



Your Vehicle- to-Grid Charger

This guide is for the following models:

170911A101 V2G














POWERED BY
KALUZA

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Important safety notes

Safety warnings

-  **WARNING:** Vehicle-to-Grid Charger installation must only be performed by a certified electrician who has been trained in dealing with high voltage electricity.
-  **WARNING:** Use the Vehicle-to-Grid Charger only as directed.
-  **WARNING:** Do not use the Vehicle-to-Grid Charger if it is defective, appears broken, cracked, or fails to operate or is otherwise damaged. In this case, you must report the damage immediately to your installer, quoting the serial number.
-  **WARNING:** Do not insert any foreign objects into the Vehicle-to-Grid Charger.
-  **WARNING:** Do not expose the Vehicle-to-Grid Charger or its components to open flames.
-  **WARNING:** Do not expose the Vehicle-to-Grid Charger to heating equipment.
-  **WARNING:** Do not immerse the Vehicle-to-Grid Charger or its components in water or other fluids.
-  **WARNING:** Do not use cleaning solvents to clean the Vehicle-to-Grid Charger, or expose the Vehicle-to-Grid Charger to flammable or harsh chemicals or vapours.
-  **WARNING:** the Vehicle-to-Grid Charger is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge unless they have been given supervision or instruction concerning use of the device by a person responsible for their safety.
-  **WARNING:** This product is classified as Electromagnetic Compatibility (“EMC”) Class A. In a domestic environment this product may cause radio interference, in which case the user may be required to take appropriate measures. If it appears that the Vehicle-to-Grid Charger is causing radio interference, please contact hello@ovoenergy.com.
-  Users with implanted cardiac pacemakers or implanted cardiac defibrillators should not stand close to the unit during charging.

Environmental conditions



WARNING: Install the Vehicle-to-Grid Charger in a location that mitigates damage from flooding.



WARNING: Operating or storing the Vehicle-to-Grid Charger in temperatures outside its specified range might cause damage to the Vehicle-to-Grid Charger.



WARNING: Do not spray the Vehicle-to-Grid Charger with a pressure washer or other high-pressure water source.



WARNING: Ensure that no water sources are above or near the Vehicle-to-Grid Charger, such as taps or sprinklers.



WARNING: Ensure that snow does not accumulate around the Vehicle-to-Grid Charger.

Introduction

What's covered in this guide

This guide explains how to get started with your Vehicle-to-Grid Charger and the Kaluza app. It also contains some troubleshooting tips and important safety information.

It's important that you read this guide carefully before getting started, so you're completely familiar with all the features and safety advice.

About your Vehicle-to-Grid Charger

The Vehicle-to-Grid Charger is a 6kW bi-directional electric vehicle (EV) charger designed for charging at home. It has plenty of clever features built in:



Bi-directional charging:

Export electricity back to the grid from your EV battery.



Earn credits on your energy bill:

You could save money on your energy bills with export credits when charging on a plan from OVO Energy.



Companion app:

See your charging history, set charging schedules and activate Boost charging mode via the Kaluza app.



Reliable charging:

Designed with a Home Alone mode to charge your car at full power even if your charger goes offline.



Grid services:

Working alongside other chargers connected to the Kaluza platform, the Vehicle-to-Grid Charger can offer flexibility services to the National Grid and local electricity networks.

Other features:

- Vehicle-to-Grid Charger is a mode 4 charging solution, compatible with all Nissan LEAF cars that are Vehicle-to-Home or Vehicle-to-Grid enabled and comply with EN61851 and CHAdeMO standards.
- Includes a 5-metre CHAdeMO tethered cable.
- Compatible with any single rate energy plan from OVO Energy.
- Suitable for installation on external walls or internal walls of external buildings such as garages.
- Remote connectivity, either via hard wiring into the home broadband network or through power-line communications.

