active
ELECTRICAL SUPPLIERS LTD

LIGHTING
INDUSTRIAL
COMMUNICATIONS
AUTOMATION

EV Charging Solutions

An extensive range of electric vehicle charging solutions for domestic and commercial installations from two of the worlds leading manufacturers

circontrol

smappee

www.goactive.nz

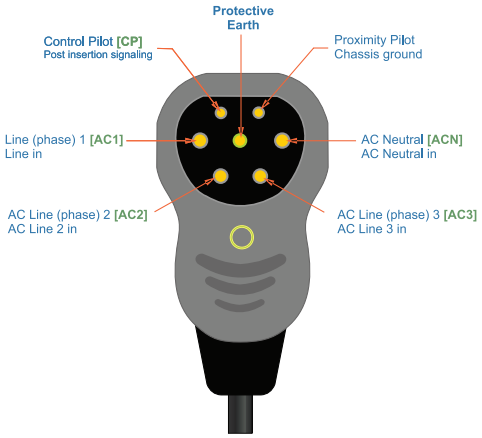
Overview of EV Charging Systems

As electric vehicle sales grow year on year, the need for EV users and owners to easily recharge their vehicles in a convenient and cost effective way becomes an important part of EV ownership.

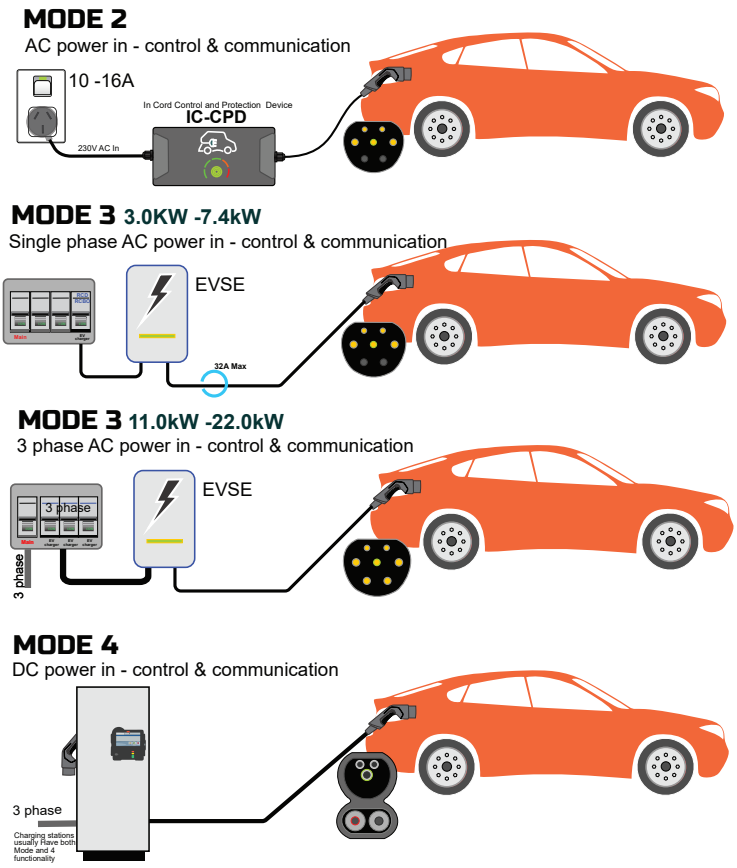
Home, business or workplace EV chargers are not actually chargers, they are a safety and control interface for the AC voltage supplied from a building, to the EV's on-board AC to DC charger. These units are refereed to as **EVSE** (Electric Vehicle Supply Equipment).

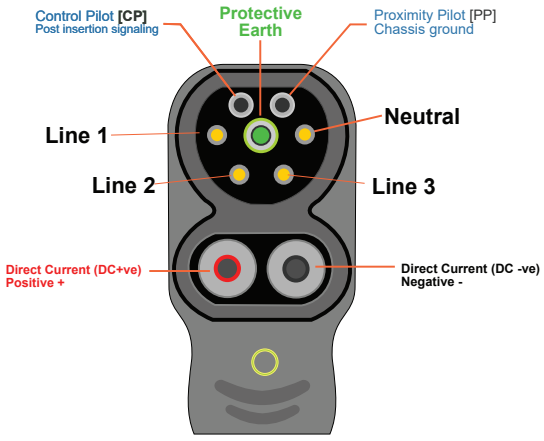
Commercial high speed DC fast chargers are directly charging the EV's battery at high power levels.

AC Type 2 plug
1 Ph 7.3 kW
or 3 Phase AC 43 kW



EV Charging Configurations





DC type 2 CCS plug
DC charging
up to 400 Amps / 1000V DC

The **Control Pilot** (CP) line is used by the vehicle's On-Board Charger (OBC) and the EVSE to communicate the charging system state, the EVSE's maximum charging current and any errors.
This is not an electronic data communication.

