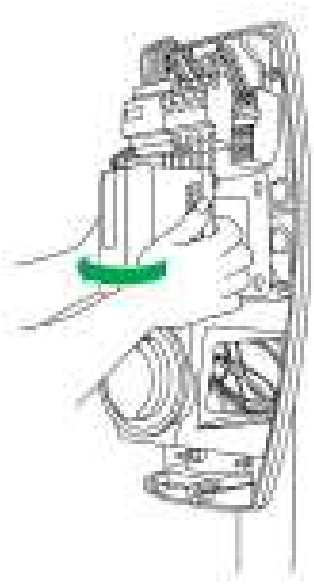
    e. Disconnect the connectors from the right side of the controller.



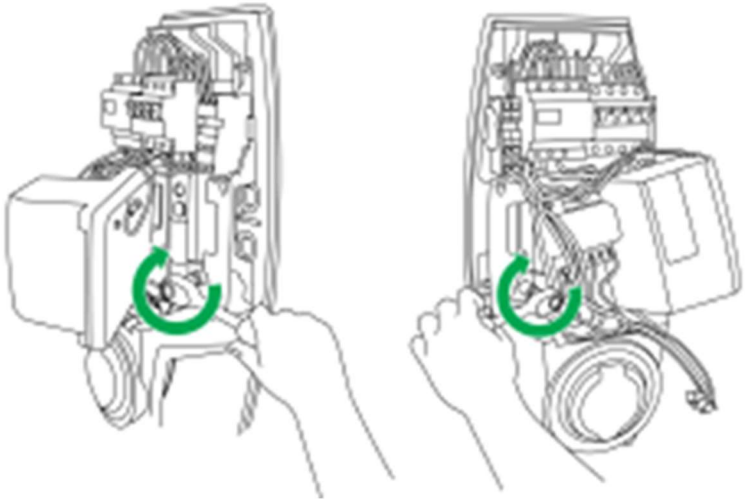
f. Loosen but do not remove the bolts attaching the controller to the bracket.



g. Remove the controller up to release the bolts from the slotted holes in the bracket. Move the controller to one side to access the Combi pole clamps.



h. Tighten the clamps with a socket wrench to secure the charging station on the Combi pole.

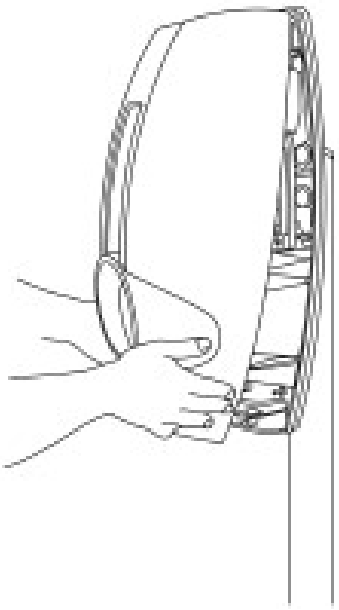


i. Install the controller and tighten the bolts.
j. Connect the connectors to the right side of the controller.

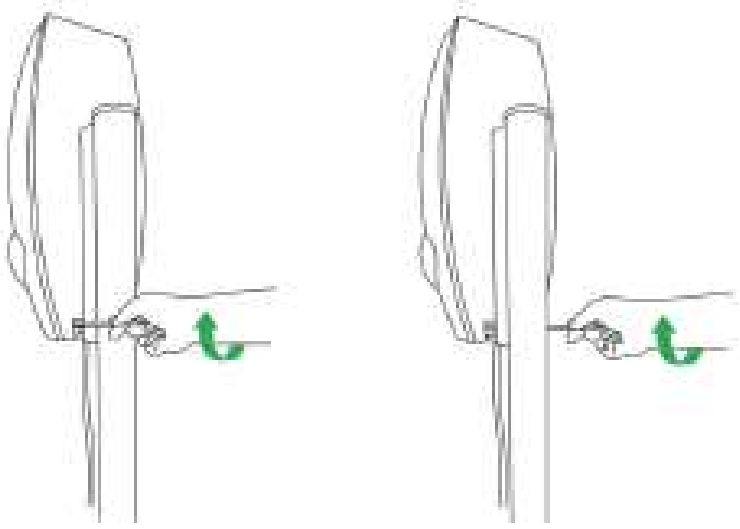
11.3 Finish installation

1. Switch the circuit breaker (RCBO) to the I (on) position.
2. Measure the resistance of the grounding circuit and make sure that it is in acceptable limits. If necessary, install a grounding point closer to the charging station.
3. Install the cover:
    a. Apply silicone grease to the seal around the charging station frame to ensure protection against water and dirt.
    b. Make sure the wiring around the plug is clear of the plug locking mechanism.
    c. Put the top of the cover over the top edge of the charging station frame and then pull the cover downwards.
    d. Make sure no wires are trapped around the edge of the cover.

e. Make sure the cover locks onto the frame and the rubber seals are in position to ensure protection against water and dirt.



f. Tighten the bolts at the bottom of the cover using the 5 mm hex key (supplied). When the charging station is mounted on a wall bracket, the space to tighten the cover bolts is very small. Use a small socket wrench with a 5 mm hex key bit, or short Hex Ball Key.



g. For a double charging station install the second cover in the same way.