Using your Vehicle-to-Grid Charger

Getting started

To start charging, plug the charging gun into the CHAdeMO port on your vehicle. Then, simply press the “on/off” button on the front panel of your charger. The panel LEDs will flash green during the CHAdeMO connection process, and then turn white once the connection is complete. A red LED on the CHAdeMO gun will come on to indicate that it is locked in place, and your vehicle is now ready to charge. See your Kaluza app or read Table 1 below for information about how your vehicle is charging.

Kaluza mode

Kaluza mode is the default charging mode, intelligently charging your vehicle and having it ready for the road by the time you’ve scheduled in the app. Kaluza mode also chooses the best times to export from your vehicle’s battery to maximise the savings on your energy bills.



Unplugging your vehicle

When you’re ready to unplug your car and drive off, simply press the “on/off” button again to release the CHAdeMO cable. Wait a moment for the gun to disconnect (the red light will turn off). Replace the charging gun in its holster, and you’re good to go!

Other charging modes

Boost mode

To charge at full power immediately, press the ‘Boost’ button on the charger or in the Kaluza app to activate Boost Mode.

Home Alone mode

The charger will automatically switch to ‘Home Alone mode’ and charge your EV on full power if disconnected from the internet and the Kaluza platform. When the charger reconnects to the internet, it’ll switch back to Kaluza mode unless Boost mode has been activated.

For more information on all the charging modes available, check the ‘[Help](#)’ section in the Kaluza app.

Kaluza app

The Kaluza app helps you to get the most out of your Vehicle-to-Grid Charger. The app is available through your web browser and works on all major platforms (Android, iOS, Windows Phone, BlackBerry and more). You can launch the app by visiting <https://app.kaluza.com>.

During the installation of your Vehicle-to-Grid Charger, you'll receive an invitation to the email address you gave during sign up, containing a link to create your password. Your email address is your username.