The **Proximity Pilot** (PP) line comprises a circuit designed to indicate to the OBC the type of EVSE and charging cable connected to the vehicle.
A connection is made between the vehicle and EVSE by plugging a Type 2 charging cable connector into the vehicle's charging port the measured value sets the charging rate from the EVSE.

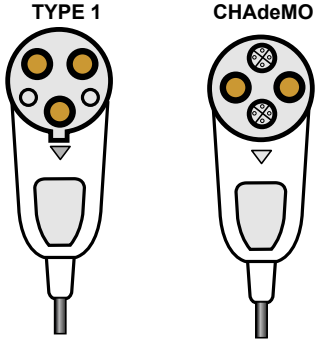
IC-CPD - Mode 2

In Cord Control and Protections Devices (IC-CPD's) are often supplied with an EV at the time of purchase. They are sometimes referred to as trickle chargers. IC-CPD's are not battery chargers, they are a control and safety interface between the power socket outlet and the EV's on board charger. They are limited to 10A for connection into a standard 10 or 15 Amp 3 pin - flat pin socket outlet.

Other EV Plug Connections

J1772 connector Type 1 used by Japanese imports.
Type 1 connector lacks an automatic locking mechanism, which makes it less secure than the Type 2 connector.

The CHAdeMO connector is a DC fast-charging standard that was initially developed by Japanese automakers and released before CCS.



Electrical Considerations for EVSE Installations

The electrical requirements for EVSE installation are not covered in the current version of the wiring rules (AS/NZS3000:2007), so additional Standards have been developed for New Zealand in the form of - **NZS PAS 6011:2021** in conjunction with the **Electric Vehicle Safety Charging Guidelines** (Worksafe NZ).
These documents are publicly available and provide safety information to EV users or those considering an EV purchase.

The Standards above refer to **EVSE - Electric Vehicle Supply Equipment,** as these units are often referred to as EV chargers. They are primarily an electricity safety and control interface from the buildings power system to the EV's on board charger (OBC) and battery management system which are bespoke to that EV.

EVSE units must be installed by an electrician holding a current NZ practicing licence.

Fig 1. Shows the general arrangement required for the installation of a domestic or single unit commercial EVSE.

EVSE's for domestic use are limited to a maximum input power of 32 Amps a.c. In order to substantially charge an EV a considerable amount of power over an extended period may be required (depending on level of charge and the capacity (kW rating) of the EV's battery.)

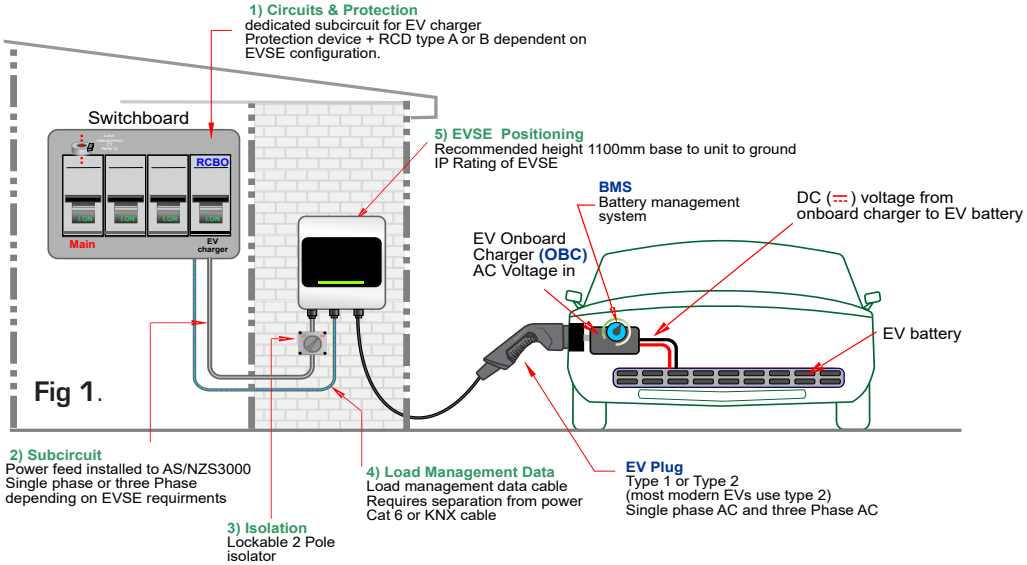


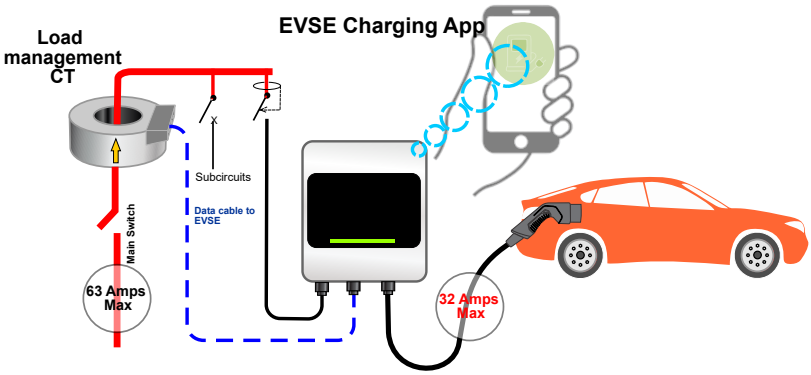
Fig 1.

