Understand your ZAPPI EV charger

zappi

eco-smart EV charge point

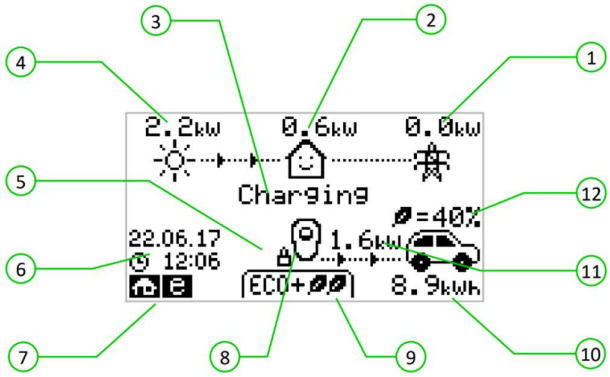
ENERGLAZE HOME ENERGY UPGRADES

Operation

Controls & Indicators

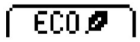
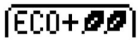
1.	Display	Graphical LCD display with LED backlight • Backlight can be activated by tapping the unit.
2.	Front Fascia	Remove fascia for installing and servicing
3.	Tethered Charging Cable if applicable	6.5-meter cable with a Type 2 plug or Type 2 socket with locking system for untethered models.
4.	Control Buttons	Four tactile buttons used to navigate the menus and alter settings: • Menu • Change charge mode | Move up a menu item | Increase value • Change charge mode | Move down a menu item | Decrease value • Boost | Select item | Confirm value and move to next setting.
5.	Integrated Cable Holster (tethered units only)	When not in use, the charging cable should be wrapped around the unit and secured in the cable holster (tethered units).
6.	Charging Connection Point (untethered units)	When cable not in use, the charging cable should be unplugged and stored in a cool dry place.
7.	RGB Indicator	Visual Indicator that changes colour dependant on the zappi's charging state. (see RGB Indicator page 9)

Display



1.	Import / Export Power	The power being either imported or exported from or to the grid (kW). The direction of the arrows indicates if the property is currently importing power (left) or exporting power (right). The size of the arrows is proportionate to the level of power being imported / exported, When the property is neither importing or exporting power the figure will be 0.0kW and there will no animated arrows. The property is then said to be 'in balance'.
2.	House Load Power	The power that the property is currently using in kW. *(**Note**: This is displayed only when the Generation Sensor is installed directly to a CT input or a harvi or other myenergi device)*
3.	Status Text	The current status is displayed here (see Status Screens Page 12).
4.	Generation Power	The power being generated at this time in kW. *(**Note**: This is displayed only when the CTs are installed either hard wired to the CT inputs of the zappi or wirelessly to a harvi or other myenergi device)*
5.	Lock Icon	Operation lock is active.
6.	Date & Time	The current date and time.
7.	Mode Icons	These icons indicate that the import limiting is active (house), Demand Side Response (~) or the *eSense* input is live (e) see page 44.
8.	zappi Icon	If you see wavy lines above the zappi icon, the unit is thermally limiting! The output power is temporarily reduced.
9.	Charge Mode	Shows the selected Charging Mode; FAST, ECO or ECO+ (see Charging Modes page 14).
10.	Charge Delivered to EV	The accumulated charge energy that has been sent to EV in this charge session.
11.	Current Charging Power	When the EV is charging, arrows will show here along with the charging power in kW.
12.	Green Level of Last Charge	This is the percentage of 'Green' energy for the last charge session, this is shown at the end of a charge or when the EV is unplugged.

Display Icons Key

	House Consumption – Not Importing		Charge Mode = FAST
	House Consumption – Importing		Charge Mode = ECO
	Solar Generation Power		Charge Mode = ECO+
			Charge Mode = STOP
	Wind Generation Power		zappi Device – Normal On the three phase zappi the number in the icon indicates whether the EV is charging with a single phase or all three phases.
	Grid Power – Import / Export		zappi Device – Too Warm (output limited)
	Power Flow Direction – Small Amount		Import Power Limiting Active
	Power Flow Direction – Medium Amount		Economy Tariff Electricity Available
	Power Flow Direction – Large Amount		Current Charging Power
	Waiting for Surplus Power		Energy sent to EV for this charge
	DSR Mode (demand-side response)[2]		Warning – refer to text on screen
	Lock icon – zappi or cable locked (untethered versions only)		

