EVBox
BusinessLine

Installation and user manual

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Let's get started.

EVBox BusinessLine

Installation and user manual

Contents

1. Introduction

Thank you for choosing the EVBox BusinessLine, our best-selling charging station with proven technology and reliability. Built to be connected and intelligent, EVBox BusinessLine makes going electric at your workplace or business easier than ever.

This Installation and User manual tells you how to install and use 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.

1.1. Compatibility

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.

1.2. Get in touch

If you have any suggestions how we can improve our products, or if you see an error, we'd love to hear from you. You can contact us by going to evbox.com/support.

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

1.3. 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. |

1.4. 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 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.

2. 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.

2.1. ⚡ 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.

2.2. ⚠ 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.

2.3. ⚠ 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.
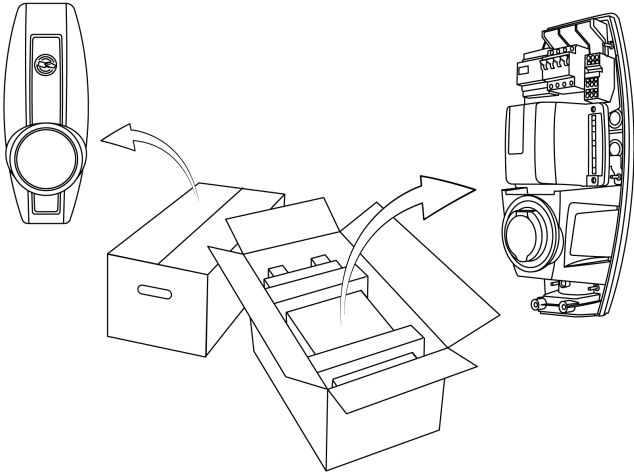
2.4. Transport and storage

- 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.

3. Components

3.1. Delivered components

The delivered components will depend on the model, type of installation, and the selected mounting option.

Table 2. Delivered components

1x EVBox BusinessLine unit (single or double socket, satellite and/or hub). **EVBox Connector set** (for hub-satellite installations, supplied with each satellite). **1x EVBox BusinessLine cover** (for a single socket). **2x EVBox BusinessLine covers** (for a double socket). **1x Hex key** (to open the cover of the unit). **1x Ground cable.** **1x Instructions folder** (Installation and User manual, security code and the station ID).	

3.2. Optional components

Depending on the installation, the following components can also be required. Contact your supplier to order the optional components.

Note: The installer is responsible supplying the power cables, data cables and any minor items required for the installation.

Table 3. Optional components

Component	Part number
EVBox Combipole (IN the ground)	290150
EVBox Combipole (ON the ground)	290305
EVBox Combipole (Wall mounted)	290600
EVBox Adapter Kit (to install a single station on a Combipole)	290165
EVBox Wall spacer (to install a single station on a wall)	290190
120 Ω resistor (to terminate the RS485 connector of last satellite charging station in a hub-satellite installation)	470041
EVBox Test Box with fixed cable (to test the functioning of the charging station)	462322

4. 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.

4.1. 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.
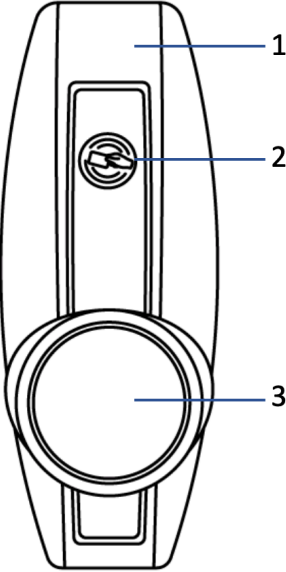
4.2. Connecting BusinessLine