Before selecting or installing an EVSE, the building and electrical infrastructure should be assessed by a qualified electrician. The electrician will access the buildings electrical systems and provide advice on the suitability for an EVSE installation.

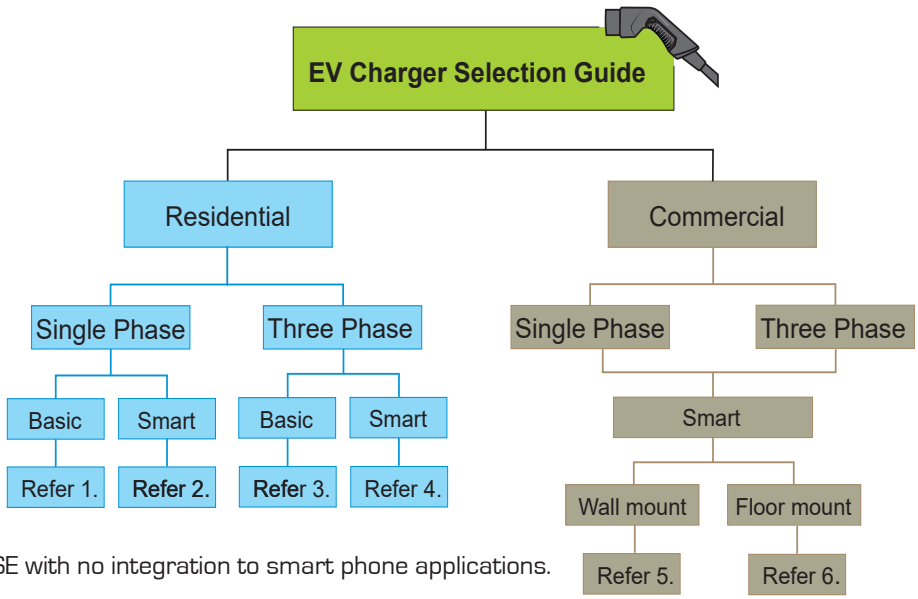
Load management and smart EVSE's

Load management uses a small CT (current transformer) fitted at the consumers switchboard. When connected in conjunction with the EVSE, the home or building can be protected from overloading the supply fuse and consumer mains by setting the appropriate parameters. The EV charging parameters can be set so the EV charging current is variable and relative to the homes total power load.

With smart charging, the smart phone App allows for installation setting of the maximum power limits. The EV's rate of charge is managed in conjunction with the fluctuating building demand. It also maximises the options for off-peak or special tariff rates from the consumers energy retailer.



Basic arrangements for EVSE Load management



Basic:- refers to EVSE with no integration to smart phone applications.

Smart:- refers to EVSE with integration to smart phone application and communications to Load management controls"

	Circontrol Models				Smappee Models		
Model	**eHome**	**eNext Park S2**	**eNext Elite**	**Post eVolve**	**EV Wall Home**	**EV Wall Business**	**EV Base**
1	●						
2		●			●		
3	●						
4					●		
5			●			●	
6				●			●

Optional charging cables

Type	Cable length	Power connection	Suitable for EVSE models
Type 1 to type 2	5 metres	Single phase 7.4 kW	eNext Park S, EV Wall
Type 2 to type 2	5, 7 & 10 metres	Single phase 7.4 kW	eNext Park S, EV Wall
Type 2 to type 2	5, 7 & 10 metres	Three phase 22 kW	eNext Elite, Post eVolve, EV Wall Business, EV Base

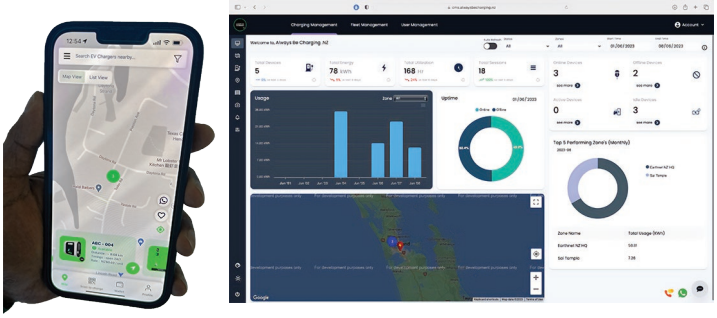
ALWAYS BE CHARGING.NZ - a digital key for EVSE's

Always Be Charging is a locally developed App for Apple and Andriod phones that provides integration with smart EVSE's using OCPP (Open Charge Point Protocol). This App provides a stress free charging experience for EV users and remote back-end CMS (Charging Management Software) for the operator.

