**EVB⬤X**

**Business**Line

**manual**

**Meet BusinessLine!**
Let's get started.

# **Business**Line

## manual

# **Table** of contents

# General

**Errors or inaccuracies**
For any inaccuracies or omissions, or to provide feedback and suggestions, send an email to help@evbox.com.

**Communication regulations (FCC)**
This device complies with Part 15 of the FCC rules and Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Americans with Disabilities Act (ADA) compliance**
While single-family residential installations do not have complex parking requirements, commercial, public, and multi-unit residential installation have additional parking considerations that include Americans with Disabilities Act (ADA) accessible Electric Vehicle Charging Station (EVCS) spaces and meeting the minimum requirements for spaces in parking lots and facilities. EVCS site hosts often experience challenges in providing ADA accessible EVCS spaces in addition to standard EVCS spaces while maintaining the minimum requirements for parking. Consideration of the available parking is important for residents as well as employers and employees. Installing charging in unassigned spaces or common areas for availability to all residents at Multi-unit Dwellings (MUDs) requires compliance with ADA accessibility regulations. Please check with your State and Local government agencies to understand and implement the necessary accommodations for people with disabilities.

**Product and environmental characteristics**
The charging station has been CE-certified by the manufacturer and bears the CE logo. The relevant declaration of conformity may be obtained from the manufacturer.

The charging station has been UL-certified by the manufacturer and bears the UL logo for USA and Canada. The relevant declaration of conformity may be obtained from the manufacturer.

The charging station complies with the RoHS Directive (RL 2011/65/EU). The relevant declaration of conformity may be obtained from the manufacturer.

Electrical and electronic appliances, including accessories, must be disposed of separately from the general municipal solid waste. Recycling of materials saves raw materials and energy and makes a major contribution to conserving the environment.

# **Safety** regulations

⚠ **Warning: risk of electric shock**

• Please read the documentation provided with the charging station to familiarize yourself with the safety regulations before you use the charging station.

• In the event of danger and/or accidents, have the charging station disconnected immediately by an electrician or facility manager.

• Do not operate the charging station if it, or the charging cable, is physically cracked, frayed, or otherwise visibly damaged. Please consult an EVBox employee, the distribution company and/or a qualified electrician right away.

• Do not direct powerful jets of fluids onto the charging station, and never operate with wet hands. Do not submerge the EV plug into liquids.

• Please carefully read our instructions and the vehicle's operating instructions in your owners handbook before charging your electric vehicle.

• Failure to follow these guidelines may result in serious injury or even death.


⚠ **Warning**: Turn off input power to your charging station at the circuit breaker panel before servicing or cleaning the unit. Be sure the station is powered off until the cover is properly in place.


⚠ **Cautions**

• Use this charging station for mode 3 compatible electric vehicles with an SAE-J1772 charge port only. Refer to your vehicle's owner manual to determine the suitable plug type(s).

• This product may impact the operation of implanted electronic medical devices. Before operating the charging station, check with the supplier of the electronic medical device if its operation can be influenced by charging effects.

• The charging station is powered by high currents. Always switch off power at the circuit breaker before installing, maintaining, or servicing the product.

• This charging station may only be installed, maintained, and repaired by qualified personnel.

• This product contains no user serviceable parts. Consult EVBox or your distributor for more information. Please do not attempt to service or repair the charging station yourself.

• Incompetent installation or repairs may result in danger to the user and could result in a voided warranty.

• Do not install a faulty charging station or a station with a noticeable issue. For instructions on installation, see page 17.

• Be sure that the charging station or the charging cable never come into direct contact with a heat source.

• Ensure that the equipment is used under the correct operating conditions (see "Technical specifications" on page 13).

• Do not use explosive or readily flammable substances in the vicinity of the charging station.

- Persons unable to assess the dangers involved in operating a charging station should not use the charging station.
- Do not allow children to operate this device. Adult supervision is required when children are in the proximity of a charging station in use.
- Make sure the charge cable is positioned so it will not be stepped on, driven over, tripped over, or otherwise subjected to damage or stress.
- Be sure that the charging cable is not kinked or jammed.
- 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 from overheating).
- Always pull on the plug's hand grip and never on the charging cable itself.
- Always store the EV plug in its designated cable holster.
- Do not place fingers or other objects inside the charging port or plug port.

**Remarks**

- This charging station has been designed and tested in accordance with international standards.
- This charging station must be used exclusively for the purpose intended.
- These directions for use are valid for different models of the charging station. It is possible that a number of features are described that may not be applicable to your charging station.
- The charging station complies with Safety Class I (the charging station is supplied with a ground terminal for safety) and voltage Category III.
- Do not modify the charging station in any way. This will result in loss of warranty and liability, and may lead to dangerous circumstances.

**Note**: *Some electric vehicles require an external ventilation system to prevent the accumulation of hazardous or explosive gasses when charging indoors. Consult the vehicle's owner manual to determine whether or not your electric vehicle requires ventilation during charging. This charging station is not designed for charging these vehicles and must not be used for charging electric vehicles that require external ventilation.*

**Transport and storage**
Ensure that the main power source has been disconnected when storing or transporting the charging station. No liability can be accepted for damage during the transportation process if the charging station is transported in anything other than its original packaging. Store the charging station in a dry environment. The product is preferably stored at room temperature. If this is not possible, storage temperature must be between 60°F and 110°F with a maximum humidity level of 95% non-condensing.

# **Product** description

## Meet BusinessLine

The EVBox BusinessLine is a commercial-grade charging station capable of charging all J1772 mode 3 compatible (plug-in) electric vehicles.

All EVBox BusinessLine charging stations are "unlocked" and use Open Charge Point Protocol (OCPP) to ensure that they never become stranded assets. They can be configurated to run on any OCPP service provider (see "Networking your station" on page 10). The station can also be configured to run without any service provider at all.

All BusinessLine charging stations are equipped with a number of Smart Charging features, like Load Balancing, Peak Shaving, and Hub/Satellite configuration (see "BusinessLine Smart Charging features" on page 10). These features reduce the amount of power used to charge vehicles during specified times, thereby minimizing costs while providing the best charging experience.

The EVBox BusinessLine is made with safety and user-experience as our top priorities. All EVBox charging stations are certified safe for both indoor and outdoor installations, and function optimally in an ambient temperature anywhere between -22°F and +130°F (UL certified for -22°F to +104°F) with a maximum humidity level of 95% non-condensing.

# **Components** & features

**1**

**2**

**3**

**4**
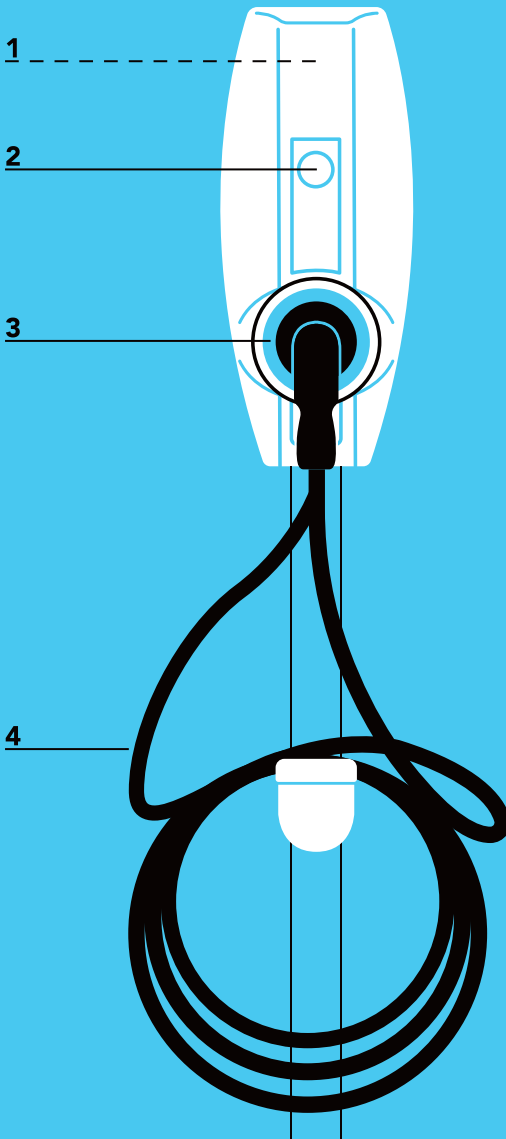
**1.** **Operating system**
BusinessLine can be
networked via an optional
modem, allowing users to
start and stop their charging
session remotely via an
OCPP back-office and a
mobile app.

