

# EV Charger

## Type 2 socket, 7.4kW

EVS7G, EVS7GG, EVS7GGR



### Tools needed:

4mm Hex bit/allen key; PZ 2 screwdriver; suitable drill bit and fixings

### BOX CONTENT

- EV charger
- Decorative trim
- Installation template
- Accessories pack containing:
  - » Power connector
  - » Cord grip and screws
  - » M25 gland
  - » 25mm blanking plug
  - » Fixing screw caps
  - » Assembly screws

### IMPORTANT NOTICE

To commission your charger and register for the 3 year warranty, please visit: [www.syncev.co.uk/portal/login](http://www.syncev.co.uk/portal/login) or use the QR code.



3 year warranty available as long as charger installation is registered, otherwise standard warranty is for a period of 1 year.

### INTRODUCTION

This guide is intended for use by competent electrical installers to explain basic requirements and options to be considered when installed a SyncEV BG Charger. The unit is designed for installations inside or outside, the advanced safety technology we have built into the unit ensures its safe usage. This guide provides information to assist when installing the EVS7 charger and should not be used with other EV chargers.



### IDENTIFICATION LABEL



## SAFETY INFORMATION

**Warning:** The supplied SyncEV BG charger is manufactured to be safe without risk provide they are installed correctly, used, and maintained in accordance with the manufacturers recommendations and installed by a competent electrical installer in accordance with national and local regulations and legislation applicable at the time of installation, eg: BS7671:2018 amendment 2.

The single phase EV charger should be connected to a 230V/240V nominal AC supply. The supply should run from a dedicated 40A circuit breaker. We recommend the use of a Type B curve circuit breakers. The EV charger features an integral 30mA type-A RCD with 6mA DC leakage detection and therefore an external RCD is not usually required:

1. For cables without earthed metallic covering installed in walls or partitions at a depth of less than 50mm and also within walls and partitions with metal parts, and not protected by steel conduit or similar then RCD protection is required. This can be achieved by using the BG IP65 EV protection enclosure (CFEV1A) when mounted next to the existing consumer unit as it includes a double pole 40A 30mA Type A RCD device to protect the circuit. This can be used if the cable has no mechanical protection where it passes through walls and partitions and if the cable is buried within the ground before reaching the EV charger. This will be in compliance with the current BS7671 Amendment 2 Wiring Regulations.

2. If the cable is clipped directly to the surface of a wall and does not pass through a wall or partition to the EV charger then a standard B type 40A MCB may be installed into the Consumer unit, however RCD protection may be required for other reasons such as if it forms part of a TT system and the earth fault loop impedance values cannot be met. This will be in compliance with the current BS7671 Amendment 2 Wiring Regulations.

To conform with BS 7671, on occasions a double pole MCB/RCD or other means of isolation may be required.

**Important note:** A DC Leakage fault in the vehicle may “blind” a type “AC” RCD and render it ineffective, never feed any EVSE from an upstream Type “AC” RCD.

## EARTHING REQUIREMENTS

The supplied EV charger features an on-board safety monitoring system to detect low or high voltage supplies and potential earth-neutral faults, this in accordance with regulation 722.411.4.1 (iv) of BS7671 2018 (Compliant on single phase supplies only). If such a condition is encountered the charge cycle is ended or prevented and the EV charger indicator goes red and effectively becomes a double insulated (class II) device. The vehicle becomes isolated from incoming supply and poses no risk to touch. This feature removes the requirement for an earth electrode where it may be ineffective or introduce further risk.

The EV charger may be connected directly to a TN-C-S (PME) earthing system without any special arrangements. It remains the responsibility of the installer to conduct a risk assessment of the immediate area to a range of 10 meters (equipotential zone) to ensure no other conductive metal fixings pose risks (mixture of TT/TN-S and TN-C-S), this is important where cable length may enable charging inside or outside of a building/ garage where the vehicle is within touch distance. Where certain conditions dictate an earth electrode must be used it shall be independent from the distributors earth system with no direct interconnection (the incoming supply SWA protective earth should be isolated from the housing and/ or earth electrode). The electrical installer shall install a suitable electrode complete with termination housing and covers where appropriate, warning labels should be visible and close to the unconnected SWA protective earth eg inside the charger.