The App and CMS works with any smart EVSE and, it provides functionality to manage public billing for EV users using affiliated charging points.

For the EV driver the App provides: Navigation details to charger location, charger status, operating hours - open or closed, EV energy charge rate $/kWhr, and advanced booking of EV charger.

For the EVSE operator the App provides: Peace of mind and security with EV user authentication via QR code, or RFID tag, and electricity load management control.



(Visit the website for full details or call 0800CHARGING)

circontrol

Model eHome
Domestic Mode 3 Charger

Model code: **T2C32 (type 2 x 5m Charging cable)**
T1C32 (type 1 x 5m Charging cable)

Electrical safety protection: Built-in 6mA RDC-DD + 30mA type A RCCB

Conceptual Design

An attractive and compact design is key for home chargers to fit into your garage. The eHome was created drawing on this vision, for great durability and an easy-to-use design, while remaining affordable.

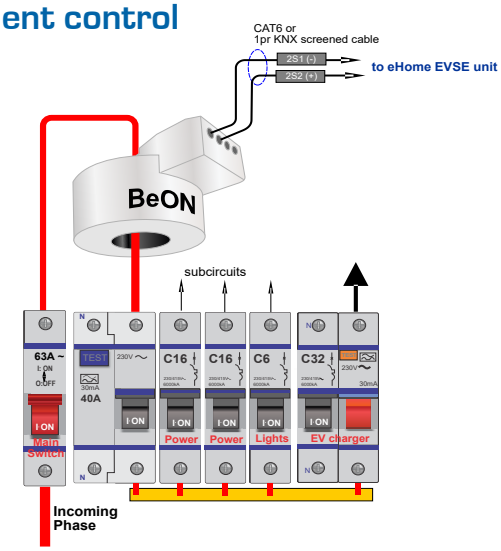
Application

Designed to be installed at a variety of home charging settings, such as a home garage or private workplace.

Features:

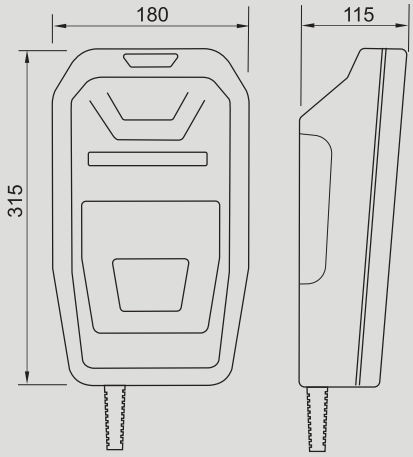
- IP54 Rating
- Type 2 plug wired in charging cable
- ABS (UV resistant) housing
- LED bar at the front panel provides users with information about the charger's status:
  - Green - Available and ready to Charge
  - Flashing blue light - Charging
  - Constant blue light - Charging complete
  - Red - Fault detection
- Built-in fault diagnostics
- Metal cable holder

Load management control



BeOn is Circontrol's oad management hardware. BeON is a sensor that can be easily added to a modern switchboard to dynamically adjust the current supplied to the EVSE to the power available at any given time, thus avoiding overloading or disrupting the use of other building appliances.

The eHome is equipped with a 6mA Residual Current Detection Device (RDC-DD) and a 30mA type A RCD under a lockable front flap. This feature allows the user to easily reset this safety device should it trip for any reason.



eHome is compact so it can easily fit, to be discreet in small garages or carports.

Model eNext Park S2 and Elite

Powerful intelligent EV chargers with the possibility of having connections to a cloud-based software or back end system for billing or system management.

Application

Designed to be installed indoors or out in workplaces, apartment blocks, communal parking areas.
Capability for building owners to charge for or restrict usage to staff, or clients.

Features:

- Single phase (Park S2) Three phase (Elite)
- 32A / phase input current
- 22kW outlet power
- Type 2 charging cables (ordered separately)
- ABS (UV resistant) housing
- RGB Led status indication on front panel
- RFID reader
- Built-in fault diagnostics
- Enclosure rating: IP54

eNext Park S2

Electrical safety protection: Requires Type "B" RCD at main switchboard

Mode 3 single phase (up to 64A supply)
Can be configured as:

- A) Single EV charging
- B) Two EV's simultaneous charging
- Ethernet connection 10/100BaseTX (TCP-IP)
- 4G modem built-in
- 2 line LCD display for user charging information
- Open Charge Point Protocol (OCPP)
- Built-in energy meter for accurate kWhr billing

eNext Elite additional features

Electrical safety protection: Built-in 6mA RDC-DD + 30mA type A RCCB

- Three phase electrical connection
- Backlit 3.5" LCD panel provides user guidance instructions.
- Wi-Fi connection.
- 4G modem built-in

ENext Park S2
Model code: Park-STwo

eNext Elite
Model code: Elite T

eNext Park 2 and Elite shown installed on the optional aluminium powder coated pedestal (H:1500, D: 150, W: 370mm).

circontrol

Model Post eVolve (3 Phase)

Model: Smart-T

Electrical safety protection: Two built-in RCD's Type B 30mA

Application

Designed to be installed in both public access environments e.g. urban spaces, shopping centres, car parks, airports, petrol stations, and private areas where it's intelligent capabilities offer a range of possibilities which improve the user and operator experience.