**2.** **RFID reader**
This is the area where you scan
your RFID card or key fob.
The BusinessLine reads the
data from your card to start
or stop a charging session.

**3.** **LED ring**
The iconic LED ring.
BusinessLine's smart status
indicator makes clear what
the BusinessLine is doing at
all times.

**4.** **Charging cable**
BusinessLine charging
plug J1772 is compatible
with electric vehicles that
can handle capacities up
to 7.4kW.

## Networking your station

The smart charging station is equipped with an RFID card reader, a kilowatt-hour meter, and a UMTS/GSM/GPRS/GPS communication module. These components together provide the authorization and communication of the charging session procedure with the central system (back-office) for processing and settlement of the transactions as required.

EVBox stations are compatible with any OCPP service provider. **A GSM/UMTS network connection link with the connected charging station is essential for the Smart Charging station to function properly.** However, a good link cannot always be obtained in enclosed spaces (i.e., a closed or underground parking garage). In cases like this, the communication module should be positioned externally from the charging station along with the GSM/GPS antenna, and connected to the controller on the inside of the charging station. The external communication module cabinet and required connectors are sold separately through EVBox or your distributor (for more information go to page 30).

All BusinessLine stations come "unlocked" by default, meaning the charging station has no commitment to a networking plan. Optionally, you can add network services at any point in time, thereby enhancing your stations' Smart Charging capabilities, and opening yourself up to a whole new network of EV drivers.

## BusinessLine Smart Charging features

Smart Charging allows you to maximize your charging infrastructure and get the most out of your investment. This has been key to our continued success and is a true differentiator in the world of Electric Vehicle Service Equipment (EVSE). Below are BusinessLine's three primary Smart Charging features:

**Hub / Satellite configuration**
Operate multiple charging stations cost effectively with the Hub / Satellite configuration, which connects a group of charging stations (at one location) to each other through a single communication device. Carrying up to 20 charging ports, this configuration offers not only a reduced price on "Satellite" stations, but also allows you to operate your cluster of connected charging stations while only paying for one data plan (depending on network provider, port fees may apply).

**Load Balancing**
Load Balancing makes sure you never overdraw your building's capacity by spreading the available power between the charging stations, allowing you to accommodate as many drivers as possible. You can maintain safe and efficient charging at all times while keeping costs low.

**Peak Shaving**
Prevent high building demand charges with Peak Shaving. This service allows you to set up a maximum capacity for your charging stations within specific time frames. This way, you ensure that you won't exceed the desired limits of your property, keeping operational costs low.

# Operation

• A charging session may be started by simply plugging the car in (Plug 'n Charge), using an RFID card, or by using a QR code (depending on your selected configuration).

• The charging station is equipped with a self-testing internal residual current leakage detection device that will stop the charging process if current leakage (AC or DC) is detected.

• Charging will only start if the charging cable is properly connected to the electric vehicle. Some models are configured to start charging automatically when the charging cable is properly connected to the vehicle.

## Charging at a station using a QR code (for networked units)

**1.** Download the network provider's app to your smartphone and sign up (first-time use only).

**2.** Provide the requested details (if applicable, first time use only).

**3.** Connect your vehicle to the charge port.

**4.** Scan the QR code using the mobile app, or manually enter the charge station ID located on the QR label to start charging.

**5.** To stop charging, unplug the charging cable and reinsert it into the cable holster for the next user.

**Start**                                                                                      **Stop**
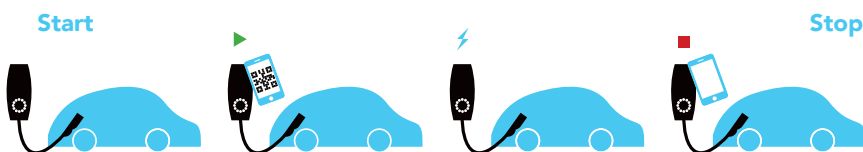


## Charging at a station using an RFID card or a key fob

**1.** Connect your vehicle to the charge port.

**2.** Hold an authorized RFID card or key fob (Mifare Classic, 13.56Mhz) against the RFID reader at the front of the charging station (see component 2 on page 9).

**3.** After scanning, the station will blink green for a few seconds while it registers your card. Once the ring turns solid blue, the charging session is initiated.

**4.** To stop charging, unplug the charging cable and reinsert it into the cable holster for the next user.

**Start**                                          **Stop**
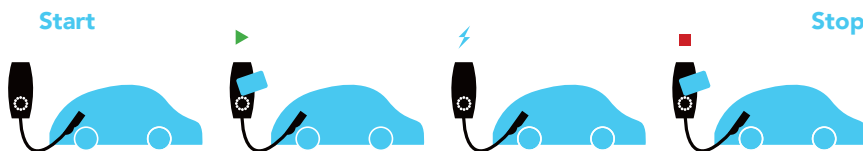
The LED ring mounted around the cable dock shows the status of the charging station so that you can see which mode the charging station is in.

| | What you see | What it means | What to do |
|---|---|---|---|
| ○ | LED off or green | Station is ready for use. | Plug the station's charging cable into the car. |
| ○ | LED green flashing | Your charge card or ID is being verified. | Wait until LED turns blue. |
| ○ | LED yellow | The car is fully charged. | Unplug the charging cable from the car and reinsert the cable into the cable holster. |
| ○ | LED yellow flashing | Station is awaiting communication from the car. | Wait until LED turns blue. |
| ○ | LED blue | Station is charging the car. | No action required. |
| ○ | LED red | Station is experiencing an error. | Contact our Support Desk via help@evbox.com. |
| ○ | LED red flashing | Your charge card is not authorized to charge. | Contact your charge card service operator, or contact our Support Desk via help@evbox.com. |

**Warranty**

EVBox North America warranties its equipment and software against errors and defects in materials and workmanship for thirty-six (36) months from the date of delivery. Within that time, EVBox will provide support to diagnose and repair the errors, if any. However, any such problems encountered out of any causes that are not attributable to EVBox shall be at the customer's risk and account (for more detail, check the warranty section on page 34).