The earth connection shall be made from the electrode to the charger via copper conductor earth wire of an appropriate CSA for the installation. The earth wire shall be installed in conduit where there is a risk of mechanical damage or UV exposure. Additional note: SyncEV BG recommend Earth electrode impedance to be <100 ohms.

## SURGE PROTECTION

Guidance on requirements for surge protection devices given in BS7671: section 443.

The EV charger is protected against transient over voltages (+/-2kV Line-Earth and +/-1kV Line-Line as a requirement of EN 61000-6-1), a direct lightning strike carries a current of 30~ 200kA the EV charger’s internal protection would provide little or no protection in such an event, likewise nor would an SPD rated less than 30kA. If life support equipment or business operations could be affected by a lightning strike central SPD protection is advised if it does not already exist.

The guidance on risk calculation in section 443.5 of BS7671 in most cases is not possible due to unknown location of any SPD already fitted, length of cables to calculate LP etc, it is therefore recommended a common sense approach is used on choice of SPD (or if required).

## ISOLATION AND SWITCHING FOR SAFETY AND MAINTENANCE

To ensure that the EV charger can be “turned off” to enhance security and enable maintenance activities, a double pole isolator (or DP RCD or RCBO) suitably rated must be installed within the customer’s property. An isolator switch is a mandatory requirement for “new builds”, but optional for existing dwellings (at customer’s request), the switch should be mounted at a height of between 500mm and 1500mm above finished floor level to comply with regulations. The switch should be rated at 45 Amps. All installations must comply to BS7671: 2018 regulations

## INSTALLATION

The EV charger is suitable for installation inside and outside on a solid wall or structure. The installer should consult with the building owner to establish their preferred installation location. This should take into consideration the length of charging cable and risk of vehicle impact etc.

It is recommended the charger is installed at a height of 500mm-1500mm as per building regulations BS8300:2018.

Ensure suitable fixings are used depending on the mounting surface. To avoid unnecessary dust inside the enclosure, it is recommended to use the included fixing hole template drill the surface, before fitting the enclosure.

Ensure installation wall has been checked for electric cabling or pipework with a suitable detector.

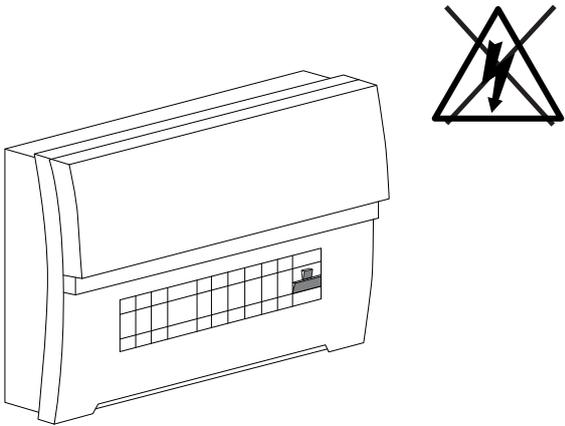
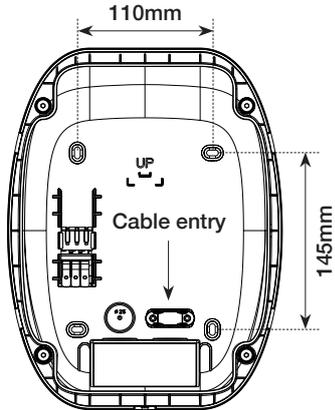
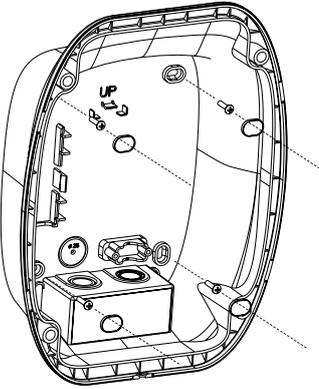
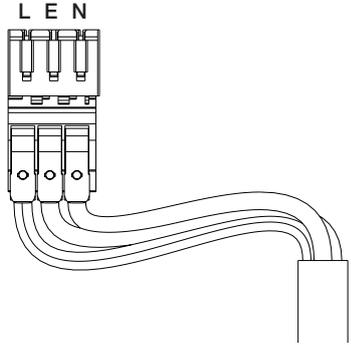
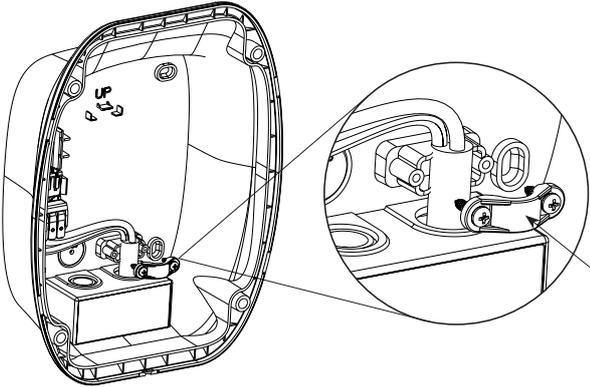
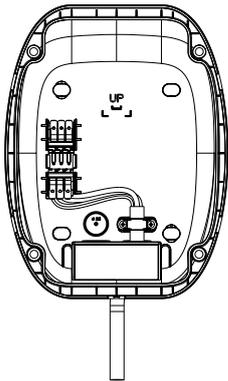
**NOTE:** if any groundworks are required e.g cable trenching or earth electrode fitment, it is advisable to check if underground services could be present before commencement. Plans may be available at: [www.linsearchbeforeudig.co.uk](http://www.linsearchbeforeudig.co.uk) (free to domestic users)

