

vSEClib Family

Software Libraries for Charging Station Controllers

What is the vSEClib Family?

vSEClib (Supply Equipment Communication Controller Library) is a family of software libraries for smart charging stations. The family consists of different libraries which cover the high-level communication between the charging station, the electric vehicle, the power electronics and the back end (CSMS). Each software stack can be integrated into your charging station controller completely independent from the other software stacks.

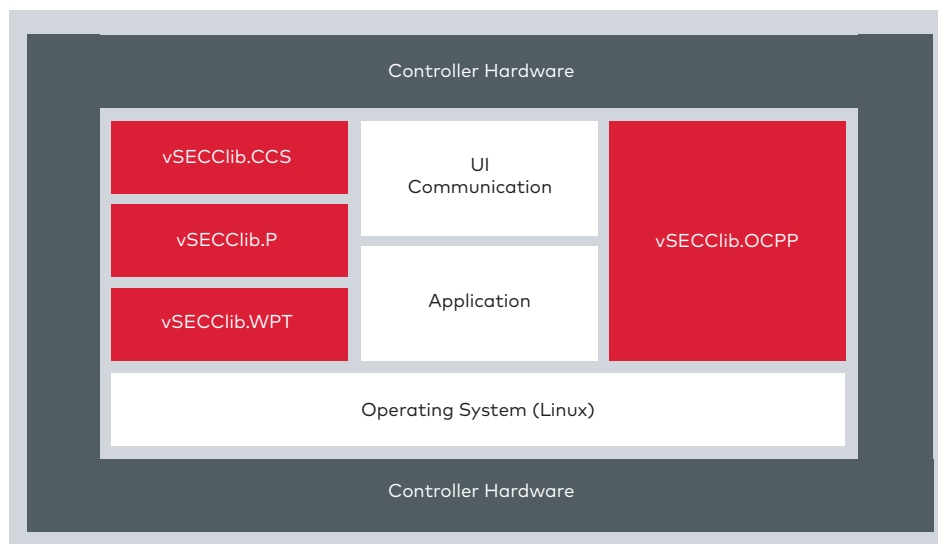
Different Libraries - Individually Integrated

Vector supports developers with embedded software to easily ensure the standard compliant implementation of communication functions. Each software library enables the rapid and sustainable development of smart charging stations: The .CCS stack already contains the logic for AC and DC charging communication via CCS according to ISO 15118 (including -20) and DIN SPEC 70121. With the .OCPP library, customers can implement the message handling between the controller and the CSMS according to OCPP 1.6J and 2.0.1. Further libraries are vSEClib.P for pantograph and vSEClib.WPT for wireless charging.

Overview of Advantages

- > Simplified development of communication software for charging stations
- > ISO, DIN and OCPP interfaces ready for implementation
- > Mature software components with high reliability
- > Reduced time to market with easy integration for new standards
- > Standard compliant communication between the charging station, the vehicle and the backend
- > Hardware independent C/C++ libraries, compatible with all Linux-based systems
- > Regular updates to meet standards under development
- > Be the first to implement the latest standards (e.g. ISO 15118-20, OCPP 2.0.1)
- > Developer-friendly integration and logic

More information: vector.com/vsecclib



Currently available vSEClib libraries that can be integrated separately into the controller.

vSECClib.CCS

- > Smart charging software stack for AC and DC charging
- > Implementation of ISO 15118-2, -3, - 20 and DIN SPEC 70121
- > Includes SLAC handling
- > EXI en- and decoding and XML security module included
- > Authorization via EIM and PnC
- > AUTOSAR and RTOS compatible
- > Includes specific messages to enable bi-directional power transfer

Available options

- > **.PnC** including signature generation and validation services
- > **.BPT** prototype, according to ISO 15118-20
- > **.ACD** with further ISO 15118-20 implementation

Advantages

- > Future-proof with ISO 15118-20 implementation
- > Improved error handling and schema validation
- > Easy debugging, user-friendly logic
- > Small memory usage
- > Developer-friendly integration of C++ library
- > Supports various PLC chips to ensure hardware independence

vSECClib.P

- > Smart charging software stack for pantograph charging
- > High power opportunity and depot charging for buses