# **Technical** specifications

Listed below are the general specifications for the BusinessLine. You can find more details about the technical specifications for a specific model in the "Specifications" section of EVBox.us.

| Technical Features | |
| --- | --- |
| Charging capacity per connector | 7.4 kW |
| Connector type | SAE J1772 |
| Number of connectors | 1 or 2 |
| Certifications | UL, cUL, CE, ENERGY STAR® |
| Power output | 208V-240V, single phase 32A |
| Temperature range (°F) | -22°F to +130°F (UL certified for -22°F to +104°F) |
| Temperature range (°C) | -30°C to +55°C (UL certified for -30°C to +40°C) |
| Humidity (non-regulating) | Max. 95% |
| Max. installation height | +6,500 feet above sea level |
| Authorization | Keyfob / RFID card / Mobile app |
| Communication | GPS / GSM / UMTS / GPRS modem / Controller with RFID reader |
| Communication protocol | OCPP 1.2, 1.5, 1.6S and 1.6J |
| Payment | Via service provider (networked only) |

| Physical Features | |
| --- | --- |
| Designed according to | IEC 61851-1 (2010), EC 61851-22 (2002) |
| Protection | NEMA-3R |
| Installation standards | EN 1010, IEC 61851-1 (2010), IEC 61851-22 (2002), IEC 60364-4-41 (2007), EN 62196-1 (2003), EN 60335-1 (2012), AC (2014) |
| Housing | Polycarbonate |
| Dimensions (in) | 10 x 8 x 24 in (L x W x H) - Single |
| | 10 x 16 x 24 in (L x W x H) - Double |
| Dimensions (mm) | 255 x 205 x 600 mm (L x W x H) - Single |
| | 255 x 410 x 600 mm (L x W x H) - Double |
| Weight (lbs) | 35 lbs (max.) - Single |
| | 60 lbs (max.) - Double |
| Weight (kg) | 16 kg (max.) - Single |
| | 28 kg (max.) - Double |
| Mounting | Wall / Pole / Retractor system (for two ports on a retractor, choose two BusinessLine Single units) |
| Standard colors | White (RAL 9016), Dark grey (RAL 7016), Blue (RAL 5017), |
| Cable (ft) | 18 or 25 foot cable (SAE J1772) |
| Cable (m) | 6 or 8 meter cable (SAE J1772) |

# **Inside** the box
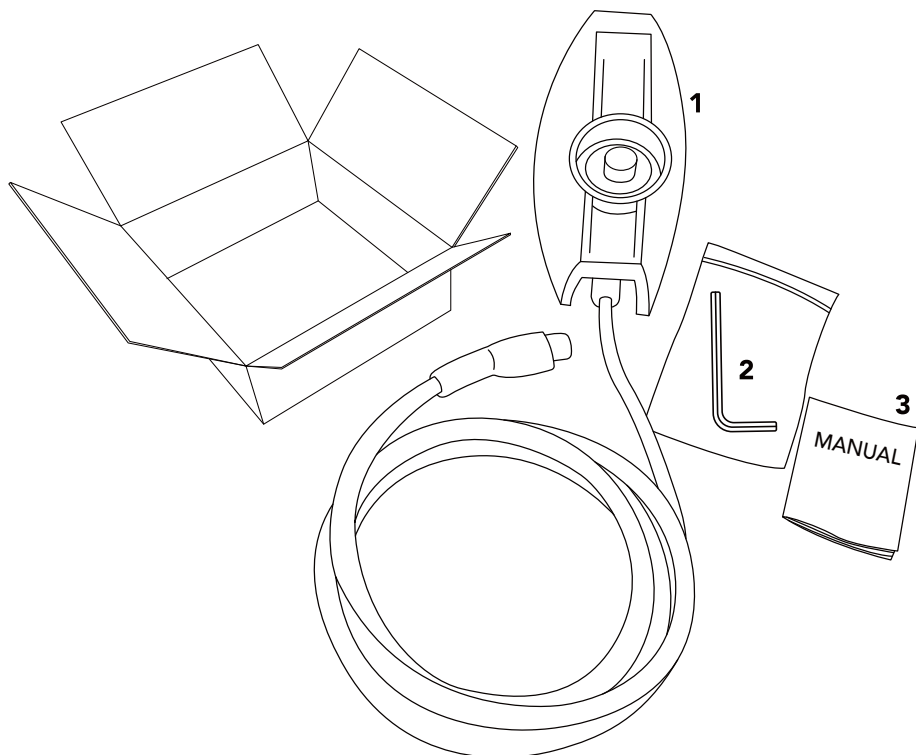


**1** EVBox BusinessLine
   Single or Double

**2** Allen key to open the cover of the unit

**3** Installation manual

# Installation

## Safety requirements

⚠ Connecting and installing this product must be done by a qualified electrician. The owner or facility manager is responsible for the installation, operation, and maintenance of the charging station, whereby both the law regarding the safety of persons, animals, and property must be observed, as well as the installation instructions enforced in the country of use.

⚠ Read the safety instructions before you start working on the installation.

⚠ Ensure the correct supply voltage/power and ensure that the meter cabinet is properly secured.

• Before shipment, each EVBox charging station is checked for correct connections and the charging station is operationally tested.

• Before switching on the charging station, check that the power source available corresponds to the configuration settings of the product as described in the manual.

• Check that all connectors are properly seated on the controller unit. (All stations are checked on this parameter before they leave our factories, but in rare instances, a connector can become loose or disconnected due to unforeseen transport conditions).

• Ensure that the equipment is used under the correct operating conditions.

• Never operate the product in wet, dusty, or explosive surroundings.

• Ensure that there is always adequate space (at least 8") surrounding the product for ventilation purposes.

## Planning the installation

**Minimum requirements**

• Each unit MUST be connected with its own dedicated power line – for a BusinessLine Double you need to run 2 power feeds.

• Calculate the existing electrical load to determine the maximum operating current.

• Calculate the distance to ensure minimal voltage drop.

• Obtain any necessary permits from the local authority that has jurisdiction and confirm that the follow-up inspection has been scheduled by a qualified electrician after the installation is complete.

• Use only copper conductors.

• Use conductors that are sized in accordance with local wiring regulations. The selected cable gauge must be able to sustain periods of a constant load up to 40A.

• Each unit should have a dedicated 40A circuit breaker.

⚠ The charging station is set to charge at a maximum current of 32A by default, requiring a 40A upstream circuit breaker. The maximum allowable current can be decreased according to available amperage. This must be configured on-site by a technician, or remotely in the case of a networked station. EVBox highly recommends planning your installation for 32A current. **Make sure the maximum current settings are correct.**

**Location**
Position the charging station, where possible, in surroundings not subject to extreme conditions and where it's not prone to damage. The charging station can either be installed against a sturdy wall or on the optional stainless steel pole. To accommodate wall mounting, a wall spacer or wall mount bracket is available as an option. Consult EVBox or your distributor for more details.

## Pre-installation checklist

* The conduits are laid and the correct gauge copper wires are used for installation.
* Cellular network connectivity at the location is good (Networked and RFID only).
* Current capacity of the site is already known (Amps).
* Required tools are available – we recommend a mini ratchet for tight areas.
* An electric vehicle or an EVSE tester is available to complete the installation.
* The mounting option is selected and necessary provisions are made.
* All the units and accessories ordered are delivered, inspected, and free of damage.

# **Installation** steps

### **How to open the cover(s)**

**1.** Locate the two screws at the bottom of the
   unit (four screws for the BusinessLine Double).
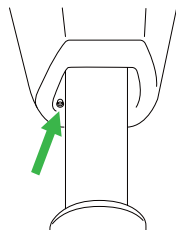
**2.** Use the Allen key provided to unscrew
   (as shown in the image).
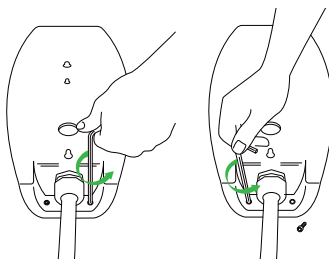
**3.** Open the cover from the bottom as
   shown. For BusinessLine Double stations,
   lift up on the charging cable to give the
   cover proper clearance.
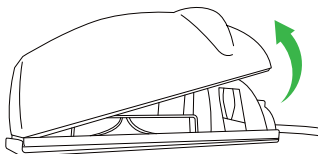
## **Step 1: Running the power supply cable**

The maximum power rating for the each connector is 7.4 kW or 32A at 240V AC (single or split
phase). Run a power line from the main circuit board with an appropriately rated circuit breaker.
Use a conduit to run the power line to the charging station. The power line enters the station
via the backplate in the case of a single station and through the center cavity for double stations.

