Technical Factsheet

coneva Smart Charging

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Product brief

coneva Smart Charging enables charge park operators to efficiently manage small and large numbers of charging stations with regards to load balancing and peak load threshold compliance. We help our customers to transform their carpool into an electric vehicle fleet. With our solution, our customers can reliably operate even complex charging infrastructures on site by intelligently controlling the charging processes of all their electric vehicles.

Key features

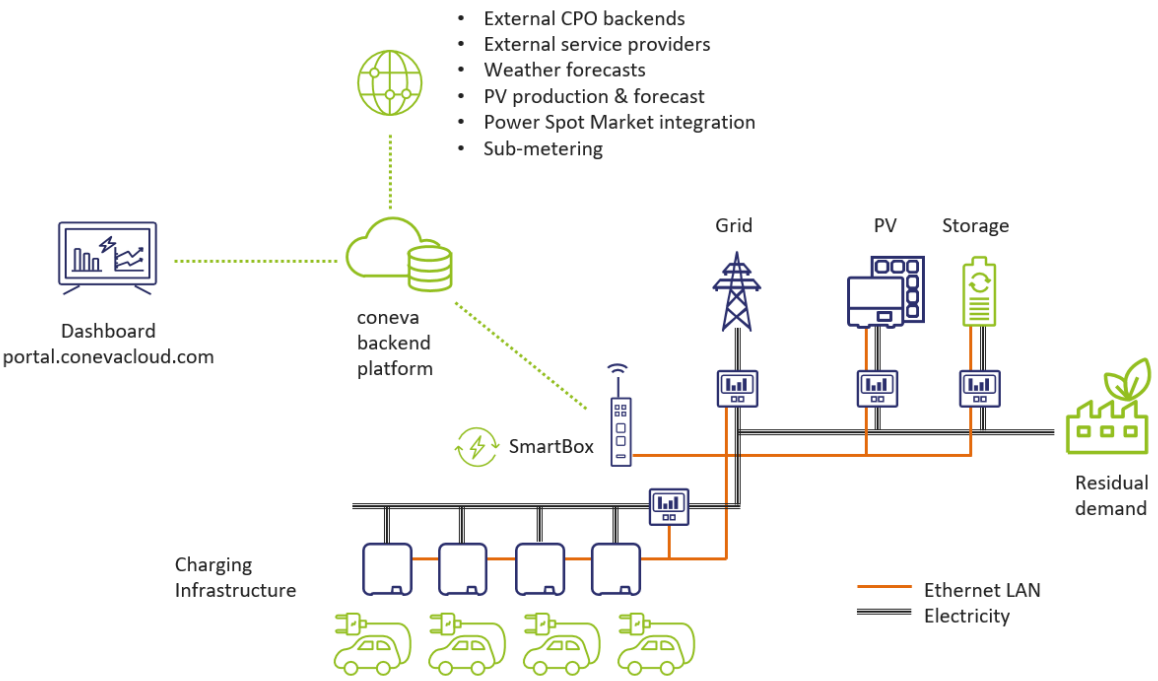
Local networking of metering and charging infrastructure, PV and storage.

Data connection via on-site Internet connection or cellular (optional)

Local energy and load management for highest availability and best energy distribution at given power limitations

Integration with local or cloud-based OCPP backend

System scheme



coneva SmartBox

The coneva SmartBox is an energy management hardware platform and consists of a Linux computer power supply, antenna and switch. On-site mounting of the components on top-hat rails in the control cabinet is possible.

Technical data

Arm Cortex-A7 dual-core 1 GHz IoT gateway with built-in TPM module, EU-region LTE Cat. 4 module preinstalled, 1 expansion slot for a Wi-Fi module, 1 CAN port, 4 DIs, 4 DOs, -40 to 70°C operating temperature

Storage: 8 GB eMMC + 2 GB DDR3L (DRAM)

OS: Industrial Linux (Debian 9, Kernel 4.4)

Antenna: If SIM card required

LAN1: DHCP client (automatically obtain IP address from customer network); autosensing 10/100/1000 Mbps

LAN2: DHCP server for charging pole network

ModBus TCP (Ethernet) & RTU (RS485)

Digital Inputs x4/Outputs x4

Certifications: UL, CE, FCC

Configuration

Configuration of all SmartBox settings can be done remotely via CoDeMan configuration tool (coneva Device Manager).