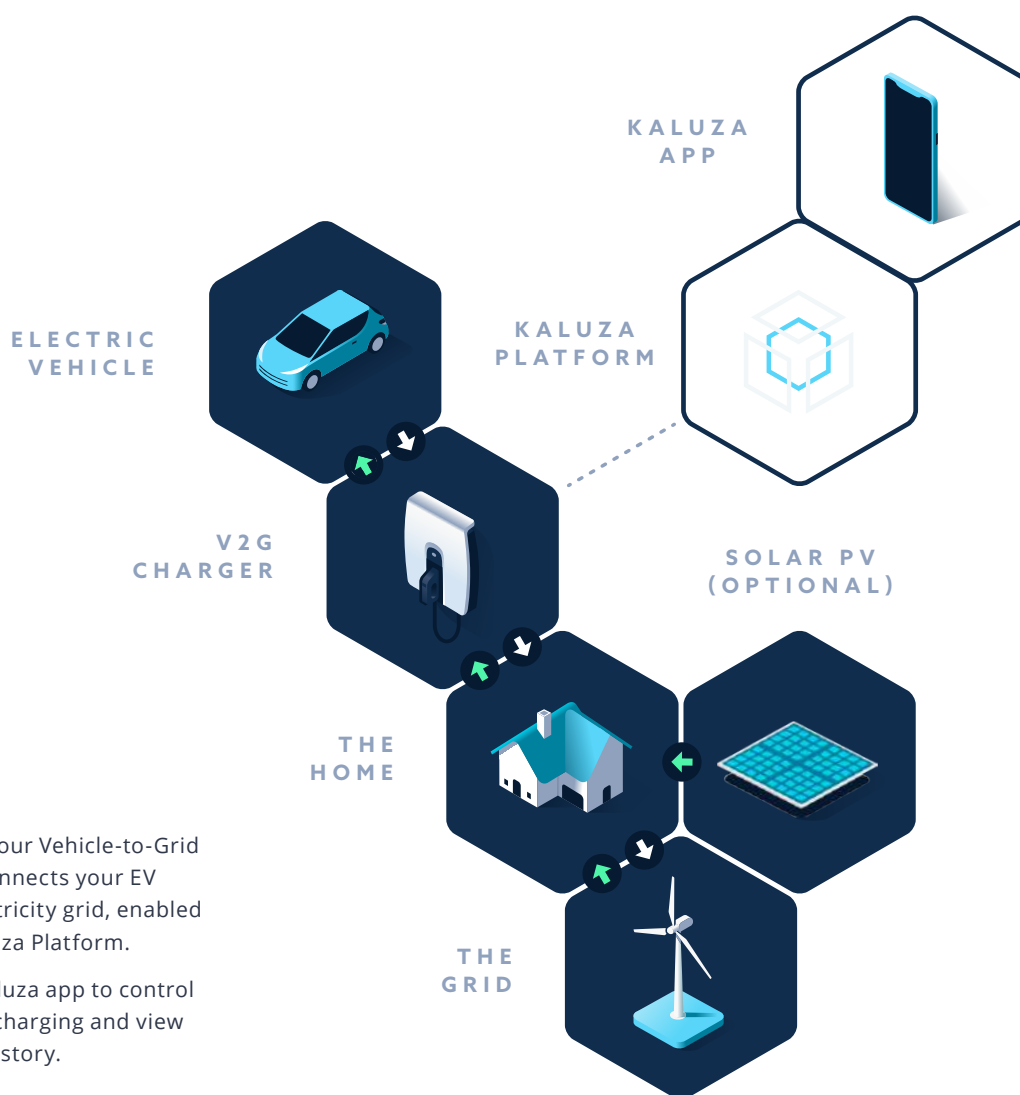


Figure 1. Your Vehicle-to-Grid Charger connects your EV to the electricity grid, enabled by the Kaluza Platform.

Use the Kaluza app to control your car's charging and view charging history.

App features

Complete visibility

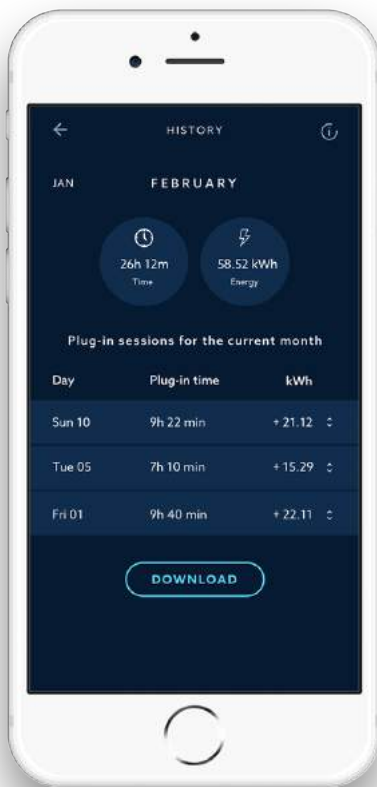
See the charging status of your Vehicle-to-Grid Charger anytime, anywhere.

Boost mode

Need your EV right now? Use Boost mode to get the fastest charge possible, through the app or the button on your charger.

Analytics

See a complete history of your charging, how much energy you've used and exported in kWhs, and the charging duration.



For more info on charging modes and settings for your Vehicle-to-Grid Charger, see the 'Help' section of the app.

Getting started with the Kaluza app

To start using the app, sign in using your email address and the password you created. After you sign in for the first time, the app will guide you through the features of the Vehicle-to-Grid Charger and how to use them.

Charging schedule

To set up your charging schedule, simply select the time you'd like your vehicle to be ready by each day. When the charger is in Kaluza mode, it'll make sure your vehicle is ready to drive by these times, by combining your schedule with data such as the price of energy and the historical performance of your vehicle's battery to decide the optimum way to charge.

Exporting to the grid

The charger will automatically export to the grid at peak times, usually between 4pm and 7pm. To maximise the returns from exporting to the grid, make sure your vehicle is plugged in between these times.

Plans changed?

If you need to hit the road sooner than your scheduled ready time, you can use Boost mode to charge your EV at full power.