**Note:** BusinessLine Double stations need two separate power cables with separate circuit
breakers.

**1.1** Remove the cover(s). They are attached to the underside of the charging station with
   two hex bolts. For this, use the Allen key (5mm - metric) provided with the charge station.
   When mounting the charging station to a wall, the free working space behind the station
   is limited. For these situations we recommend using a 5mm mini-ratchet. See "How to
   open the cover(s)" (above) for illustrations.

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**1.2** The power cable enters the station through the central opening on the back plate (Single), or through the center cavity (Double).

**1.3** The power connector terminal is located at the top of the station. Make sure the power supply cable extends out at least 2.5 feet so as to comfortably reach the terminal block.

# Step 2: Installing the mounting options

## 2a. Mounting the CombiPole

- EVBox charging stations can be mounted onto a pole. To do this, EVBox offers two types of CombiPole:
     - Surface mounted (PN# 290305)
     - Inground (PN# 290150)
- BusinessLine Single stations are to be attached to the CombiPole by using the BusinessLine Adapter Kit (PN# 290165) (image below).
- The BusinessLine Double stations can be mounted directly on the CombiPole.
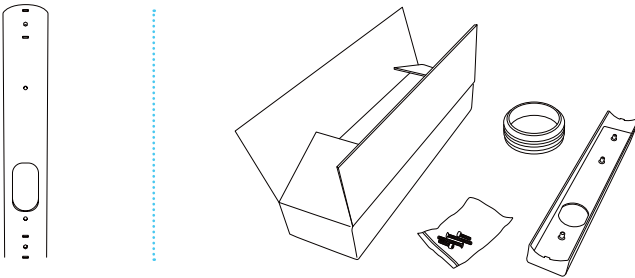


**Surface Mounted:**

- CombiPole (PN# 290305) can be mounted onto a concrete surface.
- CombiPole is mounted with four bolts (not provided) to secure the pole to the concrete.
- The base plate measures 8" x 8" with four holes (25/64" diameter) for attachment.

**Inground:**

- CombiPole (PN# 290150) can be mounted in soil or dirt.
- Dig a hole approximately 2.5 feet deep and 10 inches wide.
- Ensure that the mounting holes for securing the charging station are in the correct position with respect to the parking space(s) and align the pole (PN# 290150) vertically.
- Use well-known best practices to solidify the poles foundation.

**Installing the Adapter Kit onto the CombiPole (BusinessLine Single only)**

- Using the two M5x40 bolts, attach the adapter to the CombiPole as shown on the following page.
- Partially mount the two M5x16 bolts on the adapter kit.
- The two M5x16 bolts will be used to mount the unit onto the adapter kit and as such, should only be partially screwed in. They are tightened after the unit is mounted.

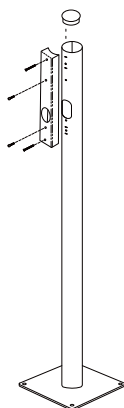To see how to mount your station to the CombiPole, skip ahead to page 22.

**2x** Socket bolt M5x16

**2x** Counter hex head bolt M5x40

**1x** Circular insert cap

## 2b. Mounting on a wall

### Mounting a BusinessLine Single

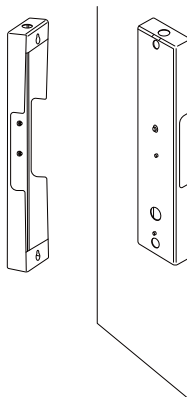A wall spacer is used to mount a BusinessLine Single onto a wall.

Choose a solid and flat vertical mounting surface to install the wall spacer (PN#290190). The wall should be able to hold at least 60 lbs.

Drill holes onto the flat surface to install the wall spacer using the holes on the wall spacer.

Power supply conduit can enter the unit through the top, bottom, or side of the wall spacer.

Lead the power cables out of the hole in the center of the wall spacer. EVBox BusinessLine will mount onto the wall spacer.

A wall mount cable holster is also available for cable management.

### Mounting a BusinessLine Double

A wall mount bracket (PN#290600) is used to mount a BusinessLine Double onto a wall.

Choose a solid flat vertical mounting surface to install the wall bracket. PN#290600 (The wall should be able to hold at least 100 lbs).

Drill holes onto the wall, aligning it with the holes on the base plate of the wall mount bracket as shown in illustration on the following page.

Power supply cables enter the bracket as shown in the illustrations on the following page.

Lead the power supply cables all the way through the bracket. The BusinessLine Double slides onto the top of the bracket.

To see how to mount your station to the wall bracket, skip ahead to "Pole mounting for BusinessLine Double" on page 22.

In the event of a retrofit with exposed conduit, please consult your EVBox contact for best practices before mounting your wall bracket (PN#290600).

In instances where the conduit is run along the wall, you may use a wall spacer, metal framing struts, or a junction box in between the PN#290600 bracket and the wall. This installation method is only advised if the PN#290600 bracket is directly bolted into the wall.
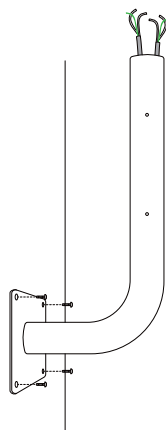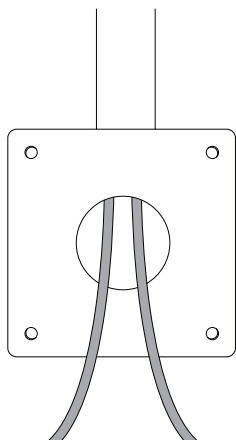
## 2c. Mounting a retractor cable management system

- EVBox BusinessLine Single units can also be mounted onto a taller post which provide superior cable management. The system doesn't let the charge cable touch the ground (PN# 290152).

- Two types of posts available:
  - For BusinessLine Single unit (mounted on one side) – (PN# 290152S)
  - For two BusinessLine Single units (mounted on two sides) – (PN# 290152D)

- The retractor system consists of two parts — the retractor post and retractor box. The box is mounted on the top if the post using the pre-drilled holes.
  - Retractor Box – (PN# 290151)
  Note: To mount two units, two retractor boxes need to be mounted on opposite sides.
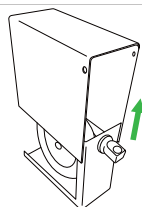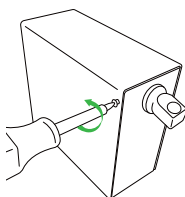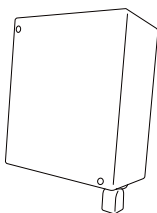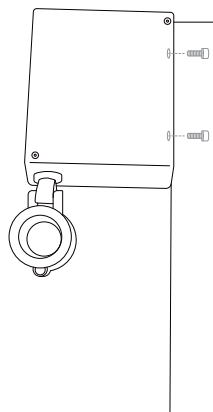
## Mounting the retractor post

- The retractor post is mounted on a concrete surface using the four holes on its base plate.

- We recommend you use deep anchor bolts for a secure installation.
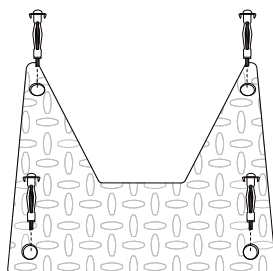


## Attaching the cable to the retractor

- Put the hose sleeve around the charging cable, and slide it into desired place (fig. 1).

- Place the hose clamp around the outside of the secured hose sleeve, ensuring that the top part of the clamp is facing up and in the direction of the reel (fig. 2).