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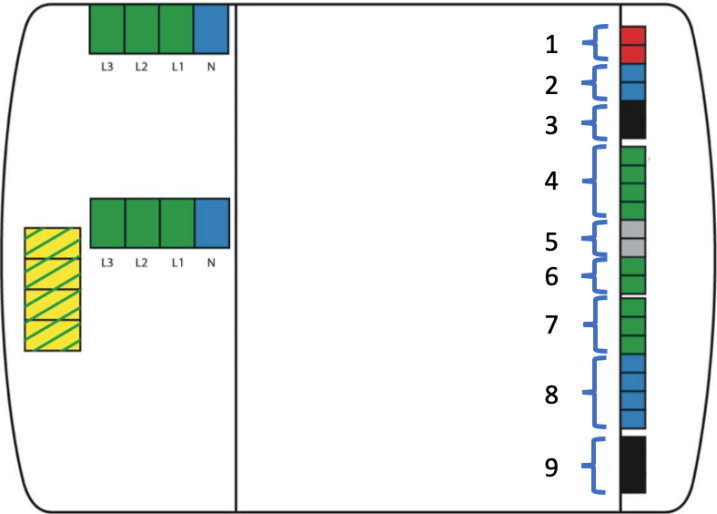
Connection	Description
Cellular data connection (2G, 3G and 4G)	Connection to backend systems for setup, maintenance and transactions (method 1).
Wi-Fi	Connection to backend systems for setup, maintenance and transactions (method 2).
Bluetooth	Local setup and access control for the charging stations.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

4.3. Description

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 charge card, key fob, or the Hey EVBox app. When used in Autostart mode, a registered charge card, key fob, or Hey EVBox 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.

4.4. 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

5. Technical specifications

Table 4.

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 mm^2.
Residual-current Circuit Breaker with Overcurrent protection (RCBO)	• Eaton FRBM4-C32/3N/003-A. • Eaton FRBM6-C16/3N/003-A. • Eaton FRBM6-C32/3N/003-A.
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 on page 39.
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: Combipole in or on the ground, or on a wall.
	Single: Combipole in or on the ground, or on a wall. Wall spacer for direct installation on a wall.
Standard colors	RAL 7016 (dark gray), RAL 9016 (white), RAL 5017 (blue).

6. Prepare for installation

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

6.1. Safety precautions

You must read and obey the safety precautions on page 0 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.

6.2. 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.

6.3. Choose location

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

6.4. 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 26.

6.5. 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 mm^2.

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 Combipole or Wall Adapter.

• There must be enough cable for it to move sufficiently during installation of a Combipole.

Note: The power line enters the station via the backplate for single stations, and through the Combipole 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	2x 32 A	2x 32 A
11 kW	3-phase	1x 32 A or 2x 16 A	2x 16 A

Power per connector	Connection	Input current	Output current
22 kW	3-phase	2x 32 A	2x 32 A

6.6. 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 EVBox at www.evbox.com/support so the support team can update the backend system data.
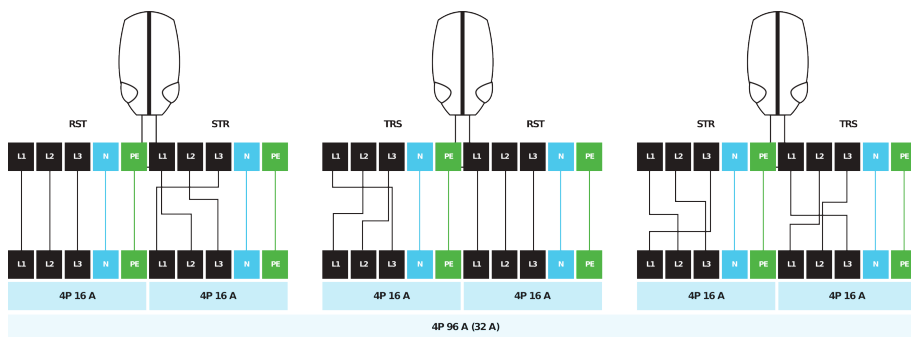
6.7. Power configuration for smart grid

For accurate performance of the smart grid, consult with the CPO (Charge Point Operator) 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).
- 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 CPO of the configuration. Use the EVBox Connect app to set-up your BusinessLine ready for connection to a network.

6.8. 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 Combipole set into the ground, a EVBox Combipole fixed to the floor, or on a Combipole fixed to a wall (see).

- The double charging station can be mounted directly onto a Combipole without additional parts or accessories.

- The single charging station is attached to a Combipole with the BusinessLine Adapter Kit. A separate installation manual is included.
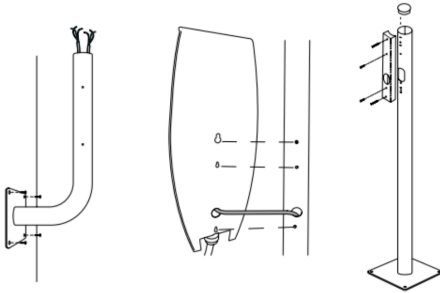

The EVBox Combipoles for wall mounting have the following requirements:

- The wall must be able to hold a load of at least 70 kg.
- Mount the Combipole onto a vertical surface so the bottom of the charging station is between 70 cm 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 Spacer fixed to a wall (see).

