Getting Started Information

E-Mobility StarterKit

Content

Important Notice

Please read the safety instructions in this package before getting started!

Unboxing has never been more exciting for eMobility infrastructure newcomers. This video shows you how easy it is to get started in the development of smart charging stations with our Starter Kit

- Watch here

Safety Instructions

1. Safety Instructions and Hazard Warnings

Caution: In order to avoid personal injuries and damage to property, you must read and understand the following safety instructions and hazard warnings prior to installation and use of the product. Provide this documentation (manual) to every user of the product.

2. Proper Use and Intended Purpose

Note: The Supply Equipment Communication Controller vSECC is used for communication between the charge controller of the vehicle to be charged and the supply equipment via the charging cable and Type 2 CCS plug connections provided for this purpose. Based on the received and transmitted information, messages for interaction with the supply equipment operator and for controlling the power electronics are exchanged with other components of the supply equipment. The controller also sends messages to the back end of the charging station, the Charging Station Management System.

Caution: The product is designed for permanent, fixed installation in closed control cabinets and stationary charging equipment. The installation environment must be dry and protected from the weather.

Caution: Only specifically qualified, trained and authorized personnel is allowed to install, set up, configure and operate the product to prevent accidents from hazardous electrical voltage or electrical power. Access to operating products must be limited to authorized personnel at any time. The housing of the product must always be assembled during operation.
The device may only be used with appropriate connectors. The connectors of the vSECC may only be used and operated within the specified range, the information in the manual must be observed.

Note: The product can be integrated into an existing IT infrastructure. The configuration of the respective parameters and IT security is the responsibility of the customer.

Caution: vSECC contains components and circuits that communicate with other components and circuits that can store and transform energy. The user has to take care of the resulting dangers and make a separate risk assessment. The device may only be operated within the specified temperature range.

Caution: Electrical safety and data security of the Supply Equipment must be assured by separate means and is not in scope of the product. In particular, effective measures must be taken to avoid damage and injury caused by overload or short circuit in the electric power installation independent from the vSECC.

Caution: Neither the monitoring of residual current and insulation, relay monitoring (main conductor), especially sticking of the conductors; nor the cooling function (use of the temperature sensors for monitoring), monitoring of battery and wire and the performance limits in the vehicle; nor the monitoring of power electronics incl. contactors (especially emergency shutdown devices) is in the scope of the product and must therefore be assured by separate means.

Safety Instructions

3. Foreseeable Misuse

Caution: vSECC does not comply with the directive 2014/34/EU and must therefore not be used in explosion critical areas.

Installation in mobile equipment or operation without adequate protection against weather and moisture is not allowed. The electrical safety of the supply equipment is not in the scope of the vSECC functionality and must be assured independently by suitable measures such as insulation monitoring, residual current detection, overload protection and circuit breaker. It is not permitted to use the device for purposes other than controlling the charging communication. Interventions or changes to the device are not permitted.

The vSECC may only be installed and operated by qualified and instructed personnel, who is familiar with the contents of this document and must have access to it at all times.

4. Hazards

Caution: Supply Equipment operates under high voltage which could also occur at the product in case of failure and cause heavy injury and damage. Wrong configuration and/or operation of the product may cause failures of the Supply Equipment leading to personal injury or damage to property.

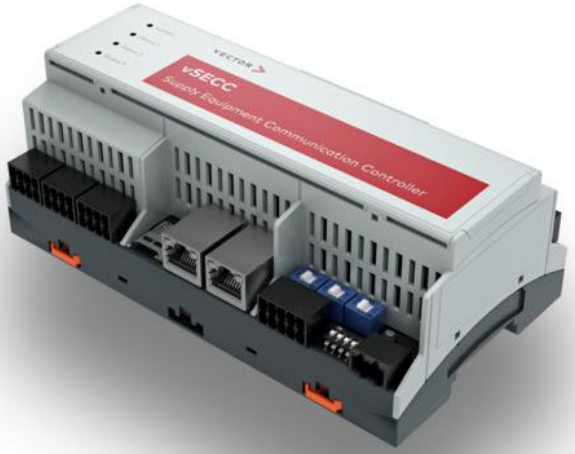
Comply with safety standards and public regulations which are relevant for the operation of the system. Before you can operate the system in public areas, it should be tested on a site which is not accessible to the public and specifically prepared for performing tests in order to reduce hazards.

5. Disclaimer

Caution: Claims based on defects and liability claims against Vector are excluded to the extent damages or errors are caused by improper use of the controller or use not according to its intended purpose. The same applies to damages or errors arising from incorrect mounting, insufficient training or lack of experience of personnel using the controller.