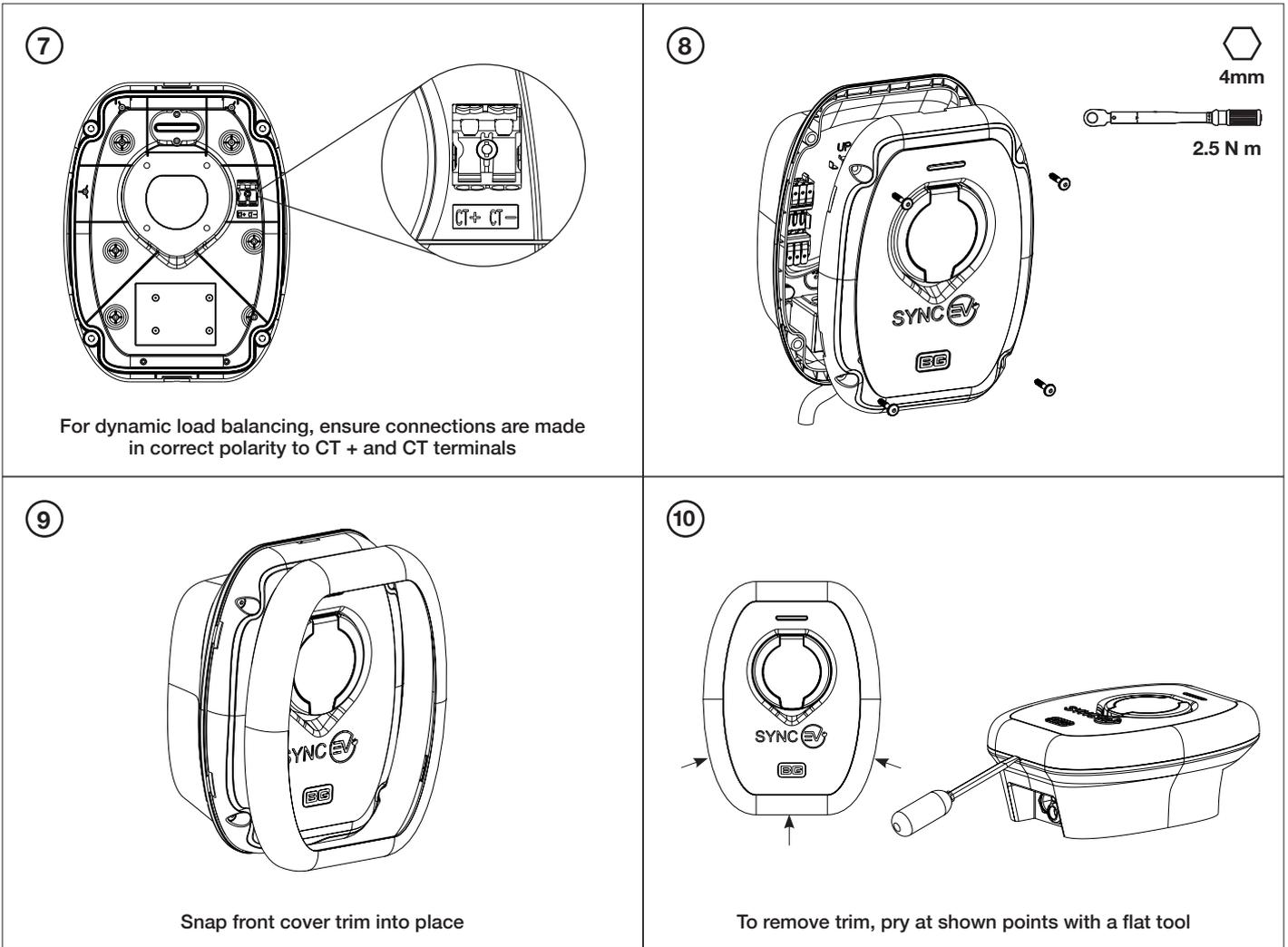
The EVcharger is suitable for bottom or rear cable entry, if using rear cable entry ensure the blanking plug supplied is fitted to the open bottom cable entry hole. If using SWA cable the included 25mm compression gland is NOT suitable, and an alternative gland will be required. Do not drill alternative cable entries into the charger housing.