- 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.
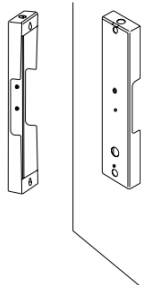
7. Install charging station

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.

⚠ **Warning:**

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.

Compatibility

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.
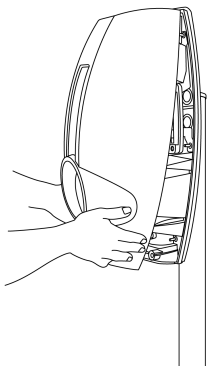
7.1. Remove covers

Remove the covers if they are installed on the charging station.

1. Find the two screws at the bottom of the charging station (four screws for the double BusinessLine).

2. Use the hex key (supplied) to remove the screws.
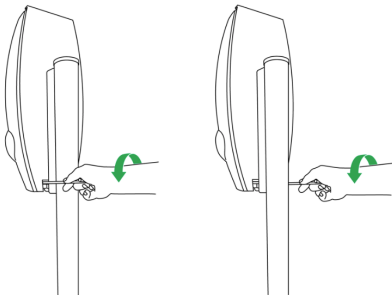
**3.** Open the cover from the bottom and lift it off the charging station.

4. Put the cover front side up in a place where it cannot get damaged.

7.2. Install station

1. Lift and install the charging station onto the Combipole or Wall Spacer.
When installing a double charging station on a Combipole, make sure that the charging station slides fully down the pole to rest on the internal stop inside the charging station.
When installing a single charging station on a Combipole or a Wall Spacer, route the power cable and the RS485 communication cable through the back plate.
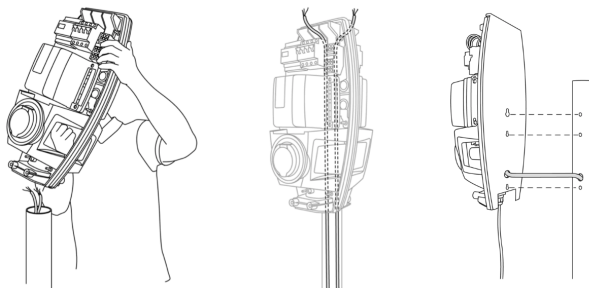

2. Route the power cable and the RS485 communication cable (when used for a satellite installation) from the Combipole or Wall Spacer to the top of the charging station.

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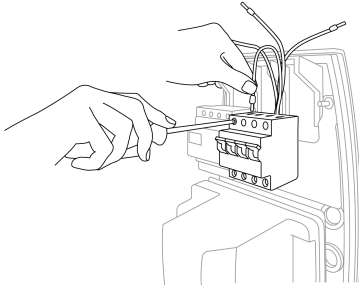

4. Secure the power supply cables with one or more cable ties.

5. For a charging station in a hub-satellite installation, connect the RS485 connectors to the controller (see <u>Configure Hub-Satellite on page 26</u>).

6. For a double station installed on a Combipole:

   a. Connect the ground cable (supplied) to the grounding point next to the circuit breaker (RCBO).
   b. Align the grounding point in the station with the pre-drilled grounding hole in the Combipole.
   c. Route the cable to the Combipole grounding point.
   d. Connect the ground cable to the grounding point with the M6 bolt and washer (supplied).
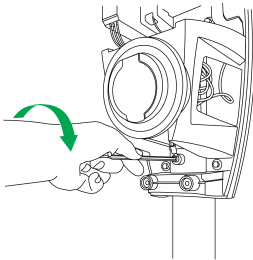
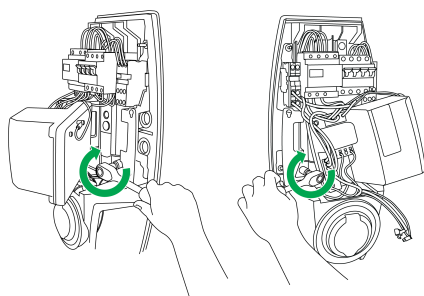e.   Disconnect the connectors from the right side of the controller.
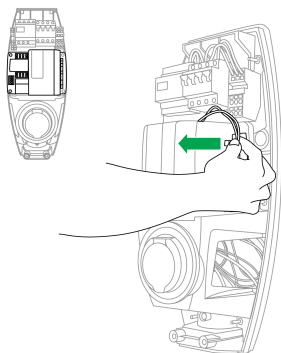
f.   Loosen but do not remove the bolts attaching the controller to the bracket.
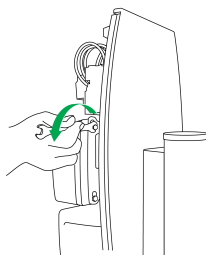
g. Remove the controller up to release the bolts from the slotted holes in the bracket. Move the controller to one side to access the Combipole clamps.
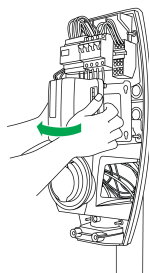
h. Tighten the clamps with a socket wrench to secure the charging station on the Combipole.