- Then, while holding the hose clamp in place, snap it onto the piece at the end of the cord. Secure hose clamp to the cord with bolt (fig. 3, 4A, 4B).
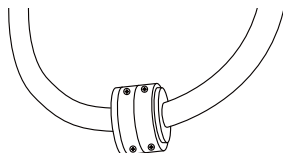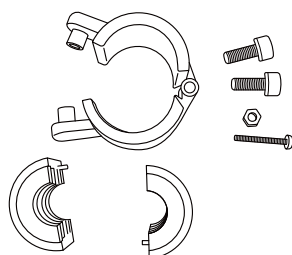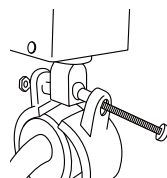
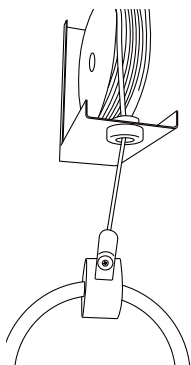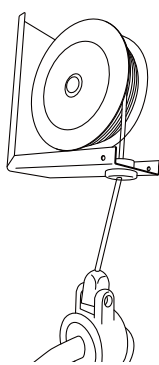

Fig. 1
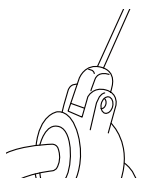
Fig. 2

Fig. 3



Fig. 4A

Fig. 4B

To see how to mount your station to the retractor system, skip ahead to page 24.

# Step 3: Mounting the BusinessLine

## 3a. Pole mounting

**Pole mounting for BusinessLine Single**
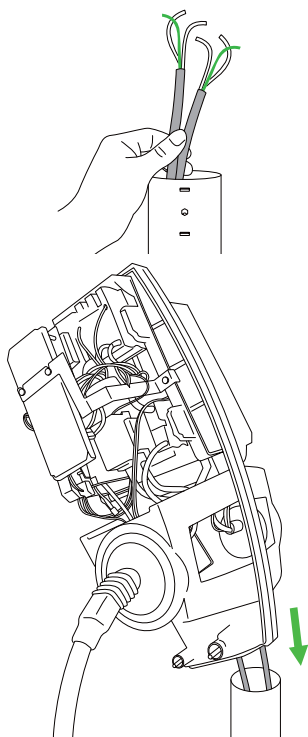
Mount the adapter kit as shown on page 18.

• Mount the screws as shown.

• Run the power cables out of the hole in the center of the adapter kit and through the hole in the backplate of the station.

• Align the holes on the back plate of the unit with the screws on adapter kit.

• Hang the unit onto the screws and pull the unit down to secure it.

• Tighten the screws.
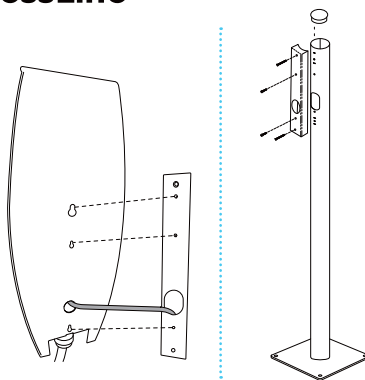
**Pole mounting for BusinessLine Double**

Mounting the dual unit on the CombiPole does not require an adapter kit.

• Snake the power cables to the top of the pole. Keep at least 2.5 feet of slack for the power cable to reach the top of the charging station.

• Slide the BusinessLine Double onto the pole, snaking the power cables through the center cavity towards the top of the unit where the terminal block is located. Note: The BusinessLine Double requires two power inputs.

• Make sure not to trap any wires during the process.

• Affix the station to the pole by tightening the two M10 bolts on either side of the metal tube clamp (see following illustration).

• Secure the charging station to the pole by screwing the M5 bolt through the hole at the bottom of the station (see following illustration).
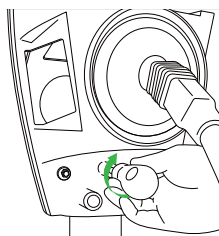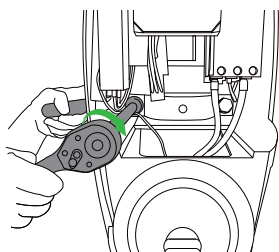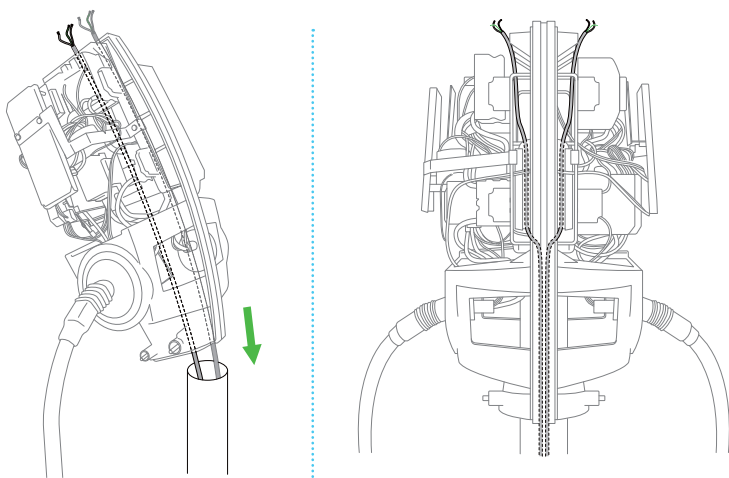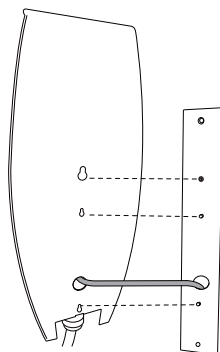
## 3b. Wall mounting

**Wall mounting for BusinessLine Single**

- Mount the screws as shown.
- Run the power cables out of the hole in the center of the wall spacer and through the hole in the backplate of the station.
- Align the holes on the back plate of the unit with the screws on the wall spacer.
- Hang the unit onto the screws and pull the unit down to secure it.
- Tighten the screws.

**Wall mounting for BusinessLine Double**

- For wall mounting a BusinessLine Double, please refer to the steps for pole mounting a BusinessLine Double on page 22.

## 3c. Retractor pole mounting

• Mount the screws as shown.

• Run the power cables out of the hole in the center of the retractor pole and through the hole in the backplate of the station.

• Align the holes on the back plate of the unit with the screws on the retractor pole.

• Hang the unit onto the screws and pull the unit down to secure it.

• Tighten the screws.
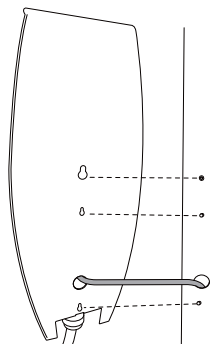
# Step 4: Wiring the station
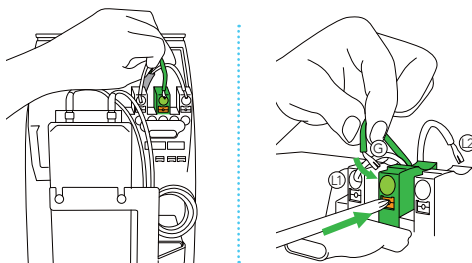
**Running the power cable:**

- Lead the power supply cable into the bottom of the pole/bracket and through the wire opening slot.
- Gently snake the wire through the pole/bracket and ensure that it protrudes at least 1.5 – 2 feet outside of the central wire exit.
- Ensure that the power supply cable has sufficient length inside the pole to prevent power supply line damage by small movements of the pole or bracket.