SyncEV BG recommends using EV-Ultra™ – Power & Data Combined cable on installs that require a CT clamp to use the chargers dynamic load management capabilities. Please see: [www.doncastercables.com/uploads/EV-Ultra\\_Datasheet.pdf](http://www.doncastercables.com/uploads/EV-Ultra_Datasheet.pdf)

If Load Balancing is required, we suggest of the SyncEV BG CT clamp, EVA120CT1. This should be fitted around the incoming power to the main fuse and the correct max load (A) to be entered during set up and installation steps.

All of the cables that are to be connected into the supply connector should have their insulation stripped back 18-20mm. Connectors supplied are suitable for cables of 4-6mm<sup>2</sup> and suitable for solid and stranded cores.

<p>①</p> 	<p>②</p>  <p>Use included hole template to drill fixing holes</p>
<p>③</p>  <p>Ensure the supplied caps are fitted over installation screws to maintain IP rating</p>	<p>④</p>  <p>Ensure correct polarity when making incoming power connections</p>
<p>⑤</p>  <p>Ensure supplied cord grip is fitted on incoming power cable if using bottom cable entry location.</p>	<p>⑥</p>  <p>Ensure connector is fully inserted, then clip power connector into the base.</p>



## FINAL ELECTRICAL TESTING

To meet the BS7671:2018 (18th edition) requirements for testing of an electrical installation, the following tests and checks shall be performed by a competent electrical installer before during and after a SyncEV BG charger is installed:

- A visual inspection of the installation including the existing electrical installation.
- Verification of the characteristics of the electrical supply at the origin of the installation to confirm the supply is suitable for the additional load.
- A test to confirm the continuity of the circuit protective conductors.
- A test to confirm the integrity of the circuit insulation resistance.
- A test to confirm the polarity of the installation is correct.

- Where applicable a test to confirm the earth electrode resistance is within acceptable tolerances.  
(or)
- An earth loop impedance test.
- A test of the mechanical operation of residual current devices (RCD's).
- A test to confirm the operation of residual current devices (RCD's) is within stipulated time scales (at the rated current and at five times the rated current operating current).
- A test or calculated measurement of the prospective fault current.
- A verification of the functional operation of the EV charger.