RGB Indicator 

The lighting flash indicator on the front of the zappi indicates the status of the charge. The default colours are:

Pink:	Connected
Green:	Charging 100% Green
White:	Charging from Grid only
Yellow:	Charging mix of grid/green energy
Blue:	Charge complete
Red:	Error

These colours can be adjusted on Display & Sound menu (firmware version 2.163 onwards)

The colour effect (pulsing of the LED brightness) varies according to the charging power

[2] DSR – Demand Side Response – A smart feature for future use by electricity suppliers and distribution companies to help manage load on the electricity system at times of high demand. This feature can only be enabled by the owner of the zappi

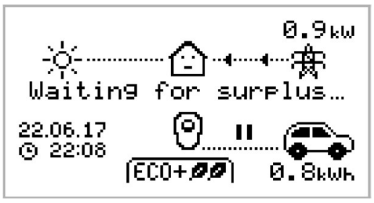
Status Screens

EV Disconnected

The EV is not connected to zappi.

In this example the last charging session delivered 20.8kWh of energy to the EV and 80% of that energy came from the solar panels.

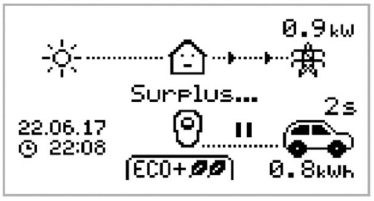
Waiting for Surplus



zappi is waiting for sufficient surplus power from the microgeneration system. This screen will be shown in ECO+ mode as it is only in this mode that charging will stop if there is not enough surplus power.

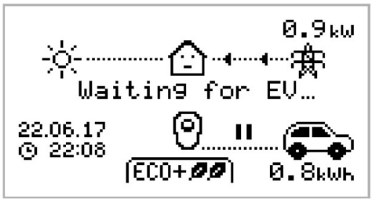
The house in the centre is straight-faced as grid electricity is being used by the house (0.9kW in the example shown).

Surplus



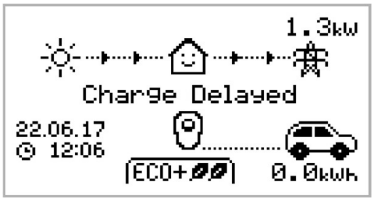
Enough surplus is available and zappi is about to charge the EV. A timer is decremented and can be set in the charge settings (ECO+ mode only).

Waiting for EV...



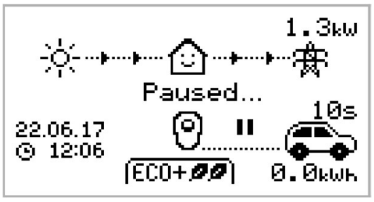
zappi is waiting for the EV to respond; the EV is not ready to accept charge.

Charge Delayed



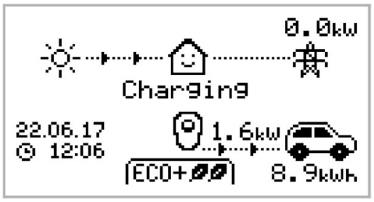
The charging session has been delayed by the EV because a scheduled charge has been set in the vehicle.

Paused...



zappi is paused for a few seconds in order to limit the start/stop frequency during ECO+ mode charging.

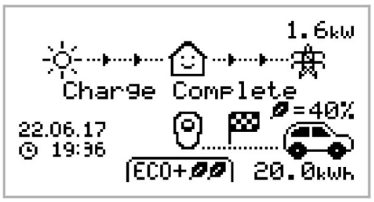
Charging



The EV is charging.

In this example the car is charging in ECO+ mode at 1.6kW, there is no import or export from the grid (0.0kW) and the EV battery has charged by 8.9kWh since the car started.

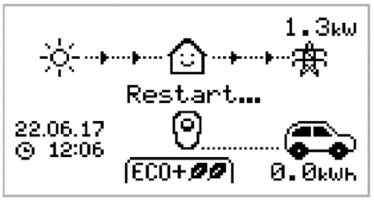
Charge Complete



The EV is fully charged.

The charge energy used during the last charge is displayed at the bottom right (20.0kWh in this case) and the 'green contribution' is also shown (40% in this example).