4. Switch on the main power supply to the charging station. The charging station starts an automatic test (duration of maximum 60 seconds)
5. Monitor the LED ring around the socket to check the following:
    a. RED flashing: Booting, running test protocol, connecting to the network.
    b. GREEN (RFID-operated station) or OFF (autostart station): On standby, ready for use.
6. Measure the line-to-line and neutral-to-line voltages upstream of the power relays for every charging point.

12 Configure Hub-Satellite

A Hub-Satellite charging station installation can consist of up to 19 satellite stations connected to a hub station. A Hub-Satellite installation has the following advantages:

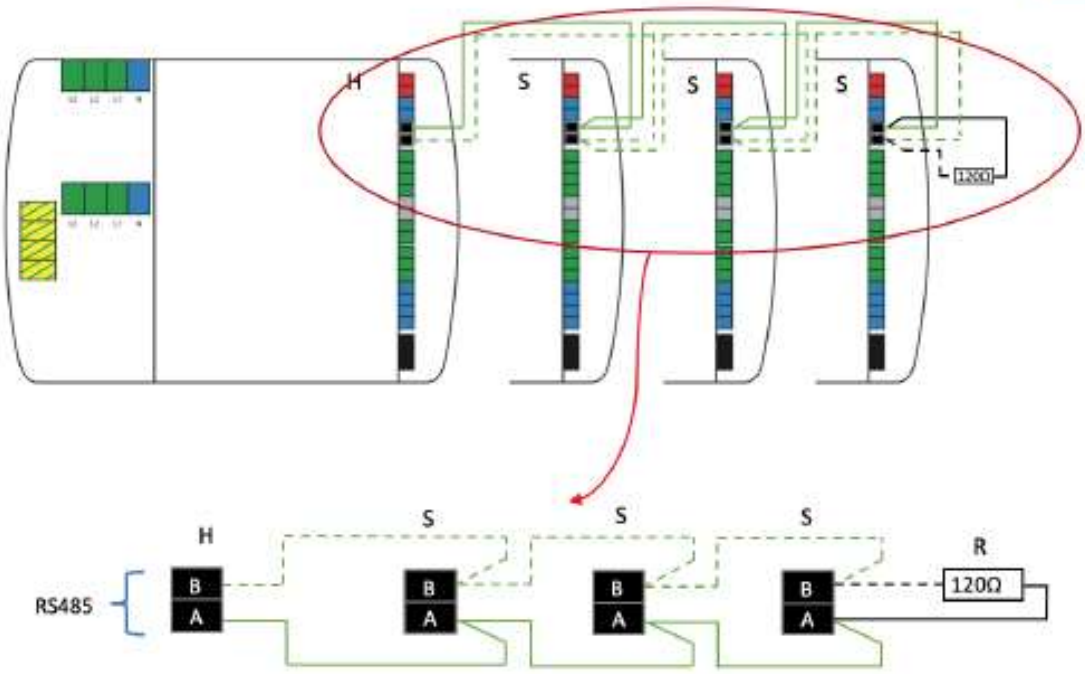
- It is easier to manage a group of satellite charging stations connected to one hub.
- Only a single communication module has to be installed externally for a location with poor reception.
- A smart grid can be established over all charging stations. This optimizes power usage and lets more vehicles charge simultaneously should power limitations exist.

12.1 Connect data cables

In a Hub-Satellite system, the hub contains the communication module and communicates with the satellite stations using a data cable. The data cables are attached in series between the communication port of each satellite then to the communication port in the hub. The communication port is the black 2-pin connector on the right side of the controller.

- Use a RS485 connector, 2-pin, black, for each RS485 connection.
- Use SFTP Category 6 network cable suited to the RS485 protocol for the data connection.
- Use the green/green-white twisted pair of wires for the RS485 connections.
- When there are more than two charging stations in series, two wires must be attached to the RS485 black connector of the last station in the series to make a loop.
- One BusinessLine hub can be connected to a maximum of 19 BusinessLine satellites.
- When more than six individual charging stations (or three double charging stations) are installed, the network must be terminated with a 120 Ω terminal resistor on the black RS485 connector of the last station in the series.
- For correct operation of a smart grid, a Hub-Satellite configuration must be connected from a single power cabinet. If a group of charging stations is powered from a different power cabinet, then that group stations must be a separate Hub-Satellite configuration.
- This method of installation cannot be used in a Star-shaped or T-shaped network because reflections can occur in the cable.
- In a Hub-Satellite installation, if one or more LED rings constantly flash red then there is a crossed connection in one of the satellite RS485 connections.