Features:

- Up to 44kW of charging power
- Shuttered socket outlets
- Two built-in MID power meters
- Two type 2 charging plugs
- Communication, Ethernet port (by default)
- Embedded load management network integration
- Enclosure rating - IP54
- Robust aluminium & ABS case
- Front door lock with key (operator access)
- Interface protocol: OCPP1.6
- Charging leads (type 2) are ordered separately
- Optional 4G modem
- Option for front panel logo's or advertising

Charge point operations

Communication, either by its Ethernet port (by default) or 4G modem (optional). The charger can be connected to a back-office system (by means of OCPP) obtaining benefits such as user management, billing, remote error diagnostics etc.

To comply with the most demanding requirements regarding billing, eVolve series includes a MID certified meter on each outlet.

Post eVolve offers a flexible authentication, meaning the user can either authenticate before or after connecting the cable to the EV. Additionally, the authentication process can also be disabled for a 'plug & charge' use mode.

Post eVolve

User Interface

Clear charging instructions and plug status are shown using a back-light display, increasing user satisfaction, especially useful when the charger has been previously reserved by another user.

Dual LED's provide EVSE operational status.

Smappee EV Wall Home

Model: EVW-132-C8R-E-W-100A

Electrical safety protection: Built-in 6mA RDC-DD + 30mA type A RCCB

The Smappee EV Wall Home EVSE provides a stylish and very functional solution for EV charging in homes. It can be easily optimised for off-peak charging and where the home has a solar PV system.

The Smappee EV Wall Home is quick to install with a simple cable configuration and installation wizard. There are options available for single-phase or three phase homes.

Features:

- Awarded No1 by Clean Energy Reviews for best smart EVSE.
- Free smart phone smart charging App
- Plug & charge functionally
- Swipe card or App authorisation for multi-user or user-pay applications. (one swipe card included)
- Single phase 7.4 kW (32 amps max) output or
- Three phase 22 kW 32A/phase output
- Supplied with type two tethered 8 mtr cable and holder or Type 2 socket
- IP54 rated, powder coated metal & aluminium enclosure
- 36 Month warranty
- Includes Smappee Infinity fittings for load management. Refer Smappee Infinity Page10

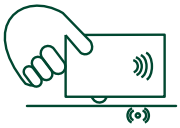
Intelligent Load management with Smappee Infinity

What makes the Smappee EV charging systems such exceptional value is the included integrated energy management hardware and control system.

The Smappee EV Wall Home comes complete with the hardware to install at the main switchboard, so the system can monitor and limit the maximum power demand on the consumers electrical systems. With this, there is no risk of overloading the building fuses or power supply. Although this may sound complicated, for any building with a modern switchboard it is a simple task for the installing electrician.

The infinity Load management system integrates seamlessly with the smart phone App or the Smappee PC home dashboard to provide a total energy management solution.

Plug and charge

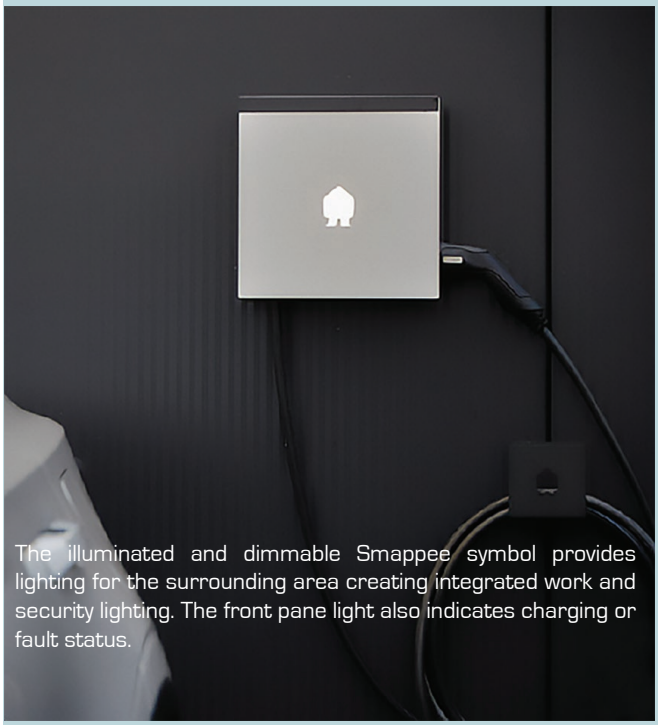


Swipe and charge

Scan and charge

Technical advice email - evcharger@goactive.nz

Smappee EV Wall Home
Single phase 7.4kW



The illuminated and dimmable Smappee symbol provides lighting for the surrounding area creating integrated work and security lighting. The front pane light also indicates charging or fault status.