Troubleshooting

Servicing and maintenance

If you run into any problems with your Vehicle-to-Grid Charger, please don't try to repair it yourself. Repair of the Vehicle-to-Grid Charger should only be carried out by the manufacturer or their approved installation partners.

In the case that any system safety components (such as a breaker, fuse, limit cut out, enclosure or grounding equipment) fails completely or partially, maintenance or replacement of the Vehicle-to-Grid Charger may be required.

Support

We're sure you'll enjoy charging with the Vehicle-to-Grid Charger, but if you do experience any issues or require technical support, please get in touch with OVO Energy and we'll do everything we can to help.

To report an issue, please call us on **0330 303 5063** Monday-Friday 8am-6pm or email hello@ovoenergy.com.

Please be prepared to provide the date of installation and a brief description of the issue.

Emergency charging connector quick release

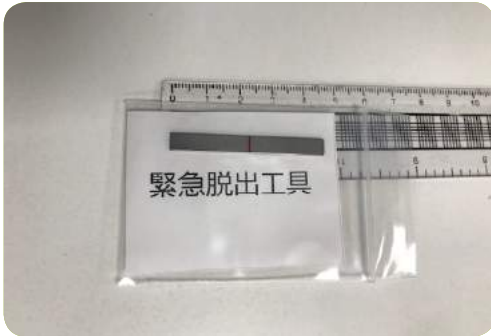
The CHAdeMO charging gun locks into place via an electric solenoid lock. Normally, this should be released by pressing the "on/off" button on the charger. In the unlikely event that the electric solenoid lock should stick, please follow the instructions below to detach the charging gun.



CAUTION: Power to your Vehicle-to-Grid Charger must be disconnected before performing the quick release. If in doubt, set the relevant switch in your fuse box to "off". Please take care not to scratch or damage your vehicle during the following process.

Detaching Tool

The Detaching Tool, as supplied with your unit (approx. 45mm x 5mm)



Instructions

1. Insert the Detaching Tool into the small hole along the left-hand side of the charging gun grip.
2. Check that the RED line on the Detaching Tool aligns with the surface of the grip.
3. Apply pressure on the top edge of the Detaching Tool, towards the green connector release button. This should retract the locking pin within the charging gun.
4. Finally, remove the Detaching Tool, before pushing the green connector release button to remove the charging gun from your vehicle.



Step 1



Step 2



Step 3



Step 4

LED signal descriptions (Table 1)

LED state, colour	Notification
1. All LEDs are off	The charger is not receiving power; it may be disconnected from the mains.
2. Primary LED lit, white	The charger is being controlled by Kaluza; it's working normally.
3. Primary LED lit, blue	The charger is in Boost mode (activated in App or by pressing the Boost button on the charger).
4. Primary LED green, flashing	The CHAdeMO cable connection is in progress.
5. Primary LED white, lit in steady state	The charger is booting up.
6. Primary LED blue, flashing	A software update is in progress. Please do not disconnect from the internet.
7. Primary LED purple, flashing	The charger cannot communicate with Kaluza; there may be a network problem. Check your home internet connection and ensure all wires and modems are properly connected.
8. Primary LED red, flashing	The charger has a temporary fault; it should be resolved soon.
9. Primary LED red, lit in steady state	A serious fault has occurred on the charger; contact support.
10. Panel LEDs, off	The vehicle is not connected to the charger.
11. Panel LEDs white, all on	The charger knows the vehicle is connected but is currently idle.
12. Panel LEDs white, racing down	The charger is actively charging the vehicle.
13. Panel LEDs white, racing up	The charger is exporting energy from the vehicle.
Battery LEDs:	
14. - All LEDs unlit for empty EV battery - 1/2/3/4 LEDs white, lit according to % full (4 LEDs indicates full battery)	Battery state-of-charge indicator

Technical specification (Table 2)