BusinessLine data connection to a BusinessLine hub:



Key:

H = Hub charging station controller.
S = Satellite charging station controller.
R = Resistor 120 Ω (only used when more than six charging stations are installed).

13 Activate BusinessLine

13.1 Using Wi-Fi with BusinessLine

BusinessLine is equipped with a multi-radio module. The wireless module includes dual-mode Bluetooth v4.0 (BR/EDR and low energy) and dual-band Wi-Fi (2.4 and 5 GHz bands). For Wi-Fi connectivity, the device supports Wi-Fi IEEE 802.11 (a/b/g/n) with a maximum reception range of 250 m (with minimal obstacles between BusinessLine and the nearest access point).

Notes on Wi-Fi security:

- Wi-Fi Protected Access 2 (WPA2), also known as WPA-Personal or 802.11i, is the most common security setting for Wi-Fi networks. WPA2 has replaced WPA.
- It is not possible to have WPA with AES/CCMP (Advanced Encryption Standard/Counter and CBCMAC Protocol) encryption or WPA2 with TKIP (Temporal Key Integrity Protocol).
- WEP (Wired Equivalent Privacy) and TKIP are not supported as they are considered unsecure. WEP is now deprecated in the 802.11i specification. Open networks are supported (i.e. networks with no password). However, it is not advised to use open networks for connecting BusinessLine.
- Enterprise security is the common name for all methods that use 802.1X to authenticate with a backend RADIUS server. Enterprise security is not supported by BusinessLine.

Some tips when configuring your Wi-Fi router and access point:

- Do not set the option to hide your network because a hidden network will not broadcast to BusinessLine.
- Make sure that your router is not limiting connections to certain MAC addresses.
- Set the Wi-Fi security to WPA/WPA2, also known as WPA Mixed Mode. This mode allows BusinessLine to connect with WPA TKIP-level encryption, and lets other devices use WPA2 Personal (AES) encryption.
- Make sure you set a strong Wi-Fi password. A minimum of eight characters are required in a password.
- Make sure that the a/b/g/n modes under the 2.4 GHz and 5 GHz frequencies are active. BusinessLine will choose the fastest available mode for its operation. 5 GHz is usually faster, but with shorter distances 2.4 GHz can be more accessible for BusinessLine. The installer or user must examine the signal strength of both networks during Wi-Fi setup on BusinessLine.

13.2 Check data connection

When the BusinessLine charging station is fully installed and power is on, you can use the EVBox Connect App to check that the hub station has a connection to the cellular network or Wi-Fi.

13.3 Set-up BusinessLine

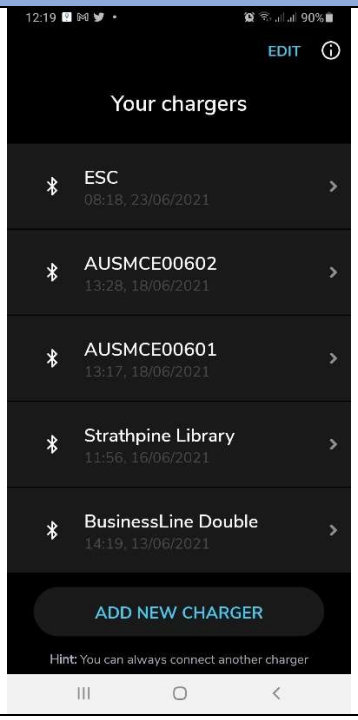
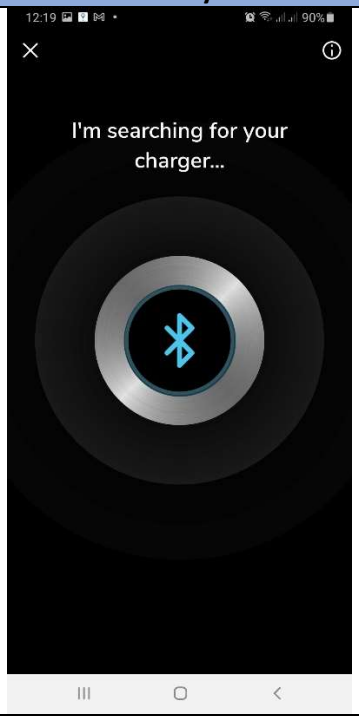
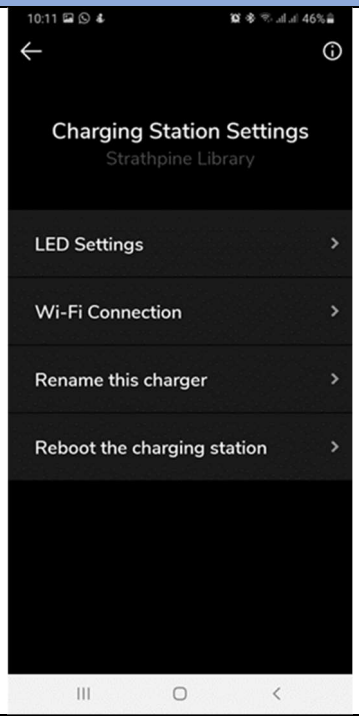
Download and open the EVBox Connect app, to set-up your BusinessLine ready for connection to a network.

