



AN202101260001A

Application note

Using the 1kW to 50kW smart reversible DCDC converter for E-mobility and for Energy storage

A best quality / price ratio compared to competitors

Compared to the others similar devices, the eCNV converter is ultra-compact and noticeably light that gives the higher power density on the market. Here is some key characteristics of the eCNV converter:

Volume

eCNV = 4.8L

Competitors # 11L..15L

Weight

eCNV = 7kg

Competitors # 11kg

Power density

eCNV = 7kW/kg

Competitors # 5kW/kg

Energy density

eCNV = 10kW/L

Competitors # 4kW/L

Designed and suitable for EV applications

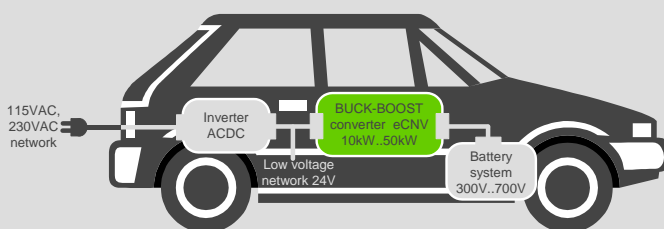
The eCNV DCDC converter is suited for multi-voltage electric architectures. The typical use-case involves an electrical vehicle (EV-vehicle) application composed of power devices connected on high and low voltage networks. It can source power as Boost, Buck, or act as a bidirectional converter. Thanks to its light weight, volume, and form factor, it can be integrated anywhere into your system and can be used in parallel configuration to increase power.



For example, in an EV-vehicle:

- when a 700V-battery is used, the eCNV converter can be used as a BUCK source giving 24V,
- when battery is charging, the eCNV converter works in BOOST mode to transfer power from a ACDC charger to the battery.

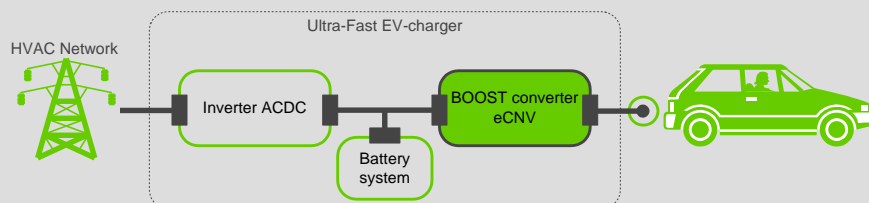
The figure shows an application for car (also for truck and bus):



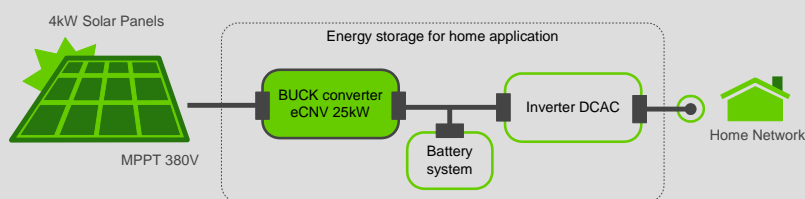
Easily usable for other applications

The eCNV converter can be used in many applications such as chargers, Power stations, HV-LV smart grids, Smart batteries. Deewex™ can bring you technical supports and solutions for your application.

As for a first example, the eCNV converter is suitable for fast ACDC charging system associated to a battery system. This deals with rapidly increasing demands to reduce the charging time for electric vehicle.



For home network, a battery gives power without being discharged with few days of back-up capacity (in case of clouds). Multiple configurations of solar panels can be used to provide energy. The eCNV converter can work as a BUCK converter to adapt the voltage to battery.



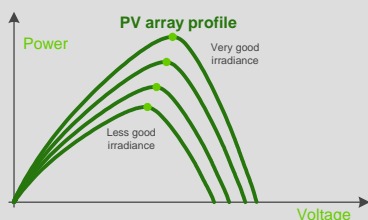
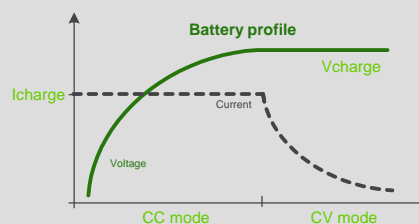
Adapted profiles of conversion for many applications

The eCNV converter can be controlled with 3 different profiles of conversion (fixed, typical, specific):

The FIXED PROFILE work with a continuous regulation under limits (proposed function on all eCNV converter)

The TYPICAL PROFILE is proposed for common application like battery systems charging/discharging, solar panels usage. They can be set according to customer parameters.

The Battery profile: CCCV algorithms for battery allow charging by the eCNV converter at constant current. Then, when the battery is nearly full, the eCNV converter voltage maintain a constant voltage, and the current decays exponentially as the battery gets 100% of state of charge.



The PV array profile: MPPT Buck-Boost algorithms have been designed as part of our different projects with expected performance greater than 90% (in a context with clouds).

The SPECIFIC PROFILE can be done regarding customer specification when the fixed profile or setting of typical profiles are not sufficient. For specific and typical profiles, Deewex™ can provide supports to determine key conversion parameters.