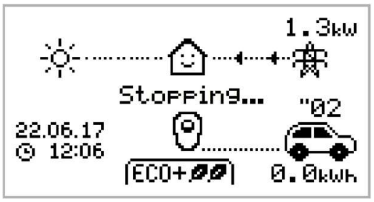
Restart...



zappi is performing a restart sequence.

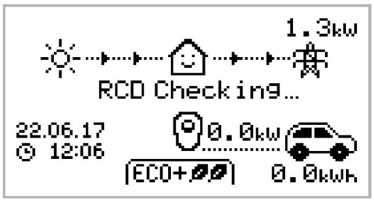
This may happen with some EVs that need to be 'woken-up' to start charging after a pause in the charge. Charge should start immediately afterwards, otherwise the “Charge Delayed” message will appear.

Stopping...



zappi is about to stop the EV charging

Checking...



zappi is carrying out a check to make sure that the built in RCD and “PEN Fault” protection is working before starting to charge the car. zappi carries out this before every charge so there is no need to manually test the RCD protection.

Charging Modes

zappi has three different charging modes and a "STOP" mode which can be selected simply by pressing the ∧ and ∨ buttons when the main screen is showing. The charge mode can be changed before or during a charge.

Regardless of the charge mode, all the surplus electricity is used. zappi's special eco charge modes limit the amount of grid electric used. Below is explanation of each of the charging modes.

FAST ▶▶ **Charges at the fastest rate.**

Fast Mode will charge the EV at the fastest rate and will import grid electricity if there is insufficient surplus generated power.

The actual charge rate is dependent on the EV's onboard charger and the grid supply voltage. Some vehicles can charge at 11kW or 22kW on a 3-Phase zappi, but many EV's have lower charge rates. The maximum charge rate for the single phase zappi is 7kW.

ECO **Adjusts the charge rate to limit the use of electricity.**

The charge rate is continuously adjusted, in response to changes in generation or power consumption elsewhere in the home, thereby minimising the use of grid power.

Charging will continue until the vehicle is fully charged, using available surplus power.

If at any time, the available surplus power falls below 1.4kW, the shortfall will be drawn from the grid.

Note: The EV charging standard does not support charging below 1.4kW.

ECO+ **Adjusts the charge rate to limit the use of grid electricity and will pause the charge if there is too much or any grid electricity being used *(setup dependent)***

The charge rate is continuously adjusted, in response to changes in generation or power consumption elsewhere in the home, thereby minimising the use of grid power. Charging will pause if there is too much imported power, continuing only when there is enough surplus power available. The surplus power threshold at which the charge will start or stop can be set using **Min Green Level** in the **ECO+ Settings** of the **Charge Settings** menu.

The actual green contribution percentage is shown when the charge is complete or when the zappi has been disconnected from the EV.

It is possible to charge the EV using only surplus renewable power, if there is sufficient surplus power available and a boost option has **not** been set. ***(Please note:** The EV charging standard does not support charging below 1.4kW)*

Example: when zappi is set to a Min Green Level of 100% you will need in excess of around 1.4kW of surplus energy available to start the charge. If the surplus falls below the 1.4kW threshold the charge will pause until the threshold is once again met. After a short delay zappi will resume charge.

If preferable, you can set the zappi to share power from the grid and a generation source to ensure a charge is always maintained. For example, the Min Green Level could be set to 75%. A charge will then start when there is a surplus of 1.05kW, taking a further 0.35kW from the grid. It is worth noting that this is only required to start a charge. If a higher amount of surplus becomes available it will be consumed, resulting in less being drawn from the grid.

STOP **The output from zappi is turned off**

In STOP mode zappi will not charge your EV. **This includes the boost modes and timed boost**. zappi will continue to measure power and communicate with the other myenergi devices.

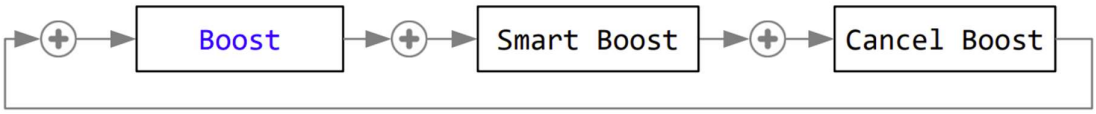
Manual Boost

The Manual Boost function can only be used when charging in ECO or ECO+ mode. When boosting, the charge rate is set to maximum (just like FAST mode), until a set amount of energy has been stored in the EV's battery. After which, zappi will revert to ECO or ECO+ mode.