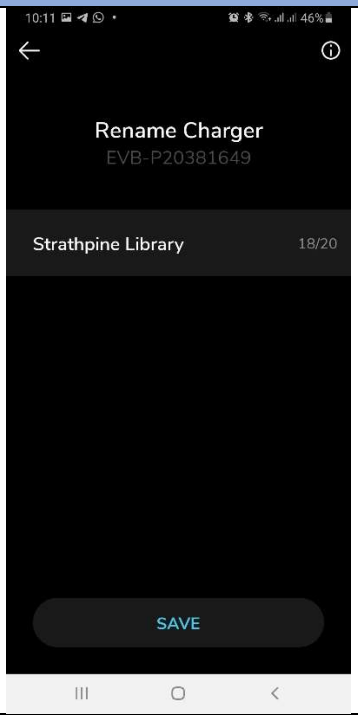
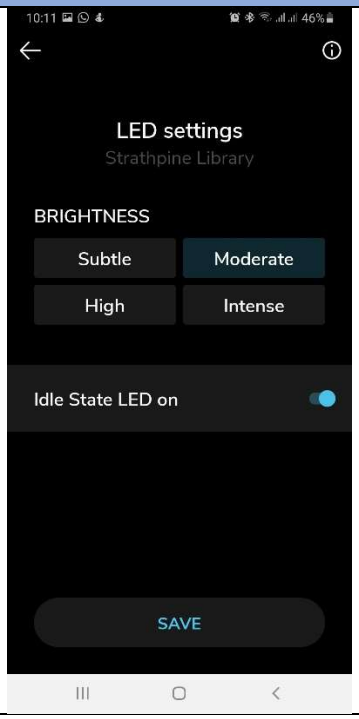
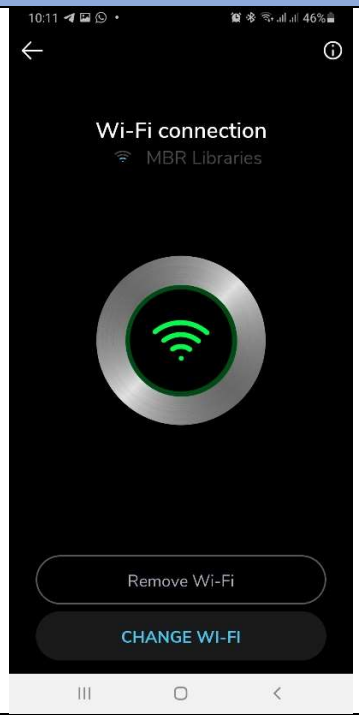
Note:

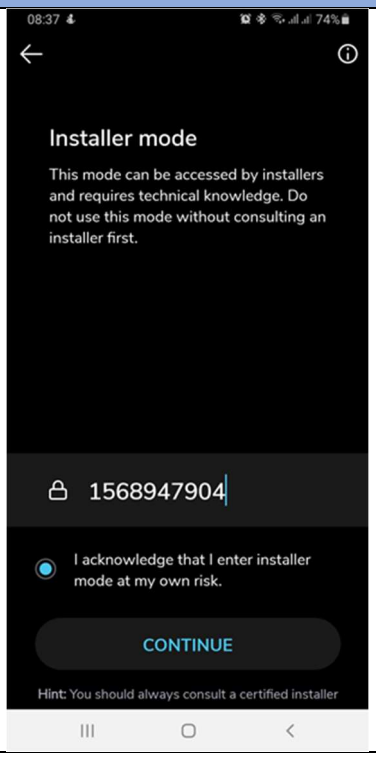
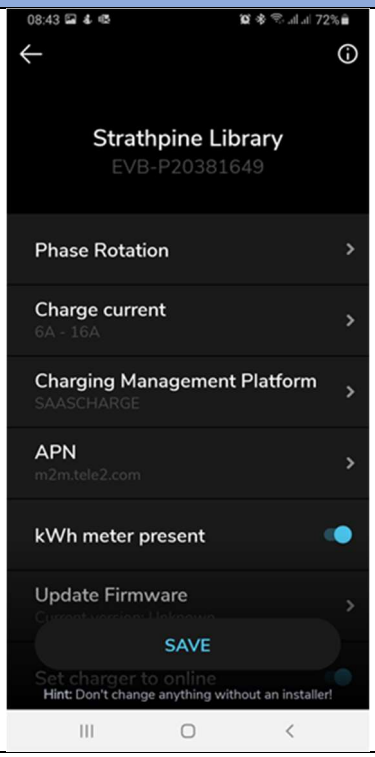
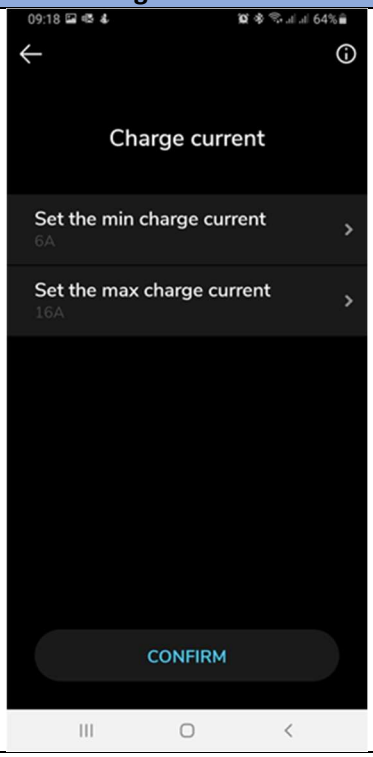
Locate and keep close the Sheet sent with the Charger that has on it:

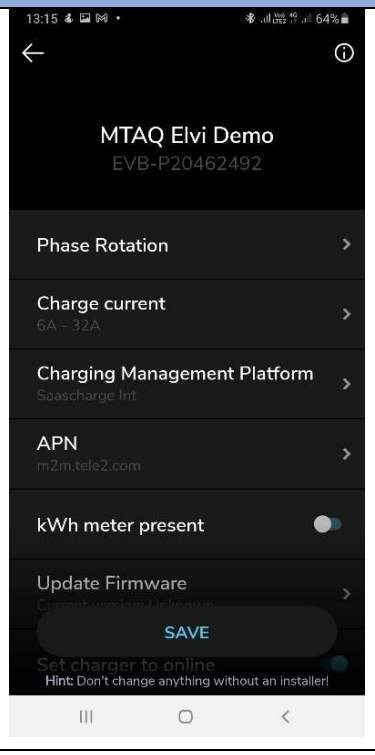
- Registration #: e.g., EVB-P12345678
- Security Code: e.g., 123456789
- Platform: SaasCharge
- URL: ws://eu-prod-socket.saascharge.com/websocket/CentralSystemService/

Then once you have the App open, follow the below instructions:

1, Find your Charger	2, Click on Add New Charger. Make sure that the Registration # matches. Entre the Security Code.	3, From the Charging Station Settings Menu, rename the Charger if you would like to.
		

4, Rename the Charger if you would like to.	5, Change to desired Brightness, and turn Idle state on. Save.	6, Locate Wi-Fi (if available), fill in details and Save.
		

7, Go into Installer Mode, and enter the Security Code again	8, Installer Menu	9, Set Max Charge Current – see section on Energy Management below
		

10, Ensure that 'Set Charger to online' is turned on	11, Click on Charging Management Platform. Select 'SaasCharge Int'. Save.	12, Make sure that you Save again. Then 'Reboot the Charging Station' when finished.
		

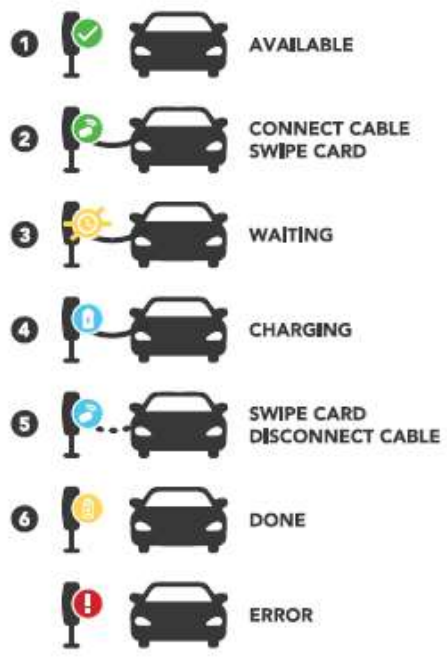
14Energy Management / Smart Charging

When connected to the Smart Charge backend software, we are able to configure the Chargers in an Energy Management set up. Meaning:

- This will manage the Hub / Satellite arrangement.
- One Charger will be nominated and set up as the Hub (Master). This Unit will contain the Chargepoint Modem, with an international e-SIM inside – for communications. As well as Wi-Fi, if available.
- The remaining Units (in the Group of 20), are Satellite. These are connected to the Hub Unit via a daisy-chain of Cat 6 Ethernet cables.
- The Hub Unit is set, in Smart Charge, with the maximum available current for the Group. The Hub will manage the Group to ensure that all combined charging stays below the set limit.
- A Dynamic Limit can also be set up, by a CT set up from the Mains Cable, through a RS485 communication to the Hub Unit modem. A backend algorithm will determine the available level that the Group of Chargers are allowed to charge at.
- Smart Charge Energy Management can also be set up to manage all Chargers on a Network, in the same way. Whether they are EVBox products or not. They just need to be OCPP compliant and connected the Smart Charge as well.
- Contact Smart Charge support for more information – support@smart-charge.com.au

15Using BusinessLine

15.1 Start charging with BusinessLine



1. Plug your charging cable into your car and into the BusinessLine charging station.

   The LED ring shows green.

2. Hold your charge card (RFID card) in front of the reader on the charging station.

   The LED ring flashes green, and you hear a beep. Your card is being authorized.

3. The charging station LED ring shows blue when your car is charging.

4. The charging station LED ring flashes yellow when your car is on pause and waiting to start charging.

5. The charging station LED ring shows continuous yellow when your car is charged.

Note:

- A flashing yellow LED indicator (once every second) shows a paused charging session. This is only possible in a hub-satellite configuration. Charging automatically resumes when power becomes available.
- For RFID card-operated charging stations, the LED status indicator shows green in standby mode. For Autostart charging stations that do not operate with an RFID card, the LED status indicator is off in standby mode.

15.2 Stop charging with BusinessLine

You can stop charging your car at any time, even if it isn't fully charged.

1. Hold your charge card (RFID card) in front of the reader on the charging station. The LED ring flashes green, and you hear a beep. Your card is being authorized.
2. The charging station LED ring turns green or is off when it stops charging.
3. Unplug your charging cable from your car and the charging station.

15.3 LED indicator ring

LED ring color	What you see	What it means	What to do
	LED ring off or green.	BusinessLine is ready for use.	Plug your charging cable into the car and the charging station.
	LED ring flashing green.	Your charge card is being verifed.	Wait until the LED ring turns blue.
	LED ring blue.	BusinessLine is charging the car.	Wait until the car has charged. You can also stop the charging at any time.
	LED ring yellow.	The car is fully charged.	Unplug your charging cable from the car and the charging station.
	LED ring flashing yellow.	Charging session is in queue (applicable for Smart Charging only).	When power becomes available, charging will start or resume and the LED ring will turn blue.
	LED ring red.	An error has occurred.	Check Troubleshooting on page 27 in this manual for solutions. If you cannot solve the issue, contact tour EV Hub installer for support.

LED ring color	What you see	What it means	What to do
	LED ring flashing red.	Your charge card is not authorized to charge.	Use the EVBox Connect app to check if the charging station is connected. Whitelist the charge card. Contact your charge card service operator.

16Troubleshooting

Troubleshooting must only be done by a qualified electrician unless otherwise stated. Incorrect installation, repairs or modification can result in danger to the user and may void the warranty and liability.

This is a general troubleshooting guide listing the most common issues. If you are not able to solve an issue, visit www.ev-hub.com for further help from our support team.

Problem	Possible cause	Solution
Charging station does not react	No power to charging station	• Check that the residual current device and circuit breaker on the main power supply panel are on. • Switch off the main power supply, wait 20 seconds, then switch on the main power supply again. • Check that the power supply cable connected to the charging station is live. The LED ring green should show green.
Residual current device trips constantly	Grounding error in the charging station	• Examine electrical wiring for damage. Replace damaged wiring. • Moisture or condensation on electrical connections. Dry the connections where necessary. If necessary, repair seals on charging station
	Fault in the vehicle or defective charging cable	• Replace the charging cable
	Ground resistance is too high for the vehicle type	• Measure the ground resistance and compare it to the resistance required by the supplier of the vehicle, for example Renault Zoe < 150 Ω.