WAN communication is preconfigured (plug & play).

WAN settings (local network or cellular LTE) can be manually configured via local Web-UI, or remotely (VPN).

Compatible chargers

Manufacturer	Model	Type	Communication
ABB	Terra W22	AC	OCPP 1.6
ABL	eMH3 (3W2283)	AC	OCPP 1.6
Alfen	S-Line single	AC	OCPP 1.6
Alfen	Pro-Line single	AC	OCPP 1.6
Alfen	Pro-Line double	AC	OCPP 1.6
Alpitronic	HYC (1.5.4, 1.6.5)	DC	OCPP 1.6
ChargePoint	4100	AC	Cloud-API (CP)
Circontrol	eVolve Smarte T	AC	OCPP 1.6
Compleo /Innogy	ebox Pro Touch	AC	OCPP 1.6
Elexon	3,7 - 43 kW EP / DP	AC	OCPP 1.6
Keba	P30-X	AC	OCPP 1.6
Mennekes	Amtron	AC	Bender
Mennekes	Amedio	AC	Bender
SINEXCEL	SEC	DC	
SMA	EV Charger Business	AC	Bender
W & K	IWUK Charger	AC	Bender
Walter Werke	Smart Evo 11	AC	Bender
Walter Werke	Smart Evo 22	AC	Bender
Walter Werke	Smart Evo Pro 22	AC	Bender

Local meters

For dynamic and PV-controlled charging, the SmartBox requires at least one Modbus TCP meter to measure the power of the grid connection point. The following market-available meters are currently supported:

> Siemens PAC 2200

> Elgris Meter 100A/400A/5A

> Janitza UMG 604

> SMA DataManager

SmartBox functions	
OCPP proxy	Handles all OCPP (JSON) Communication to the charging stations via web sockets.
Local I/O manager	Handles all modbus communications with meters (non-OCPP), reads meter data (1/sec) and performs calculations.
LaMa	Load management module to set load management thresholds and to send charging plans to connected chargers.
Local backend	Receives charge point OCPP requests via proxy and performs basic OCPP functions, especially: > Configuration of RFID / authentication > Session authentication > Transaction management > Firmware distribution to chargers
CPO backend	External CPO backend (e.g., SAP, E-Flux, ChargeCloud, ...) can be connected via Websocket configuration. All OCPP data is transmitted without filtering.

Load management	coneva Smart Charging is an industry-leading solution for a variety of different load management configurations:
> Static LM	In static load management, a fixed maximum power is distributed among the charging stations. The connected charging stations are controlled via the coneva SmartBox. The charging station are controlled independent of the available capacity at the grid connection point (static).
> Dynamic LM	The charging power of the electric vehicles is aligned in real-time with the residual site / building consumption and the maximum grid connection power. The phased and/or throttled charging of electric vehicles ensures compliance with the maximum grid connection power (avoid power outage) and/or defined maximum load peaks (cost control).

> Cascade LM	In more complex systems, Cascade Load Management ensures that a maximum load is not exceeded at bottlenecks within existing sub-grids ("bad point"). The control of the charging points thus takes place in cascades in addition to the grid connection point at further bad points.
> Scheduled LM	Schedule-based load management is taking into account the electricity procurement model (time-based tariffs, spot market (day-ahead). This function ensures that the electricity required for charging is procured at optimum cost by taking grid charges and electricity prices into account when creating the charging schedule.
> PV surplus	PV Surplus Charging is preferential charging of vehicles with locally self-generated electricity from photovoltaic modules. In the event that more energy is generated than required, surplus charging can provide the excess solar power in the BEV.
> Smart grid	The Smart Grid Interface utilizes reduced grid charges through grid-serving control in accordance with §14a EnWG. The charging management system can help to avoid overload situations in the distribution network by giving the network operator the possibility to control the available connected load.
> VIP charging	With the VIP function, selected charging stations or specified RFID cards can be charged with higher priority. In the event of a necessary limitation of the charging power, VIP sessions are supplied with the highest possible charging power whereas other sessions are provided with the residual power.