## 4a. Wiring the BusinessLine Single (pole/wall/retractor)

**1.** Insert the power cable through the hole in the back plate.

**2.** Snake the power cable upwards into the tunnel above the hole.

**3.** Continue snaking the power cable from behind the components using the tunnel.
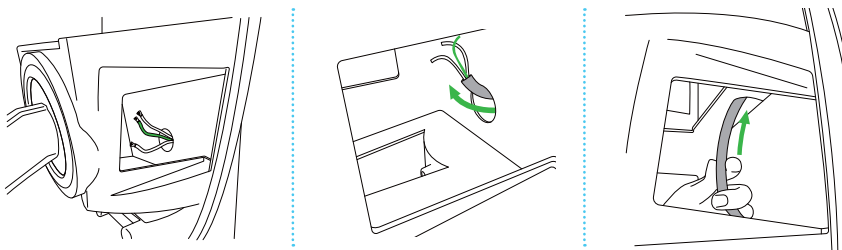


**4.** Pull the cable from the top of the unit. The power cable needs to be attached to the terminal block located on the top of the unit. Strip the ends of the power supply cables, if not done already.

**5.** Using a screw driver, push the spring clamps to connect the power supply cables to the power line terminal blocks labeled L1, GND (ground) and L2. The ground (often green or yellow/green) must be connected to GND, L1 (often brown or black) is connected to terminal L1, and L2 (often white) is connected to terminal block L2.



25

## 4b. Wiring the BusinessLine Double (pole/wall)

**1.** Insert the power cables through the center cavity.

**2.** Snake the power cables upwards into the tunnels above the cavity.

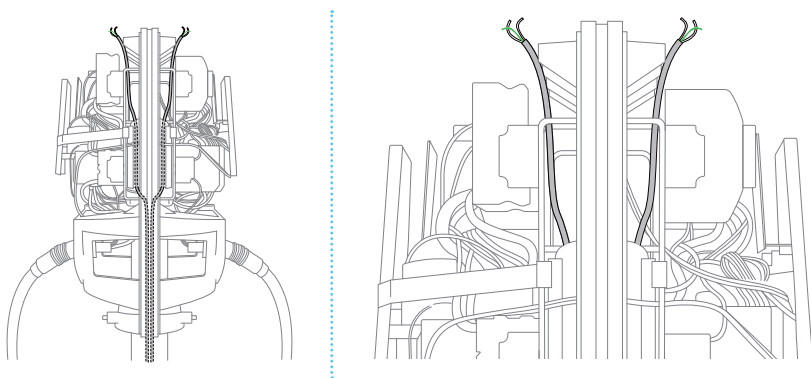**3.** Continue snaking the power cables from behind the components using the tunnels (one set of cables per side — two hot and one ground apiece).



**4.** Pull the cables from the top of the unit. The power cables needs to be attached to the terminal blocks located on either side at the top of the unit. Strip the ends of the power supply cables, if not done already.

**5.** Using a screw driver, push the spring clamps to connect the power supply cables to the power line terminal blocks labeled L1, GND (ground) and L2. The ground (often green or yellow/green) must be connected to GND, L1 (often brown or black) is connected to terminal L1, and L2 (often white) is connected to terminal block L2. Repeat for other side of the unit.
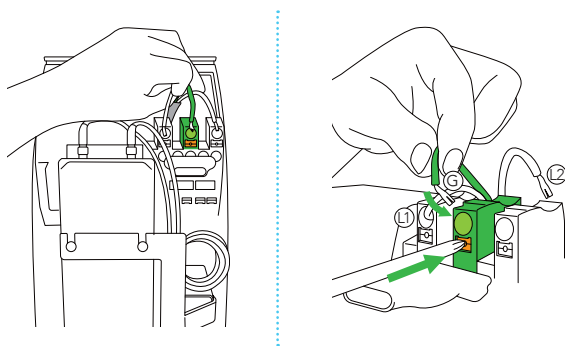
# Tips and tricks for easy install

In certain cases, installation can be simplified if the charging cable is removed. The following are steps to remove the charging cable.

- Unscrew the blue and the brown cables form the contactor labeled T1 and T2 (see below).
- Unplug the yellow/green ground wire from the spring clamp.
- Unplug the thin red wire (pilot signal).
- Unscrew the wire gland at the bottom.
- Pull the charge cable out.
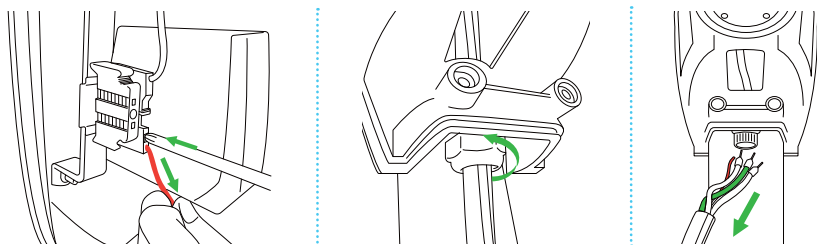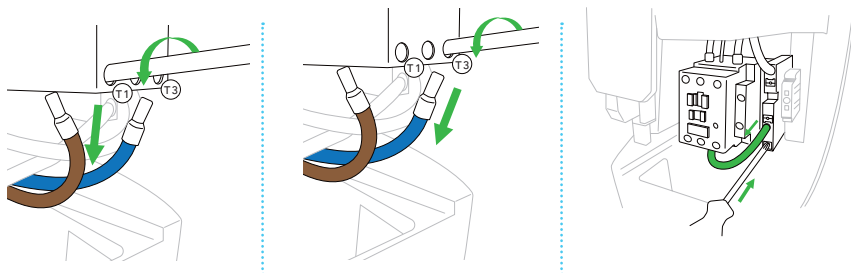


- After completing the wiring steps, reconnect the charging cable following the steps listed above in reverse order.
- Figure below shows how the charge cable looks after reconnecting all the cables.
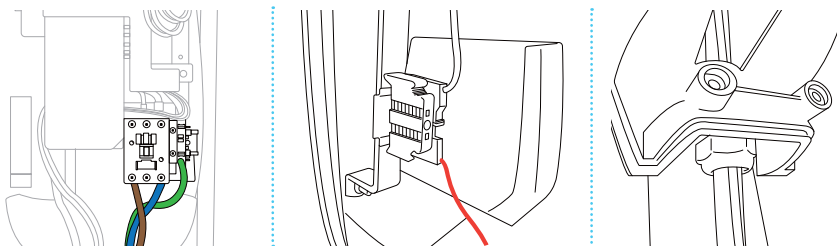
# Step 6: Testing and completion

**1.** Check all plug connections on the controller and communication module by firmly pressing all connectors into position and ensuring they're all in the correct spot (matching color and size).

**2.** Power up the unit. The charging station will now carry out an automatic test. The LED ring around the socket will show the following color indications during the test (max. 60 seconds):

• Red flashing: Starting up, running test protocol, and establishing a connection to the network.

• Green flashing: Standby, ready for use.

**3.** Close the covers as shown:

• Hang the cover(s) onto the frame by inserting the top into the edge of the frame and hinging the cover(s) downwards. For BusinessLine Double stations, lift up on the charging cable to give the cover proper clearance.

• Make sure that the cover(s) lock into the frame properly and that the rubber seals are in place in order to guarantee NEMA-3R protection. Check also that the cover(s) lock securely into the open notch at the bottom of the frame.
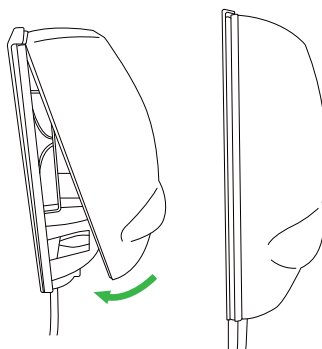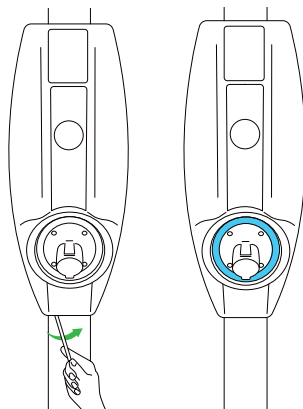
Note: Do not close the cover until the post-installation checklist is completed (see page 29).