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

7. For a single station installed on a Combipole or a Wall Spacer:

a. Install the three bolts to secure the charging station to the Combipole or a Wall Spacer.

7.3. 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.
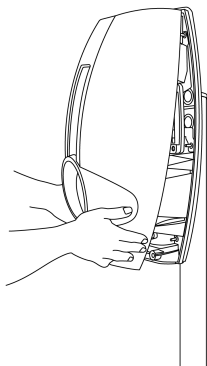
    d. Make sure no wires are trapped around the edge of the cover.
    e. Make sure the cover locks onto the frame and the rubber seals are in position to ensure protection against water and dirt.
    f. Tighten the bolts at the bottom of the cover using the 5 mm hex key (supplied).
      When the charging 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.
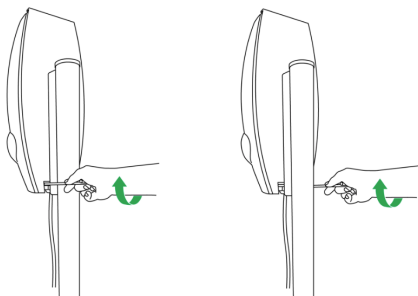
    g. For a double charging station install the second cover in the same way.

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.

7. After charging station activation, you can use the EVBox Test Box (see) to check the operation of each charge point.

8. 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.

8.1. 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 (see Components on page 7).
- 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 (see Components on page 7) 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
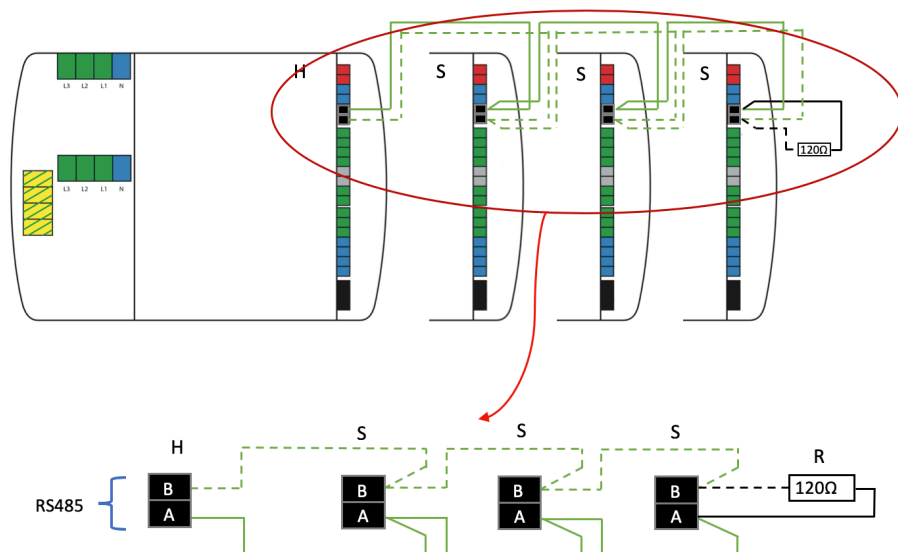
Key:

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

9. Activate BusinessLine

9.1. 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 CBC-MAC 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.

9.2. 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.

9.3. Register and connect BusinessLine

Your BusinessLine is installed and configured, and your installer has given you the Instructions Folder supplied with the BusinessLine charging station. The Instructions Folder contains the security code and the station ID that you need to register the BusinessLine so you can start using it.