**An electrical installation certificate must be completed.**

**Ensure electrical testing is done before EV charger commissioning and network set up is performed.**

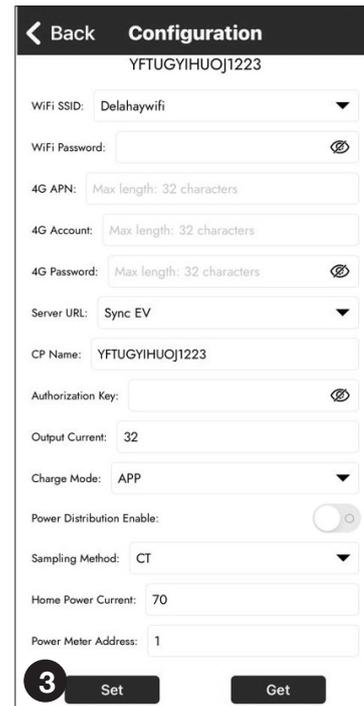
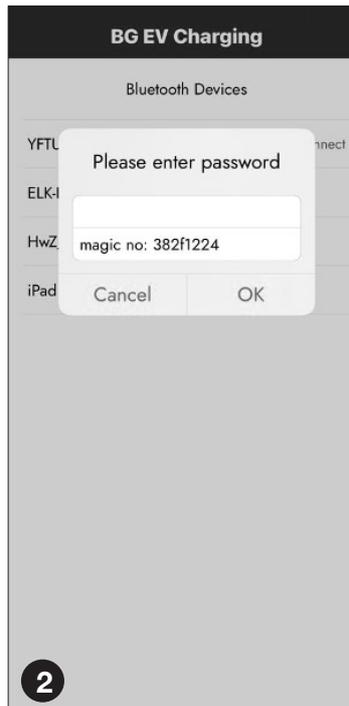
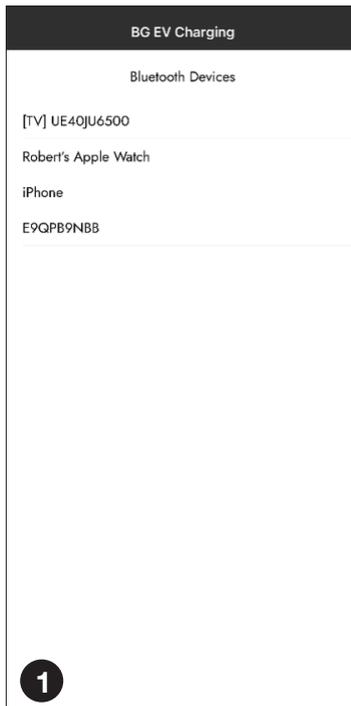
## WI-FI CONNECTION GUIDE

This is the installers responsibility and must be done to complete the installation.

We recommend the WiFi router is set to only 2.4GHz band during set up to reduce the risk of possible issues during set up. Once set up the router can then be restored to both 2.4GHz and 5GHz bands.

Upon powering the Sync EV BG charger, the status indicator light will show Yellow. This indicates that the health of the charging unit is good but there is no connection to the Sync EV Network.

The BG EV Charging installer app can be downloaded via the installer portal on [www.syncev.co.uk](http://www.syncev.co.uk)



1. Connect to the EV charger through the BG EV installer application. The app will scan for available Bluetooth devices and select the one matching the ChargerID Code on the EV charger identification label.

2. The EV charger will then request the password, The default password is also on the identification label. We recommend this is changed during set up and noted on the identification label.

3. Once this is entered the app will then show the full configuration page. Scan and select the required Wifi SSID, and enter the correct password. This screen will also allow the configuration of charge mode and if load balancing (Power distribution) is required.

For Charge Mode, the default is APP which requires a confirmation within the SYNC EV app to start charging, this can be changed to a Plug and Charge function which will charge without secondary confirmation.

For load balancing, if a CT clamp is fitted this should be enabled and set to the correct home current limit. This should be the same or less than the main fuse rating. With this setting, the EV charger will reduce its charging rate to limit the total home load to be under the limit. If the available current is under the minimum of 6 Amps the EV charger will pause the charging session.

**When all the correct functions are entered, select Set to upload settings. The EV charger will beep to confirm.**

After 15 seconds, the Yellow Indicator should turn Blue to confirm connection to network and app server. If the EV charger continues to show yellow, the charger should be power cycled and reconnected via the app to check correct settings.

### GSM and RFID enabled charging points

For detailed information, please visit the installer portal for set up and configuration of these features.