**4.** Screw the cover(s) back on using the space under the unit.

• We recommend a mini ratchet to access tight spaces

**5.** Test the unit with an electric vehicle or an EVSE tester.

# Post-installation checklist

- Power on only the Hub at first, for Satellites follow "Assigning the correct connector IDs for each station/port" (see below).

- The LED ring must be solid green when in the ready state.

- Check all the connectors on the controllers.

- Measure the voltage and current at the terminal block. For split phase 120V system, the voltage between L1 and L2 should be above 180V.

- Initiate a charge session using an electric vehicle or an EVSE tester.

- The LED ring should turn blue when the charge session is in progress.

- For networked stations, call the number on the charging unit to commission the station. For units that are RFID only, email help@evbox.com.

### Assigning correct connector IDs to each station/port

- The Hub unit (with communication module) comes with a pre-installed top label with the QR code (station ID) and connector ID #1.

- Included in the box with the Hub unit, there are an additional 9 top labels for Satellites with the same QR code (station ID) but different connector IDs (#2-10).

- Assigning connector IDs to Satellites:

    - The Hub is assigned connector ID #1 (the Hub should be powered on first)

    - All the Satellites need to be powered on one at a time. The first satellite to be powered on will automatically be assigned connector ID #2. The second satellite to power on will be assigned connector ID #3, and so on.

    - After all Satellites are powered on, call the network provider or use their mobile app to start a charging session on each connector. Once the connector ID is confirmed for all the Satellites, apply the corresponding top label.

### Accessories

Cable wrap and holster for BusinessLine Double on a pole or wall – (PN# 290120)
Cable wrap for a BusinessLine Single on a pole – (PN# 290121)
Cable wrap for a BusinessLine Single on a wall – (PN# 290122)

# Maintenance

The owner or user is responsible for the maintenance of the charging station, whereby both the law regarding the safety of persons, animals, property must be observed, as well as the installation regulations in force in the country of use.

- Dirt on the outside of the charging station can be cleaned off using a soft damp cloth.

- Regularly check the EV plug for damage and for foreign matter inside the EV plug.

- To protect the charge cable when not in use, an EV plug holster for pole mounted charging stations is available as an option.

- The EV plug holster is available with options for pole mounting of dual EV plug, single EV plug and wall mounting of a single EV plug. Contact your local EVBox representative for details.

# **Installing** the communication module externally

**A GSM / UMTS link with the charging station is essential for the connected station to function.**
However, a good GSM/UMTS link cannot always be obtained in enclosed spaces (i.e., a closed or underground parking garage). In cases like this, the communication module should be positioned outside the charging station along with the GSM/UMTS/GPS antenna and connected to the charging station. The procedure is as follows:

**1.** Remove the communication module from the controller module to which it is fixed by pinching the top points of the white supports on which it rests using a pair of precision pliers.
**2.** Remove the GPS/GSM antenna from the charging stations frame.
**3.** Find a suitable point where the GSM signal is well received.
**4.** Install 4-pole plugs on the communication module and the controller. These plugs can be obtained separately.
**5.** Make the connection as shown below. A 4-core RS485 cable (SFTP Cat. 5 cable) should be used for this. The maximum distance between the communication module and the charging station is 300 feet. With large distances (>180 feet) it is necessary to install an external 12V power supply.
**6.** Install the communication module and antenna in a closed cabinet (NEMA-3R). An assembly set with all the materials needed for this (excl. cable and 12V adapter) is available as an option.



Charge Box 471011
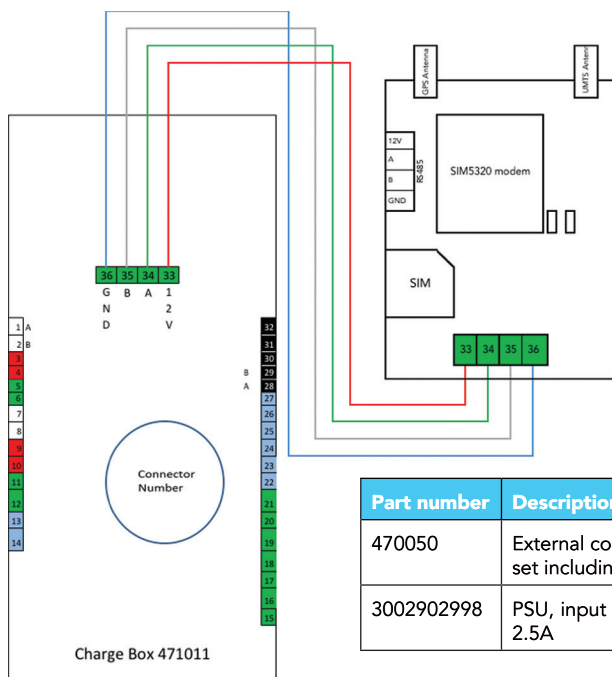
| Part number | Description |
|---|---|
| 470050 | External communication module set including IP54 cabinet |
| 3002902998 | PSU, input 110-240V output 12V, 2.5A |

# **Adding** a Satellite station to a Hub

To accommodate more charging ports, several charging stations (Satellites) can be linked to a charging station with a communication module (Hub) in what we call a Hub/Satellite configuration, thus forming a grid. The grid can support up to a total of 20 connectors. The advantages of the Hub/Satellite set-up are:

•       Administration of the charging stations is simpler (one charging station with several connectors).

•       For locations with a poor GSM link, only a single communication module has to be installed externally.

•       A smart grid can be established over all available connectors, thus optimizing power usage and enabling more electric vehicles to charge simultaneously without exceeding any power limitations.

Make sure your network operator supports charging stations with multiple connectors and simultaneous charge sessions.

The Satellite charging stations must be connected in a single chain (see illustration on page 32).

**1.** Use a black 2-pole plug on the charging station containing the communication module and a green 4-pole plug on the Satellite.

**2.** Make the connection shown on page 32. The network must be set up with a cable suited to the RS485 protocol (SFTP Cat. 5 cable). Use a single twisted pair for the serial connection to minimize EMI.

**3.** The maximum number of controllers that may be connected to a single communication module is 20, thus allowing a maximum of 20 EV's to charge simultaneously per configuration.

**4.** The network must be closed off with a terminal resistance of 120 Ω at the last Satellite station if the communication module (located in the Hub) controls more than 6 ports.

**5.** Star or T network configurations are not possible as reflections in the cable can occur.

⚠ For correct functioning of the EVBox (smart) grid, it is essential that you contact your network operator to adjust the power settings available on the grid.
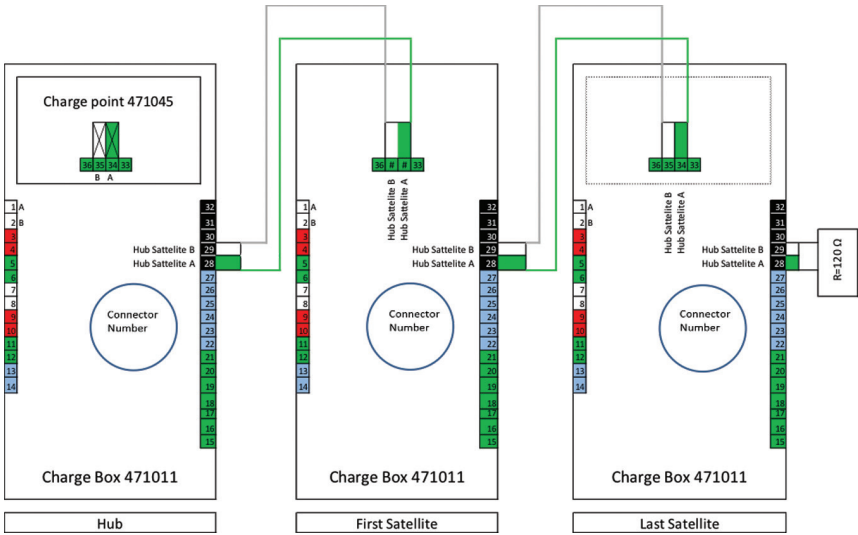
| Part number | Description |
|---|---|
| 470040 | Connector set for Hub/Satellite connection |
| 470041 | Set terminator Hub/Satellite connection |