Manage charging sessions from anywhere with your smart phone.

The Smappee App allows the user to easily control charging times, and schedules to optimise the available power and tariff rates. The App also provides monitoring of the vehicles charge status, along with unique options for power usage and control, system status, and charging data reporting.

smappee

Smappee EV Wall Business

Model EVWB-332-C8R-E-W

Electrical safety protection: Built-in 6mA RDC-DD + 30mA type A RCCB

The Smappee EV Business 22kW three phase electric vehicle charger provides an award winning design aesthetic for any business or commercial property. Equipped with extensive range of options for business to provide a viable charging facility for staff or customers.

The EV Wall Business works with single-phase 240V AC (7.4kW) or three phase 400V AC (22kW) output.

- Integrated safety feature RDC-DD protection
- IP54 rated, powder coated metal & aluminium enclosure
- 36 Month warranty
- "Smappee Infinity for load management is purchased separately with a range off available options

The EVSE can be ordered with option:

(a) Type 2 socket on the wall unit, this allows the lead to be removed for security.
(b) Supplied with an 8m lead with type 2 plug, which is wired directly into the wall unit.

The Smappee EV Wall Business is easy to install with simple cable configuration and installation wizard. The integrated LED lighting indicates charging status and provides (programmable) ambient lighting when not in use.

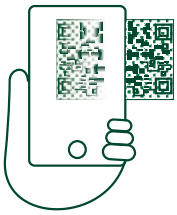
Integrated payment options

Being OCPP 1.6 J compliant, the EV Wall Business can be configured to operate with a third party billing platform. Charging sessions can be started and stopped via plug & charge, RFID, smart charging schedules, and QR code for CPO services.

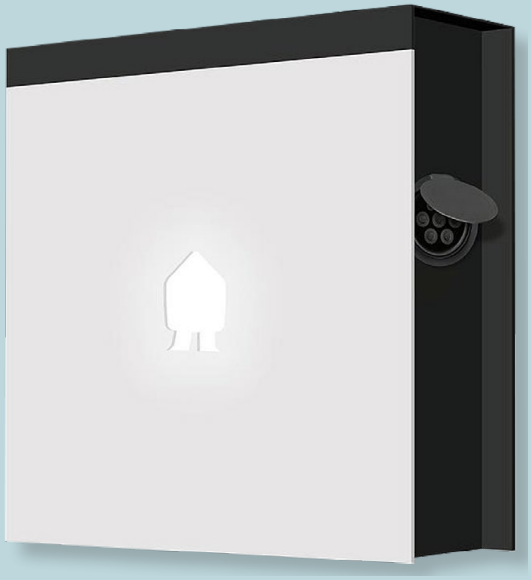
Three easy ways to offer EV charging for business

Plug and charge - Plug the EV into the Smappee Wall Business to start charging, and unplug it to stop charging.

Swipe and charge - Plug in, swipe an RFID card in front of the LED lights and start charging. And for added safety: the charging station unlocks only after the card is swiped. Charging can also be controlled in the App.



Scan and charge - Scan the QR code on the Smappee EV Wall Business to connect and charge vehicles. Charging can also be controlled via the App.



Smappee EV Wall Business
Single or three phase power up to 22kW

Smappee intelligent load management

Included with the Smappee EV Wall Business is the hardware and integrated technology for complete energy management of the building's load demand.

Dynamic Load Balancing - Adjusts the output across all chargers to protect from circuit overload or an excess maximum demand power loading.

Smart EV Charging - The smart charging function prioritises the use of excess solar power during the day and off-peak rates overnight or on weekends. The output of the charger can even be controlled such that only excess solar power is used for charging.

Refer to Smappee Infinity on pg10.

Smappee EV Base

Model: EVB-2332-BS-E

Electrical safety protection: Built-in Type B RCD 30mA (X2)

"The Smappee EV Base is a commercial EVSE that provides an award winning minimalistic design that adds to the aesthetic design of the associated building. It also provides charging for two vehicles simultaneously at 22kW output". With integrated MID (Measuring Instruments Directive) power meters this unit can monitor charging consumption and provides detailed consumption and charging session data via the Smappee smart phone App and online dashboard.

The EVSE can be ordered with optional type 2 cables:

Type 2 socket on the EV base allows for the leads to be removed for security. leads of 5,7,10 metres can be ordered separately.

Smappee EV Base, three phase - 2 x 22 kW socket with shutter, also available with 2 x 22kW, 5m tethered cable.