Model Name	Vehicle-to-Grid Charger
Mode	Mode 4: CHAdeMO protocol
Overall Dimensions	520mm x 272mm x 690mm
Weight	27kg
Charging Cable Length	Up to 5m
Operating temperature	-25°C to 50°C
Storage temperature	-20°C to 80°C
Operating humidity	10% to 85%
Installation	Indoor / Outdoor wall mounted
Communications	Ethernet (direct cable or via power line communication)
User Interface	Buttons on charger front Kaluza app Emergency stop
Grid Connections	G83, G59, G98, G99
Certification	- CE marked
Plug Type Connector	CHAdeMO
Cooling	Forced air
Communication Protocol	Kaluza proprietary, TLS
Degree of protection	IP64 protection

Electrical specification (Table 3)

Input - AC (from the grid)

Nominal input power	6kW
Maximum Continuous input current	Variable up to 26A
Nominal frequency	50Hz
Metering	Accuracy to 0.2s
Overvoltage category	CAT III
Efficiency	~96%

Output - AC (to the grid)

Nominal output power	6kW
Output voltage	230V, AC \pm 15% (1P)
Maximum Continuous output current	Variable up to 26A
Nominal frequency	50Hz
Islanding protection?	Yes
Efficiency	~96%

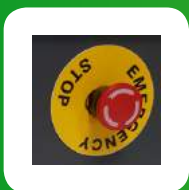
Output - DC (into vehicle)

Maximum DC Power	6kW
Maximum Input Voltage	500V (385-400V nominal)
Maximum Input Current	15A DC

Reverse Polarity Protection	Yes
Ground Fault Isolation Detection	Yes
Power factor	Pure sine wave

Safety features (Table 4)

Emergency Stop Button	Yes
Short-circuit protection	Yes
Over-current protection	Yes
Isolation system	Reinforced Isolation
AC Earth leakage protection	Yes
DC Earth leakage protection	Yes



Emergency stop

The emergency stop is a red button located on the bottom right side of the V2G Charger and marked with a yellow 'EMERGENCY STOP' sticker. In case of emergency, press the button firmly to cut the power supply to the charger. Ensure the area is safe and contact Customer Support before attempting to reset the button. In the event of an accidental activation of the button, it can be reset with a clockwise rotation.

General information

Vehicle compatibility

The Vehicle-to-Grid charger works on all Nissan LEAF cars, however the vehicle warranty is only guaranteed for models with a battery size of 30kWh or greater.

Validity of this manual

All of the specifications, provisions and instructions contained in this manual apply solely to standard versions of the Vehicle-to-Grid Charger.

This manual is valid for the following models:

- **Vehicle-to-Grid Charger 170911A101**

Disposal



In accordance with European Directive 2002/96/EC on Waste Electrical and Electronic Equipment ("WEEE") and its implementation in national law, used electrical devices such as the Vehicle-to-Grid Charger must be collected separately and recycled in an environmentally responsible manner.

Please ensure that you obtain information regarding a local, authorised collection and disposal system for compliant disposal of your used Vehicle-to-Grid Charger. Failure to comply with this EU Directive may result in a negative impact on the environment.

Open source declaration

This product contains Free/Open Source Software. For further information, please visit https://storage.googleapis.com/etp_oss/index.html

Manufacturer

This product is manufactured in the UK by Indra Renewable Technologies Ltd, company no. 08740976.

Certification and compliance

Certification:

- CE marked.

Compliance:

- **94/62/EC** Packaging and packing waste.
- **EN 62477-1_2012+A1_2017** Safety requirements for power electronic converter systems and equipment.
- **IEC 62311:2008** Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0-300 GHz).
- **EN 60529:1991+A1:2000** Degrees of protection provided by enclosures.
- **EN 50581:2012** Technical documentation for the assessment of electrical and electronic products with respect to RoHS.
- **IPC-A-610** Acceptability of Electronic assemblies.
- **BS7671:2015** Wiring regulations.
- **IEC 62909-1 2017** Bi-directional grid-connected power converters.
- **BS EN 60669-2-4:2005** Switches for household and similar fixed electrical installations Particular requirements. Isolating switches.