This function is useful if you arrive home with an almost flat battery and would like to charge the vehicle immediately to ensure there is enough charge for a short trip if needed.

The amount of energy delivered to the EV during the boost charge can be changed in the Charge Settings/Boost menu.

When in ECO or ECO+ mode, each press of the button will cycle through the boost options as illustrated below:



Activating Boost

1. When charging in ECO or ECO+ mode, press ⊕ until BOOST is shown.
2. The boost will start after a couple of seconds and the display will show the remaining boost energy

The boost duration can be altered in the Charge Settings/Manual Boost menu option.

Cancelling Boost

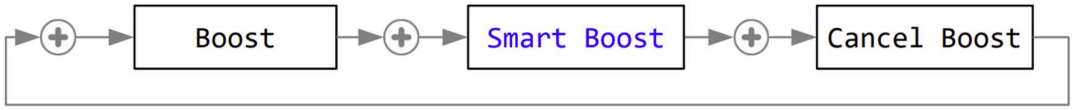
The boost can be cancelled by pressing ⊕ until Cancel Boost is shown.

Smart Boost

The Smart Boost function will charge the EV with a minimum kWh figure by a set time. Smart Boost is available only in ECO and ECO+ modes.

- **The Smart Boost function does not bring the battery to a certain state of charge. The target kWh is only the energy added during the charging session.**

When in ECO or ECO+ mode, each press of the button will cycle through the boost options as illustrated below:



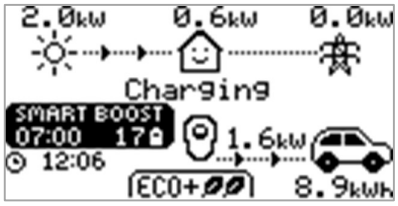
Example: It's a sunny Sunday and you wish to ensure there is enough charge in the EV to get to work in the morning (e.g. 15kWh), but in the meantime, you want to use the surplus energy from the PV system to charge the car, so you choose to use ECO+ mode. At sunset there was only 10kWh of charge accumulated. However, because you activated

Smart Boost, and set the time you needed to leave for work, zappi automatically boosted the charge in the night to top up the battery to the required 15kWh by 7am.

Activating Smart Boost

1. When charging in ECO or ECO+ mode, press ⊕ until SMART BOOST is shown.

2. The SMART BOOST icon will show including the target time and the pre-set energy amount.



3. zappi will then test the EV for a few seconds, to determine the maximum charge rate.

4. The boost will start at the latest possible time to achieve the set energy amount, if the current charge session has already accumulated enough energy, the boost will not be required and so will not operate.

The required energy and target time can be altered only when Smart Boost is not active. These settings are in the Charge Settings/Smart Boost menu option.

Cancelling Boost

The boost can be cancelled by pressing ⊕ until Cancel Boost is shown.

Programming the Smart Boost Values

1. From the main screen, press ≡ to enter Main Menu

2. Select Smart Boost from within the Charge Settings menu. The SMART BOOST screen is then shown

3. The boost can now be edited: Use ∧ or ∨ buttons to edit the target time and amount of charge (kWh) that is required

4. Use ⊕ the to move to the next value, and the ≡ to return to the main screen once the required Smart Boost parameters have been set

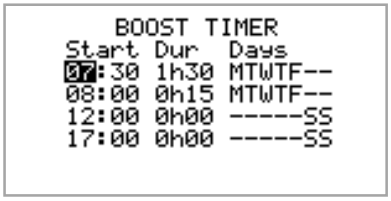
Boost Timer

When using ECO or ECO+ charge modes, zappi can be programmed to 'boost' the current charge at certain times. When boosting, the charge rate is set to maximum (just like FAST mode), regardless of the amount of available surplus power. This means that power may be drawn from the mains grid supply during boost times.

- There are four editable time slots which can be set to operate for certain days of the week.
- Setting the duration to 0h00 will make the boost inactive.