The Smappee EV Wall Business electric vehicle chargers can be monitored and controlled using the Smappee online dashboard and smart phone App.

- Keep track of one, or many chargers, even across multiple locations.
- Control the state and output of chargers from anywhere with internet access.
- White-list RFID cards for security and session tracking
- Report on charging session consumption and download data to a spreadsheet for manual billing.
- Smappee monitoring & control ecosystem, add site monitoring to your charging location and enable overload protection and dynamic load balancing.

Integrated payment options

Plug and charge

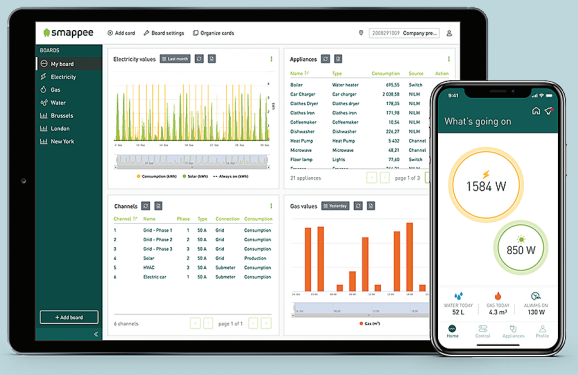
Swipe and charge

scan and charge

Smappee EV Base mount three phase - 2 x 22 kW socket with shutter.
The integrated LED lighting indicates charging status and provides ambient security lighting when not in use.

Smappee EV Base can be configured in multiple modes depending on the installations requirements:

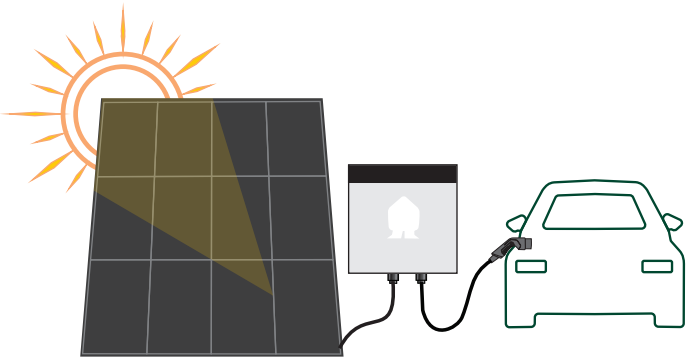
2 X 7.4 kW 230V single phase charging outlets (right and left)
2 X 22kW 400V three phase charging outlets (right and left)
1x 22kW 400 V three phase charging outlet (right left)



Smappee EV Base has built-in MID power meter and Smappee Infinity that provides the operator with an easy to use dashboard to control,manage and report EV charging operations and costs.

Smappee's Smart Charging Settings

The smart charging feature provides a set and forget solution for EV charging. In addition to standard charging where users can just plug and charge at their selected speed (1.2 - 22kW), EV owners can also choose from three different smart methods of charging their vehicle. This includes:



Smappee Solar power integration

Using energy from a home or business solar PV installation is one of the best concepts to charge an EV. This installation frees the EV charging from the power grid or energy retailer restraints, while reducing the EV charging costs to almost zero. Smappee includes the software and hardware at no additional cost to provide for the integration of solar PV into the EV charging solution.

Surplus Only –The EV Wall will charge from excess solar power and nothing else. Home battery integration is also on the way meaning users will be able to choose to charge their home battery first and then ensure the electric vehicle does not draw power from it.

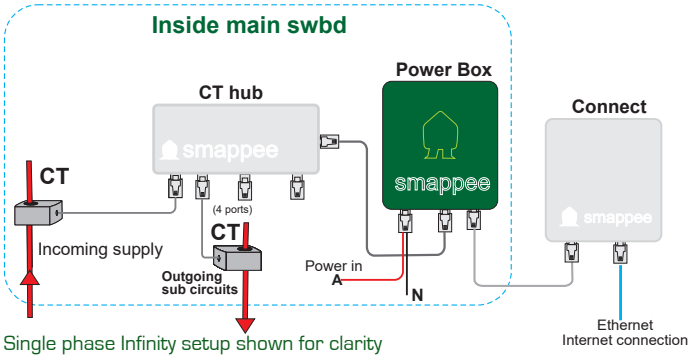
Schedules and Surplus – Users set how much charge they want to put into their electric vehicle by a certain time. E.g., 100km of charge added on weekdays by 7am. This will prioritise the use of excess solar power during the day and then off-peak rates overnight by tracking solar product and the different electricity tariffs added in the Smappee App. With schedules and surplus enabled, the EV Wall will continue charging past the set point if excess solar is available.

Schedules Only – Same as schedules and surplus. However, this option won't continue charging if excess solar becomes available. It will stick to the programmed amount of charge that needs to be added each day.

All of these features are easily setup and managed from the Smappee App or PC dashboard.

