How to manage electric vehicle charging within energy availability of the building infrastructure?

Product application sheet
EVlink Load Management System

Monitor, control and maximize EV charging based on the real-time available power in your building.

- Peace of mind: Maximized continuity of service all while providing fair and controlled EV charging services
- Cost effective: No subscription costs, Minimum infrastructure upgrade, On-peak/off-peak tariff settings
- Connected offer: Connection to embedded dashboard for supervision and control, to a CPO backend or to BMS
- Upgradeable and scalable: Upgrade to a higher level software license to adapt to your evolving EV charging needs

EVlink Load Management System is the perfect solution for fleets, private company parking or condominiums to enjoy EV charging services all while ensuring an optimized use of energy and a cost-effective and sustainable operation.

EVlink Load Management System is a Solar Impulse Efficient solution.
How to manage EV charging within energy availability of the building infrastructure?

Energy management

How to optimize the impact of consumption of EV charging infrastructure on an electrical installation

The problem

Initial situation

Solution without energy management

Increase of subscribed power

The installation of charging stations in an existing electrical installation can have a significant impact due to the power level required by electric vehicles to charge.

This solution consists of increasing the power subscribed to the energy supplier to maintain the same consumption model. It implies an increase in the cost of the subscription and does not guarantee that the trigger threshold will never be exceeded. Thus the continuity of service of the building is not guaranteed.

Energy management: why do it?

- Avoids facility disruption, causing operating losses
- Reduces power and electrical infrastructure costs
- Makes operations more efficient
- Increases driver satisfaction.
Schneider Electric solutions

Static energy management

Dynamic energy management

Setpoint "D" is adjusted in real time according to the consumption of the rest of loads in the building, to maximize the power allocated to charging electric vehicles.

Setpoint "D" is fixed. The power is distributed between all connected vehicles.

Defining maximum power with a dynamic or static current setpoint

1. Metering the facility and charging stations consumptions

2. Algorithms to allocate power to electric vehicles based on real-time needs and availability
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**How it works**

**Flexible, simple, cost-effective solution**
- From less than 5 to up to 1000 charging stations managed
- With an intuitive operation dashboard to manage the entire installation
- Upgradeable from one software license to another to adapt to evolving EV charging needs
- Compatible with open protocol OCPP 1.6 Json, facilitating integration to other systems
- Allows the management of user badges without having to subscribe to a complementary supervision system.

**Easy installation, commissioning & maintenance**
- Webserver including a configuration assistant that walks the installer through the different steps to configure the system
- Automatic scan and configuration of charging stations, all in parallel to save time
- Easy firmware update, with last firmware release available on se.com
- Registering and download of log records.

**Multiple functionalities for efficient operation**
- Time-of-use electricity tariff scheduling to limit EV charging when electricity price is high, and to maximize it when it is low (depending on the selected model)
- Privileged (VIP) user badges or charging stations, that will not be load-shed, or just when strictly necessary to ensure building power continuity (depending on the selected model)
- Registering and download of EV charging transactions for analytics, cost allocation or invoicing
- Compatible with CPO backend supervision for user access, billing, and other services if needed
- Offers integration capabilities to Building Management System (BMS) (may require specific development).

**Load reduction and load shedding operation**

EVlink Load Management System (EVlink LMS) controls the EV charging infrastructure. It allows to limit the instantaneous power drawn by the entire set of connected electric vehicles, and manages the power allocated to each one of them. In real time, it transmits a setpoint to each charging station, which transfers it to the vehicles. In the case that the power demand from the vehicles exceeds the maximum setpoint, EVlink LMS applies a reduction on the power available to charge the vehicles in a proportional manner (equal percentage) to all of them.

When the load shedding is triggered, the algorithm allows to distribute the available energy according to 2 strategies (depending on the settings):
- **Based on the energy already consumed:** the system suspends the charging of the vehicles that have obtained the higher amount of kWh since the start of their charging, favoring new vehicles
- **Based on the connection time:** the system suspends the charging of the vehicles with the longest charging time favoring those last arrived.

In both cases, the system rechecks and updates the situation every 15 minutes.
Features

EVlink LMS references

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(1) Via the management of up to 9 slave EVlink Load Management System
(2) To upgrade from a current commercial reference to a higher-level one, please consult us.

Functions performed by all commercial references of EVlink LMS

Access Management

Add, modify, delete, supervise badges

Commissioning

Commissioning all charging stations directly from EVlink LMS

Save & restore commissioned configuration

Operation

Supervision through real time dashboard and remote actions on charging stations

Charge data report export

Maintenance report export

Connectivity

Connection with CPO supervision (OCPP 1.6 Json)

Connection with EcoStruxure supervision (web services) (1)

Optional: 3G/4G modem

Commissioning by Ethernet cable

(1) May require specific development

Dimensions

Rear view

1- USB1 (USB 2.0) 6- USB2 (USB 2.0)
2- HDMI port 7- GPIO
3- ETHER1 (10/100/1000 Mbits/s) 8- DC power connector
4- COM port RS-232/422/485
5- Ground connection pin
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Architectures

IT network topologies

**STAR**

Star connection using basic switch part number TCSEBU083FN0. Non manageable

**RING**

Ring connection with manageable switch part number TCSEBU083F3F0 or TCSELU043F23F0

**DAISY CHAIN**

This topology is not recommended since it does not ensure optimum continuity of service

Charging stations and power meters compatibility

**EVlink charging station compatibility**

- **Smart Wallbox**
- **Parking**
- **DC Fast Charge**

**Power meter compatibility**

- **IEM 3x5x MODBUS RTU/TCP**
- **PM5320 MODBUS RTU/TCP**
- **PowerTag**
  - Via Smartlink gateway (Zigbee to MODBUS TCP)
- **ComPact NSX MODBUS TCP**
- **MasterPact MTZ MODBUS TCP**

ARCHITECTURE EXAMPLE

EVlink LMS

Perform data acquisition and runs the algorithms to control total demand and power allocation to the vehicles.

Power Meter

Real-time measurement of total building or electrical panel consumption in order to dynamically communicate the energy available.

Modem 3G/4G

To connect to remote OCPP monitoring, or to access the operation dashboard remotely.

Switch ConneXium Ethernet

Ethernet network

Power supply

Star connection using basic switch part number TCSEBU083FN0. Non manageable

Ring connection with manageable switch part number TCSEBU083F3F0 or TCSELU043F23F0

This topology is not recommended since it does not ensure optimum continuity of service
The monitoring is local, with no cloud subscription requested.

EVLink Load Management System centralizes the data from all chargers on an intuitive and ergonomic user interface and allows to:

- Visualize a dashboard showing in real time the status of each charger
- Start/stop a charging session
- Manage badges (local addition, import, export) and user rights
- Monitor and download transactions history per charging station or aggregated for the infrastructure
- Consult and download maintenance data
- Configure the connection to a remote supervision
- Set parameters: Add/Remove chargers, update them and change their configuration
- Save and restore commissioned configuration
- With an administrator profile, access and modify all system settings.

I can have a holistic view of my charging stations, their status, their transactions and I can launch remote actions on each of them.
Monitoring: an intuitive user interface

I can easily manage users access rights

I can limit EV charging when electricity prices are high and maximize it when they are low