## SET UP AND COMMISSIONING



### SYNC EV APP

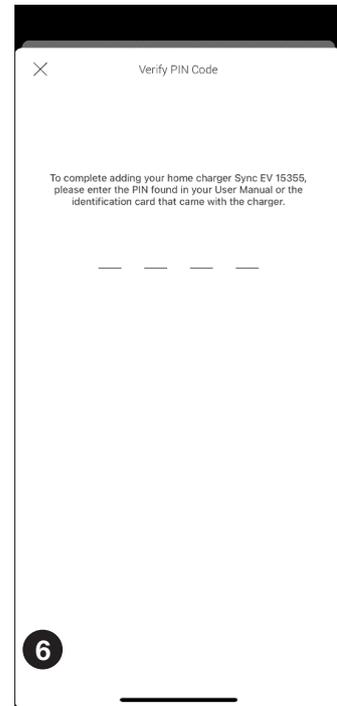
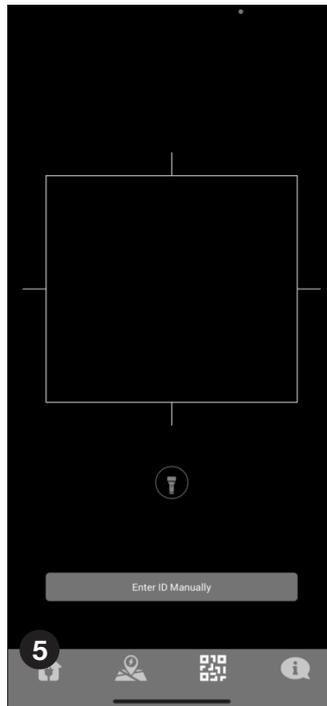
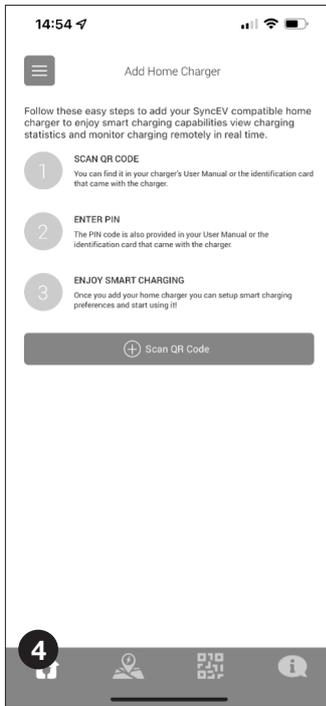
You will now need to inform your customer to download the SYNC EV Application



[apps.apple.com/gb/app/sync-ev/id1528884639](https://apps.apple.com/gb/app/sync-ev/id1528884639)



[play.google.com/store/apps/details?id=syncev.co.uk&hl=en\\_GB&gl=GB](https://play.google.com/store/apps/details?id=syncev.co.uk&hl=en_GB&gl=GB)



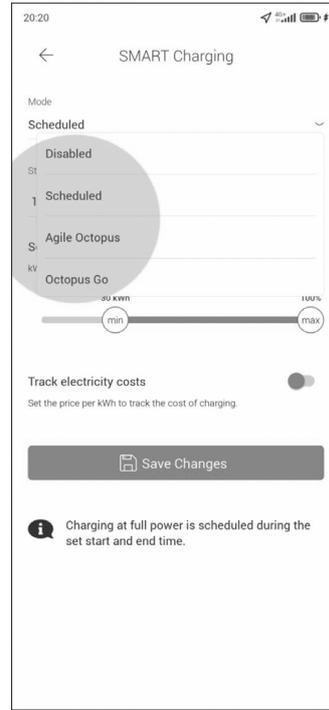
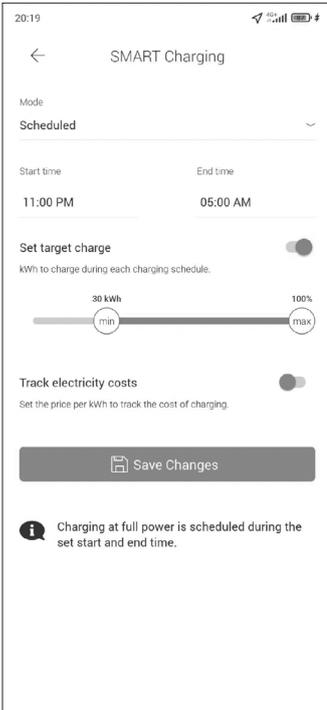
1. Once downloaded, please register an account, the chargers QR code ID and Pin code can be found on the charge point identification label on the EV charger and enclosed on the cover of the installation and user guide.
2. Scan the QR code within the app to register this EV charger to the customers account.
3. Once scanned, enter the PIN code to confirm set up.