Smappee Infinity Energy Management

Smappee Infinity is a complete Load management system and comes as part of the Smappee EV charging package. Infinity can also be purchased as a stand alone energy management system for home or commercial applications.



Single phase Infinity setup shown for clarity
Three phase Infinity installation also available

Smappee Infinity is a modular energy monitoring solution, and designed to be easy to install in existing and new installations. Smappee Infinity's modular design allows you to add additional CT's through the use of CT Hubs.

Smappee Infinity is made up of four components, all components connect together with plugs in a plug and play configuration.

CT (current transformer)
Options range from 50 - 10,000 Amps

CT Hub

Power Box

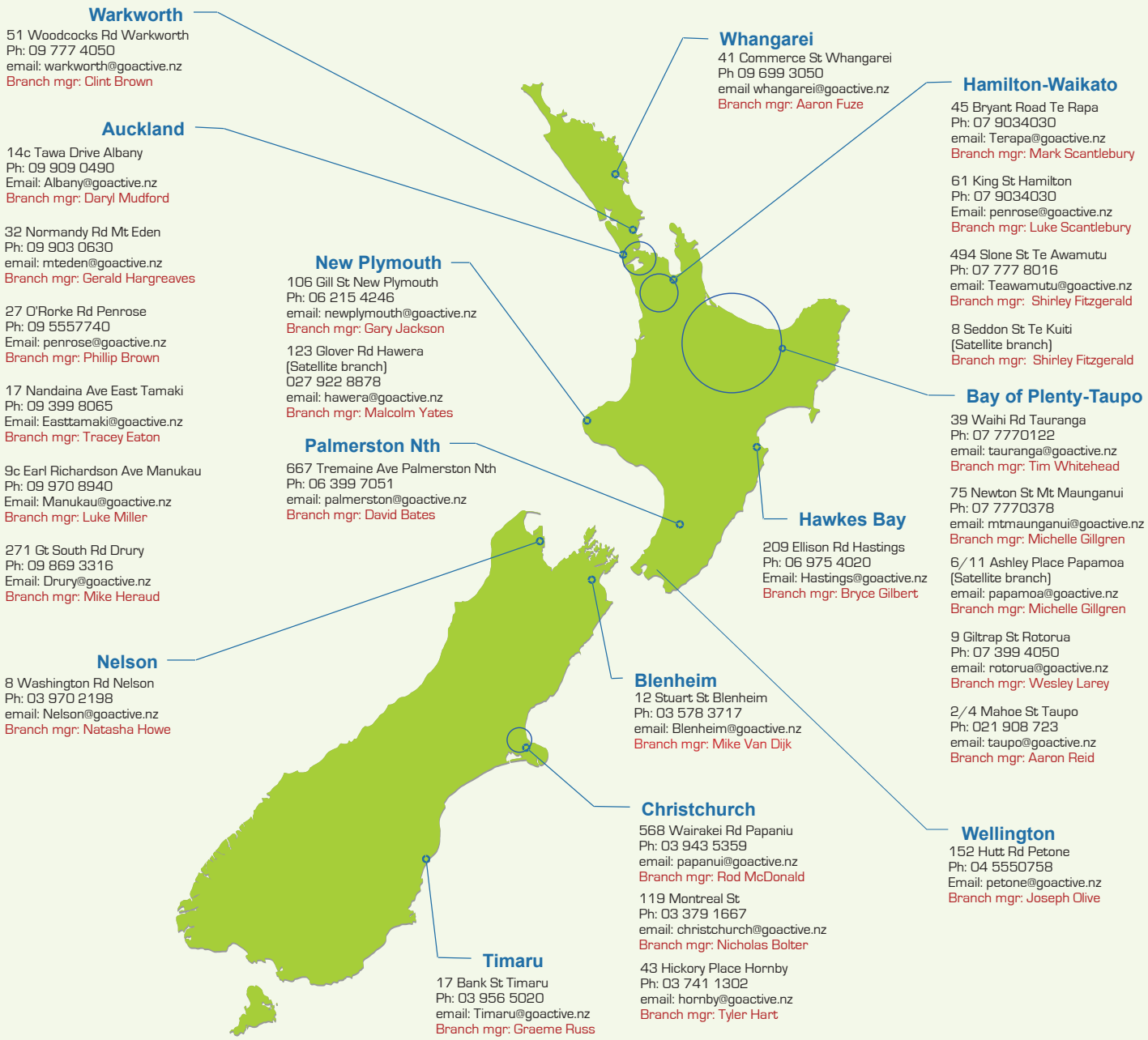
Connect

The **Connect** interfaces with a connection to the buildings router via Ethernet cable.

Data received from Connect is sent to the Smappee cloud where it is processed, and the user interface is created. This data is then available for the user to view, record and manage to optimise the power usage and EV charging operations.

Note: a separate technical brochure on Smappee Infinity is available.

Email evcharger@goactive.nz



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