# Troubleshooting

All installation works need to be done by a qualified electrician.

| Problem | Possible cause | Solution / Recommendation |
| --- | --- | --- |
| Charging station does not power on | • No power to charging station | • Check that the residual current device and circuit breaker in the meter cabinet are on<br>• Check that the power supply cable entering the charging station is live<br>• Turn the charging station off, wait 20+ seconds, and turn it on again |
| Residual current device prevents charging | • Grounding error in the charging station<br>• Special ground resistance needed for the vehicle<br>• Fault in the vehicle or defective charging cable | • Check electrical wiring for damage and replace any damaged wiring<br>• Check for moisture or condensation on electrical connections and dry the connections if necessary<br>• Replace the charging cable<br>• Measure the grounding resistance and compare it with the resistance required by the supplier of the vehicle |
| LED ring lights up red constantly | • Grounding fault | • Check grounding in charging station |
| One or more LED ring(s) continues to flash red in Hub / Satellite sequence | • Crossover in Hub / Satellite connection<br>• Charge port cannot be located | • Check RS485 cabling 1:1<br>• Press communication module firmly into position |
| LED ring continues to light up yellow | • Charging station waiting for communication from the vehicle<br>• Vehicle is charged<br>• Faulty charging cable<br>• Grounding resistance too high, with certain vehicles this must be < 50 Ohm<br>• Vehicle is on a timer | • Check that the charge plugs are properly inserted in the vehicle and charging station<br>• Check that the ground resistance is correct (measurement by electrician)<br>• Replace the charging cable (have fixed cable replaced by an electrician)<br>• Change the setting of the timer in the vehicle (check by user) |
| Red LED starts flashing immediately after the card is held against the reader | • Charging card is not authorized for charging at this charging station<br>• There is no communication with the back office | • Check that the charging card is registered correctly (check by user)<br>• Check the settings of your charging station in your online account (check by user)<br>• Check whether the communication module is in contact with the cellular network and has proper reception (check by network operator) |

# Warranty

**1.** EVBox warrants its Equipment against Errors and defects in materials and workmanship for thirty-six (36) months from the date of delivery, during which time it will use its best efforts to repair any Errors, if any. However, any such problems encountered out of any causes that are not attributable to EVBox shall be for Customer's risk and account. Contact help@evbox.com to report any defect or malfunction to your charging station(s).

**2.** At its sole discretion, EVBox will repair or replace any Errors and/or defective Equipment during the warranty period. EVBox may conduct warranty services at any location, at its sole discretion, and EVBox may apply temporary patches, solutions, and or restrictions relating to the Equipment as part of the warranty services.

**3.** The warranties hereunder do not cover faults or damages arising from faulty, careless, or improper treatment, faulty and unauthorized commission, improper storage or unloading and unauthorized modifications, incorrect use or misuse of Equipment, improper or defective environmental circumstances, or a failure caused by a product for which EVBox is not responsible. EVBox does not warrant that Equipment will operate without interruption or error.

**4.** Warranty claims are only allowed and EVBox will only be obligated to conduct warranty services, provided Customer is not breaching any of its obligations towards EVBox, and EVBox has been informed of the warranty claim in detail, within ten (10) days of the date on which the defect first occurred.

**5.** Unless stated by EVBox in writing otherwise, discounted or modified Equipment is not covered by any warranty.

**6.** TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EVBOX, ITS LICENSORS, THIRD PARTY SUPPLIERS, AND AFFILIATES HEREBY DISCLAIM ALL WARRANTIES, CONDITIONS, CLAIMS OR REPRESENTATIONS WITH RESPECT TO THE EVBOX EQUIPMENT AND/OR SERVICES, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY, QUALITY, NON-INFRINGEMENT, COMPATIBILITY, OR OF FITNESS FOR A PARTICULAR PURPOSE. NO ADVICE OR INFORMATION, WHETHER ORAL OR WRITTEN, OBTAINED FROM EVBOX OR ELSEWHERE WILL CREATE ANY WARRANTY OR CONDITION NOT EXPRESSLY STATED IN THESE TERMS AND CONDITIONS.

**7.** Customer warrants not to: (i) copy, modify, translate, or reverse engineer any portion of the Equipment and/or Services; (ii) use any robot, spider, another automated device, or manual process to monitor or copy the Software or parts thereof; (iii) reformat or frame any portion of the Software; (iv) interfere with the access of any other users of the Software; (v) transmit any viruses, worms, defects, Trojan horses or other items of a destructive nature through the Software; (vi) use the Software to violate the security of any computer network, crack passwords or security encryption codes; or (vii) use any device, software or routine that interferes with the proper working of the Software.

# **Declaration** of conformity

## CERTIFICATE OF COMPLIANCE

| | |
|---|---|
| **Certificate Number** | 20170327-E481618 |
| **Report Reference** | E481618- 20170320 |
| **Issue Date** | 2017-March-27 |

| | |
|---|---|
| **Issued to:** | EV-Box HQ |
| | Pedro de Medinalaan 31 |
| | 1086 XP Amsterdam NETHERLANDS |

| | |
|---|---|
| **This is to certify that representative samples of** | ELECTRIC VEHICLE SUPPLY EQUIPMENT |
| | USL, CNL – Level 2 Electric Vehicle Supply Equipment (EVSE), Permanently connected Series BusinessLine, Models B2320-65043, B2320-65063, B2320-65083, B2320-65093, B2320-45043, B2320-45063, B2320-45083, B2320-45093, B2323-65043, B2323-65063, B2323-65083, B2323-65093, B2323-45043, B2323-45063, B2323-45083, B2323-45093. |
| | Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate. |

| | |
|---|---|
| **Standard(s) for Safety:** | UL 2594- Electric Vehicle (EV) Supply Equipment CSA C22.2 No. 280-16- Electric Vehicle (EV) Supply Equipment |
| **Additional Information:** | See the UL Online Certifications Directory at www.ul.com/database for additional information |

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.
.

Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at www.ul.com/contactus

Page 1 of 1

# Post-installation form

**Fill out a separate post-installation form per site.**

Station ID(s): _____

Serial number(s): _____

Site name: _____

Site address: _____

Installer name: _____

Installer phone number: _____

Installer email: _____

**Note: Do not close the cover until the post-installation checklist below is completed.**

Power on only the Hub at first. For Satellites, follow "Assigning the correct connector IDs for each station/port" (see page 29).

**Checklist:**

☐ The LED ring is solid green

☐ All the connectors on the controller are securely in place

☐ The voltage at the terminal block has been measured and is above 180V

☐ The number on the charging unit has been called in order to commission the station and the unit has been successfully commissioned (networked only)

☐ The LED ring turned blue during a charge session

Installer signature: _____

Print name: _____

Date: _____

Once completed, please send a copy of this document to help@evbox.com in order to notify EVBox of proper installation for the listed charging station(s), and the date of the installation for warranty verification.

# Notes

EV-Box North America, Inc.
335 Madison Ave, 4th Floor
New York, NY 10017, USA
info@evbox.us
evbox.us

**You're all set!**
Let's charge.

**EVBOX**