Programming Boost Times

1. From the main screen, press ≡ to enter Main Menu
2. Select Boost Timer from within the Charge Settings menu. The BOOST TIMER screen is then shown.
3. The boost can now be edited: Use ∧ or ∨ buttons to highlight the time slot you wish to change. The lower screenshot shows the start hour being edited:
4. Alter the start hour with the ∧ or ∨ buttons and then press + to move to minutes.
5. Edit the duration in the same way and then press + again to edit the days of the week you want the boost to be active for. Each day of the week can be toggled on/off with ∧ or ∨ buttons. Press + to go to the next day. Pressing + on the last day (Sunday) will confirm the boost time slot and the whole line will be highlighted again.
6. Press ≡ to exit the BOOST TIMER screen.



Economy Tariff Boosting

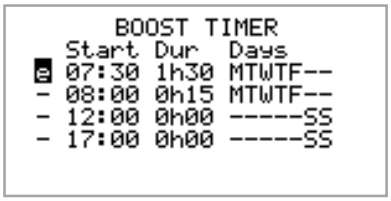
Boosting only when economy rate electricity is available can be achieved in one of three ways:

1. By setting the boost timer to coincide with the economy tariff times. This option should be used only if the electricity meter is a dual-rate meter (modern meters usually are).
2. Boost only at set times AND if economy rate electricity is available.
3. Automatically boost whenever the economy tariff rate electricity is available, regardless of boost times*

*Options 2 and 3 are available only when using the eSense input.

For option 1, the eSense Input in the Advanced menu should be set to Boost Timer Enable.

With the Boost Timer Enable function set, the BOOST TIMER screen will include an extra column. The **e** can be toggled on/off. If **e** is present, the boost will activate only when the boost times are valid and the economy rate tariff is available.



Alternatively the eSense input can be used to activate the boost whenever the economy tariff rate electricity is available, regardless of boost times (option 2). To do this, the eSense Input option in the Advanced menu should be set to Boost. When using this option, the Boost Timer is not needed.

Boost Time Conflicts

If one or more boost times conflict, the boost will follow the latest time or longest duration.

Lock Function

zappi can be locked from unauthorised operation. The Lock Function requires a PIN number to be entered before the unit can be operated and/or a charge is allowed. The main display can also be hidden when zappi is locked.

The lock can be set to be active

- Only when the EV is plugged in
- Only when the EV is unplugged.
- All the time.

The settings for the Lock Function can be found in the Other Settings/Lock Function menu option.

Lock Function Setting	Description
EV Plugged	The Lock Function is active when the EV is plugged in, preventing tampering with the charge session, or changing any settings
EV Unplugged	The Lock Function is active when the EV is disconnected, preventing unauthorised charging
If **EV Plugged** and **EV Unplugged** are both set, then the PIN lock is always active. **zappi** is effectively locked against any unauthorised use and the PIN code will always be required to make any changes locally or to start a charge. These are the recommended settings if **zappi** is mounted in an exposed / publicly accessible location and you do not want anyone else to be able to use it.	
Timeout	The time before the Lock Function automatically reactivates after being unlocked
Lock Code	This is the current lock code and is five digits from (1 to 4), it can be changed here **Default code: 44444**
Auto Hide	If set, this will hide the main display of the zappi to keep the power readings private
Charge:	Allow a charge session without the need to enter a pin-code. Useful to leave zappi access free but with the settings protected.
Test	Tests the socket lock solenoid when the charging cable is not plugged in.
If **zappi** will be used to provide public access for EV charging, then it is recommended to use the following settings: • **EV Plugged** – On • **EV Unplugged** – On • **Charge** – On • **Lock Code** – changed to a private PIN number	

Socket Lock

For untethered units only, the EV cable will be locked automatically when it is inserted into the zappi, even if it is not plugged into the EV. A small 'lock' icon will be seen on the right side of the zappi, in the centre of the screen. When the EV is disconnected, a press of the ⊕ button, will unlock the cable for a duration of 5 seconds, allowing the cable to be removed from zappi. After this time, the lock will be re-activated.

If the 'Lock Function' (PIN lock) feature is enabled in the zappi, the cable will not be locked into the socket until the PIN is entered and EV charging starts. This means that if anyone plugs their cable into the zappi but they do not know the PIN they are able to remove their cable.

In all cases the cable is unlocked if zappi detects a fault or the power supply to the zappi is switched off.