LED ring flashes red immediately when the card is held against the reader.	Charge card is not authorized for charging at this charging station.	• Check that the charge card is authorized for use on public chargers. (Check by user) • Check the settings of your charging station in your online account. (Check by user)
	There is no communication with the backend.	• Use the EVBox Connect App to check that the hub station or hub module has a connection to the cellular network or Wi-Fi.
LED ring shows constantly red	Grounding fault	• Check that the electrical installation is correctly grounded. • If necessary, add additional grounding closer to the installation.
In a hub-satellite installation, one or more LED rings constantly flash red.	Crossed connection in one of the satellite RS485 connections.	• Examine RS485 cabling and connections.
	No connection with the hub charging station.	• Examine RS485 cabling and connections.
LED ring always shows yellow.	Vehicle is fully charged.	• Disconnect the charging cable.
	Charging station is waiting for vehicle.	• Check that the charging cable plug is inserted into the vehicle correctly. (Check by user)
	Vehicle is on a timer.	• Change the setting of the timer in the vehicle. (Done by user)
	The charging cable has a fault.	• Replace the charging cable. (Done by user)
	Ground resistance is too high for the vehicle type.	• Measure the ground resistance and compare it to the resistance required by the supplier of the vehicle, for example Renault Zoe < 150 Ω.
LED ring shows blue for a few seconds, then changes to yellow.	Vehicle will not charge	• Make sure that the minimum current accepted by the car is not higher than the minimum current supplied by the station. (Check by user.) • Check the line-to-line and neutral-to-line voltages at various locations on the power circuit(s). • Check that the electrical installation is correctly grounded.
Charging station does not start charging. LED ring flashes green for 30	No response from the backend portal account.	• Use the card again to start the charging. If the problem remains, contact your operator or service

seconds, then flashes red 10 times. LED ring changes to green or goes off.		provider for further support. (Check by user.)
	Plug not locked.	• Is the plug pushed far enough into the charging station? (Check by user.) • Examine the plug for damage or bent pins. (Check by user.) • Examine the socket to see if it is blocked by an object. (Check by user.)
	Vehicle not connected.	• Is the plug properly connected to the vehicle? (Check by user.)
	Charging station lock is blocked.	• Check if the charging station internal wiring harness blocks the plug locking mechanism.
Plug cannot be removed from charging station.	Incorrect card used to stop charging (LED ring flashes purple briefly).	• Use the same card to stop charging as to start charging. (Check by user.)
	No response from the backend portal account.	• Use the card again to stop the charging. If the problem remains, contact your operator or service provider for further support. (Check by user.)
	Plug lock will not release.	• Push the plug further into the charging station and hold the card against the card reader again. (Check by user.) • Switch off the main power supply, wait 20 seconds, then switch on the main power supply again.

17Disclaimer

The present document is drawn up by way of information only and does not constitute an offer binding upon EV Hub. EV Hub has compiled the contents of this document to the best of its knowledge. No express or implied warranty is given for the completeness, accuracy, reliability or fitness for particular purpose of its content and the products and services presented therein.

Specifications and performance data contain average values within existing specification tolerances and are subject to change without prior notice. Prior to ordering, always contact EV Hub for the latest information and specification. EV Hub explicitly rejects any liability for any direct or indirect damage, in the broadest sense, arising from or related to the use and/or interpretation of this document.

Smart EV Solutions Pty Ltd trading as both EV Hub and Smart Charge. ABN: 74 650 654 916

National Equipment Registration Responsible Supplier # E9093

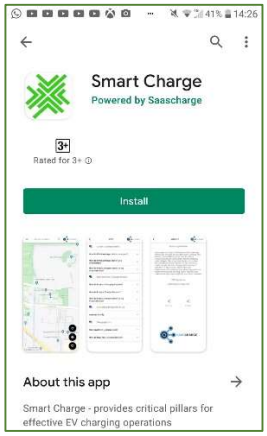
18Smart Charge - App Operation

Download the App

www.smart-charge.com.au

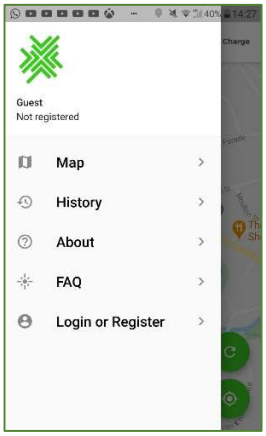
SCAN ME

#1.1 - Find and Install the App



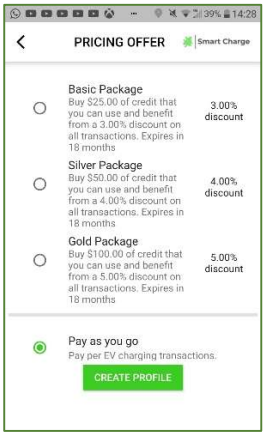
Find the App on your App Store by either searching, clicking on the links on the website, or scanning the QR Code above.
Hit Install.