Available options

- > **.UP** (ISO 15118: Panto-Up)
- > **.DWN** (OppCharge: Panto-Down)
- > Communication via wireless access point
- > No user interaction required for charging

vSECClib.OCPP

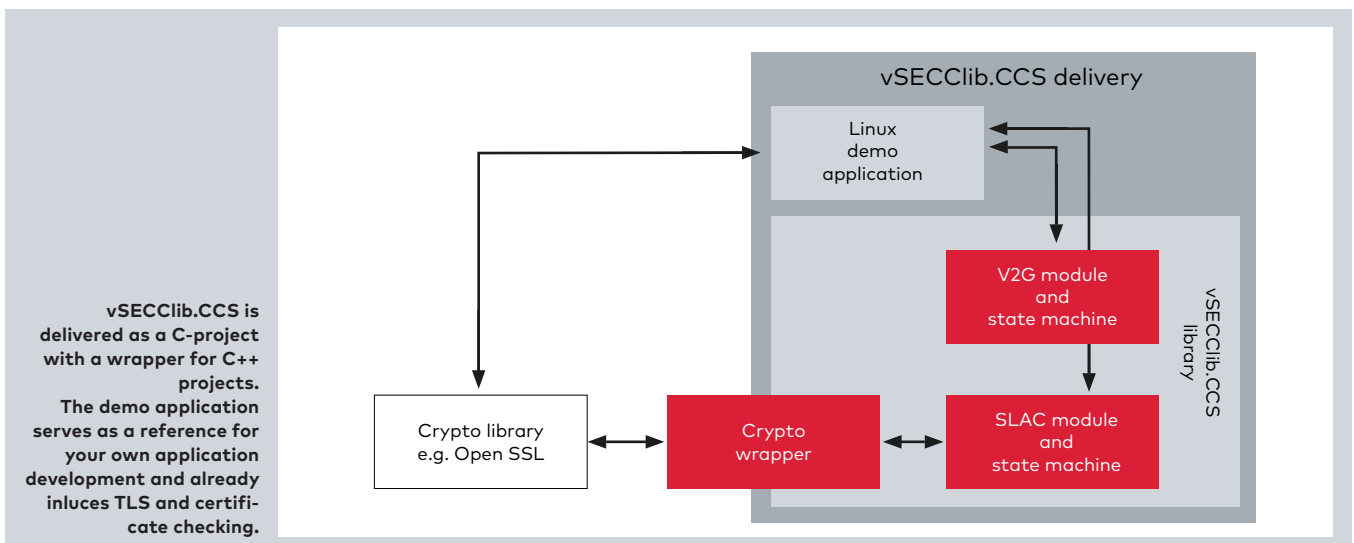
- > Smart charging software stack for back end communication
- > Supports full OCPP 1.6J and 2.0.1 message set
- > Automated OCPP message handling including protocol-specific requirements and restrictions
- > Full device model implementation with easy access

Advantages

- > Easy to use interface for complex OCPP use cases
- > Error handling and JSON schema validation
- > High performant C++ library
- > Autonomous monitoring of variables in a charging station (e.g. temperature)
- > High flexibility, efficiency and portability
- > Flexible adaptation of message handling by customer application
- > Includes business logic for Plug and Charge

vSECClib.WPT

- > Smart charging software stack for wireless power transfer
- > First implementation of inductive charging
- > Implementation of ISO 15118-20 DIS (2018)
- > Linux sample application included
- > AUTOSAR and RTOS compatible



Glossary

ACD: Automatic Connection Device
BPT: Bidirectional Power Transfer
CCS: Combined Charging System

CSMS: Charging Station Management System
DIS: Draft for International Standard
EIM: External Identification Means
OCPP: Open Charge Point Protocol

SECC: Supply Equipment Communication Controller
UI: User Interface
PE: Power Electronics
WPT: Wireless Power Transfer