1. Download the Hey EVBox app from Google Play Store or Apple App Store.

2. Log in to your account in the app.

3. If you don't have an account yet, create a new account in the app.

4. Register BusinessLine in the app by entering its station ID and security code.
   The station ID and the security code are in the supplied Instructions Folder. The station ID is also on the back of the hub charging station.

5. Follow the steps in the app to connect BusinessLine.

   Note: The charging station operates with a Wi-Fi or cellular connection. BusinessLine will always search for Wi-Fi but it will choose the cellular connection when Wi-Fi is not found.

6. To be able to start a charging session the user must have a charge card linked to a service operator.

   Note: If you need assistance with setting up BusinessLine, your mobile station management application or backend portal account, please contact your operator or service provider of this product for further support.

9.4. Set-up BusinessLine

Use the EVBox Connect app to set-up your BusinessLine ready for connection to a network. You can set-up the following features:

- Bluetooth pairing to a mobile device.
- Connect using Wi-Fi or cellular network.
- Autostart mode.
- Adjusting LED indicator ring brightness.

The EVBox Connect app also allows access to the following advanced configuration settings:

- Station reboot.
- Local whitelisting of charging cards.
- Minimum and maximum amperage settings.
- Charging Management Platform selection.

1. Download the EVBox Connect app from Google Play Store or Apple App Store.

2. Log in to your account in the app.

3. If you don't have an account yet, create a new account in the app.

4. Follow the steps in the app to pair your mobile device with BusinessLine.

5. Set-up BusinessLine to your requirements.

10. Using BusinessLine

10.1. Start charging with BusinessLine
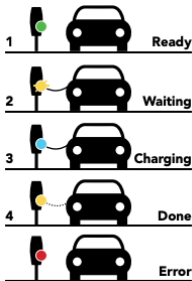
1. Plug your charging cable into your car and into the BusinessLine charging station.
   The LED ring shows green.

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 (see chapter Configure Hub-Satellite on page 26). 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.

10.2. 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.

10.3. LED indicator ring

Table 5. 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 34 in this manual for solutions. If you cannot solve the issue, contact your EVBox installer or supplier.

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.

Note:

When the charging station is installed, the LED indicator ring can be tested using the EVBox Test Box (see Components on page 7).

11. Troubleshooting

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.evbox.com/support for further help from our service pages and 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.
Charging station does not emit clear tone when switch is set to on.	- Small plugs on the controller are not fully pushed in. 230V connections are not connected correctly.	- Check that the circuit breaker (RCBO) is on. - Check for 230 V on the input terminals of the controller. - Ensure all wire and plug connections are secure, especially on the controller.

Problem	Possible cause	Solution
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 resistence 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.

Problem	Possible cause	Solution
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.

Problem	Possible cause	Solution
Charging station does not start charging. LED ring flashes green for 30 seconds, then flashes red 10 times. LED ring changes to green or goes off.	No response from the backend portal account.	Use the card again to start the charging. If the problem remains, contact your operator or service 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.)

Problem	Possible cause	Solution
	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. • Remove the cover then manually turn the lever on the plug locking mechanism upwards to the unlock position. • Check if the charging station internal wiring harness blocks the plug locking mechanism.

12. Declaration of conformity

The EVBox BusinessLine charging station was developed, manufactured, tested, and supplied in accordance with the relevant directives, regulations and standards for safety, EMC and environmental compatibility.

EVBox declares that the EVBox BusinessLine charging station is manufactured and delivered in accordance with the following directives and regulations:

- EN/IEC 61851-1 (2017)

- EN/IEC 61851-21-2 (2018)

- EN/IEC 61000-32 (2014)

- EN/IEC 61000-3-3 (2013)

- EN 301 489-1 V2.2.0

- EN 301 489-3 V2.1.1

- EN 301 489-17 V3.2.0

- EN 301 489-52 V1.1.0

- EN 301 908-1 V11.1.1

- EN 301 511 V12.5.1

- EN 300 330 V2.1.1

- EN 300 328 V2.1.1

- EN 301 893 V2.1.1

- EN 300 220-1 V3.1.1

- EN 300 220-2 V3.1.1

The full CE Declaration of Conformity is available from www.evbox.com.

I'm all set!
Let's charge.