#1.2 - Register your Account



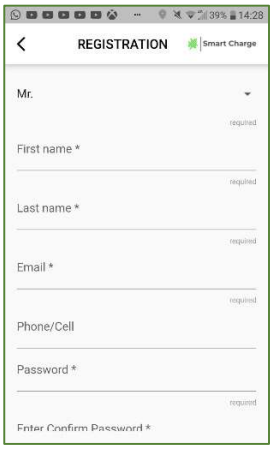
Once downloaded, click on 'Open' then expand the Menu by clicking on the three horizontal bars found at the top left-hand side. Click on 'Login or Register'.

#1.3 - Choose Pricing Plan



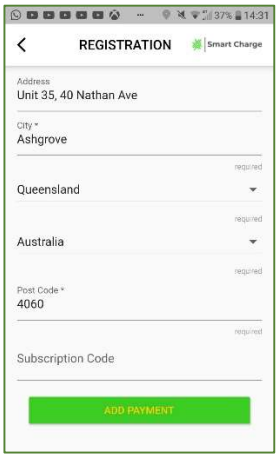
Choose a Pricing Plan - either 'Pay as you go', or a 'Package'. Note that Package Plans offer discounts and carry a validity of 18 months. Click 'Create Profile'.

#1.4 - Complete the Form



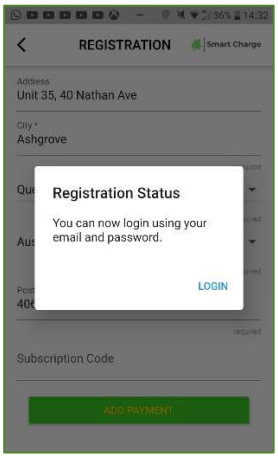
Fill out the Form with your Name, Address, Email Address and Mobile Number.

#1.5 - Add Payment



Please ignore 'Subscription Code', unless you are part of a Company Fleet Management Program. Click 'Add Payment'.

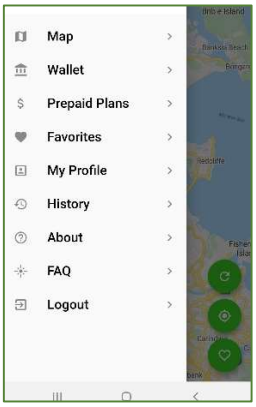
#1.6 - Finish Registration



Once you have entered your Credit Card details, click on 'Save'.

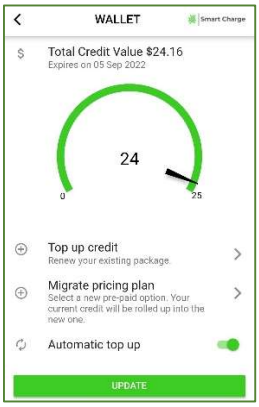
Page 2 – Charging your Vehicle

#2.2 - The Menu



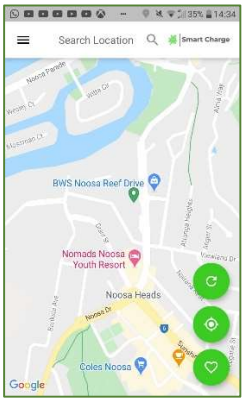
Log in.
Click on and open the 'Menu'.

#2.3 - Wallet



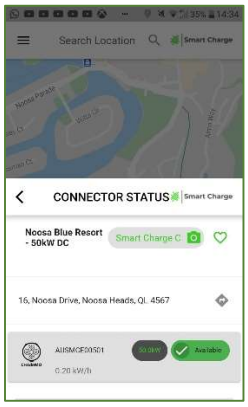
Your Menu may show a 'Wallet' if you have deposited credit into a Package.

#2.4 - Locate your Charger



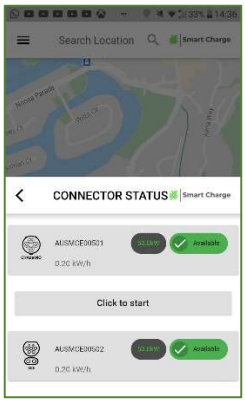
To locate your Charger, look for the Green flag on the Map. Click on the Flag

#2.4 - Connector Status



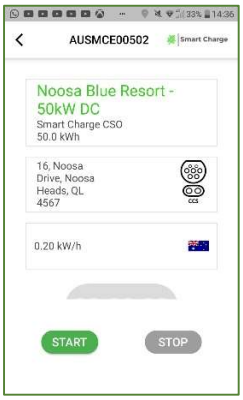
Check the green 'Available' icon for Connector Status. Also, the Connector Type available, kWh output and Cost of Charge.

#2.5 - Select the Connector



Once at the Charger, plug in the Connector to your vehicle and click on 'Click to Start' under that Connector Type on the App.

#2.6 - Start & Stop



Press 'Start' to begin your charge. Once your charge is finished, then press 'Stop' button.

Smart Charge 24/7 Support –1800 998 896

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