**NOTE:** The final step during the sign up process presents you with an option to input payment card details for Sync EV future public charging network. This is not mandatory and it can be skipped by pressing the “X” in the top left corner.

## APP FEATURES

### Live status and charging state of the charger

Authentication, to prevent unwanted use of the charge point, or plug and charge modes



### Schedule Charging

Enables you to set start and end times to match your off-peak electricity tariffs or preference, with optional minimum and maximum kWh charge limits.

### Enable Smart Charging with Agile Octopus or Octopus Go

Agile Octopus (requires compatible tariff) to optimise your charging schedule based on the current price per kWh, to only charge when the price is below the set limit.

Octopus Go (requires compatible tariff) to have the charging schedules during the times with discounted price per kWh

Power management and configurations to restrict charge rates from 6A to 32A.

## TROUBLESHOOTING

For further information, or to refer to our FAQs, please visit our website – [www.synccev.co.uk](http://www.synccev.co.uk)

The status of the EV charger can be identified by referencing the colour shown on the LED indicator

- **SOLID BLUE** – Standby – Charger has power and is connected to the Sync EV network
- **FLASHING GREEN** – Charger is connected but not charging, awaiting confirmation of charge in APP or scheduled start time
- **SOLID GREEN** – Charger is active and Charging
- **SOLID YELLOW** – Charger is offline from network, check local network is active and Wi-Fi is working on the 2.4Ghz band.
- **SOLID RED** – Indicates the charger is in fault mode and has stopped charging for users safety.

#### Potential causes:

- » Internal RCD has tripped
- » Vehicle fault
- » Under or over suitable charging voltage

Remove connection to EV vehicle and reset power to the EV charger.

## ENVIRONMENTAL PROTECTION



This symbol is known as the “Crossed-out Wheelie Bin Symbol”. When this symbol is marked on a product or battery, it means that it should not be disposed of with your general household waste. Some chemicals contained within electrical/electronic products or batteries can be harmful to health and the environment. Only dispose of electrical/electronic/battery items in separate collection schemes, which cater for the recovery and recycling of materials contained within. Your co-operation is vital to ensure the success of these schemes and for the protection of the environment.

## GUARANTEE

SyncEV BG products are guaranteed against faulty materials and workmanship for a period of 3 years from date of delivery: products will be repaired or (at BG Electrical’s discretion) replacements will be supplied or (at BG Electrical’s discretion) a credit note will be issued. This guarantee is subject to BG Electrical’s conditions of sale and in particular to the following conditions being met:

1. Notification of any defect is given to BG Electrical as soon as reasonably practicable after becoming apparent, and the products then returned to BG Electrical.
2. The products have only been operated under normal operating conditions and have only been subject to normal use.
3. No work (other than normal and proper maintenance) has been carried out to the products without BG Electrical’s prior written consent.
4. The products have been assembled, or incorporated into other goods, by a qualified and recognised electrician and only in accordance with any instructions issued by BG Electrical.
5. The defect has not arisen from an item manufactured or supplied by a person other than BG Electrical.
6. 3 year warranty available as long as charger installation is registered, otherwise standard warranty is for a period of 1 year.

## TECHNICAL

<b>Voltage</b>	220-240V ac
<b>Frequency</b>	50-60Hz
<b>Rating</b>	6-32A output
<b>Wi-Fi</b>	2.4GHz Band b/g/n/e/i
<b>RCD protection</b>	6mA DC and 30mA AC Type A
<b>Wi-Fi security</b>	WPA/WPA2/WPA2-Enterprise/WPS
<b>Bluetooth</b>	4.2 BR/EDR and BLE RFID - Supports ISO 14443, suitable for M1 cards

## STANDARDS

<b>Approval standard</b>	IEC 61851-1
<b>Communication protocol</b>	OCPP1.6J

If you have any further technical assistance you can get in touch with our Support Team:

[support@syncev.co.uk](mailto:support@syncev.co.uk)

Luceco PLC – Stafford Park 1, Telford, TF3 3BD, England | (EU) Luceco SE – C/ Bobinadora 1-5, 08302 Mataro, Spain