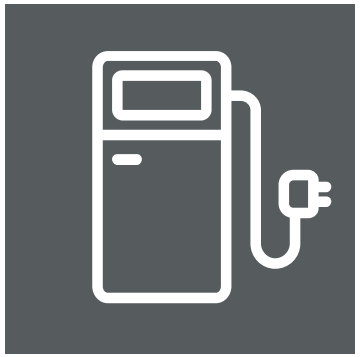
Included in the E-Mobility StarterKit

- 2x vSECC Communication Controller
  (SW Version: 2.8)
  - Connectors that allow wiring without any crimp clamps
  - Connector pin assignment diagram/table
  - Documentation
    - vSECC User Manual (online)
    - Protocol description of power electronics interface (online)



- vCharM Charging Station Management System
  6-months test license
  - Hosted in the Cloud
  - Pre-configured system for configuration and management of the vSECC Controllers
  - Documentation
    - vCharM User Manual (online)

Many Applications with One Device



CCS (DC)

+

One optional Connector

CCS (AC*/DC)

CHAdeMO

Roof-Mounted Pantograph

Directional Antenna

WLAN Access Point

Inverted Pantograph

Digital I/Os

CP / PE

Connector Options for vSECC

User Interface

LEDs

RFID

Display

Discrete

MQTT

vSECC

OCPP

HTTP

Backend

Charging Station Management

Value Added Services

Power Electronics Protocol

Emergency Line

Power Electronics

Energy Meter

Modbus Slaves (e.g. IMD)

High Voltage Lines

CAN

PLC

Ethernet IP

Other

RS232/RS485

*under development

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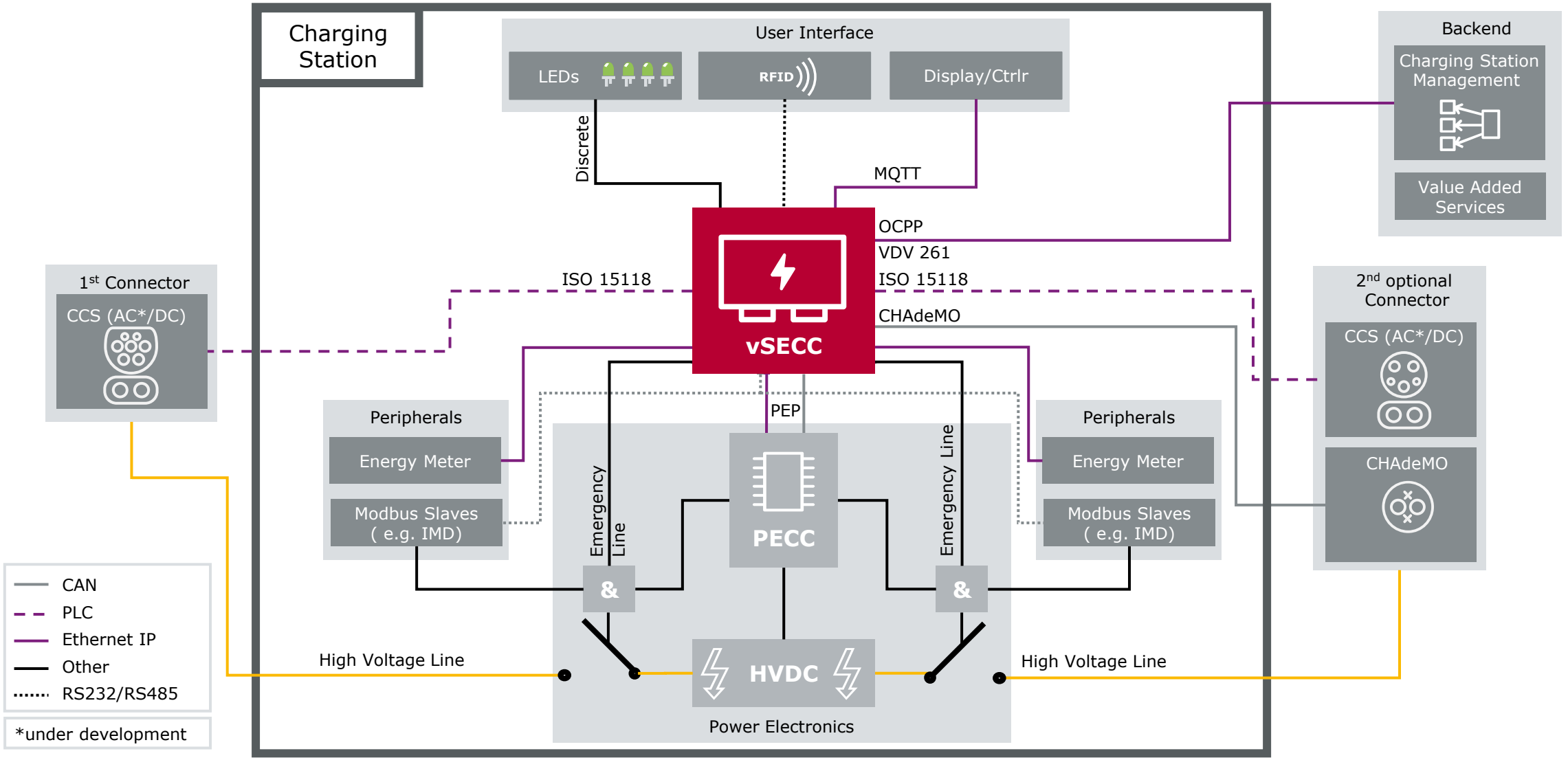
Available Interfaces of vSECC

- Ethernet
  - HTTP: Hardware configuration and rescue interface
  - OCPP 1.6J and 2.0.1: Management interface between vSECC and vCharM (or other back end)
  - PEP-WS 1.9: Websocket interface to Power Electronics

- CCS
  - PWM-CP for basic signaling (IEC 61851)
  - PLC for high level communication (DIN SPEC 70121 & ISO 15118 DC EIM)

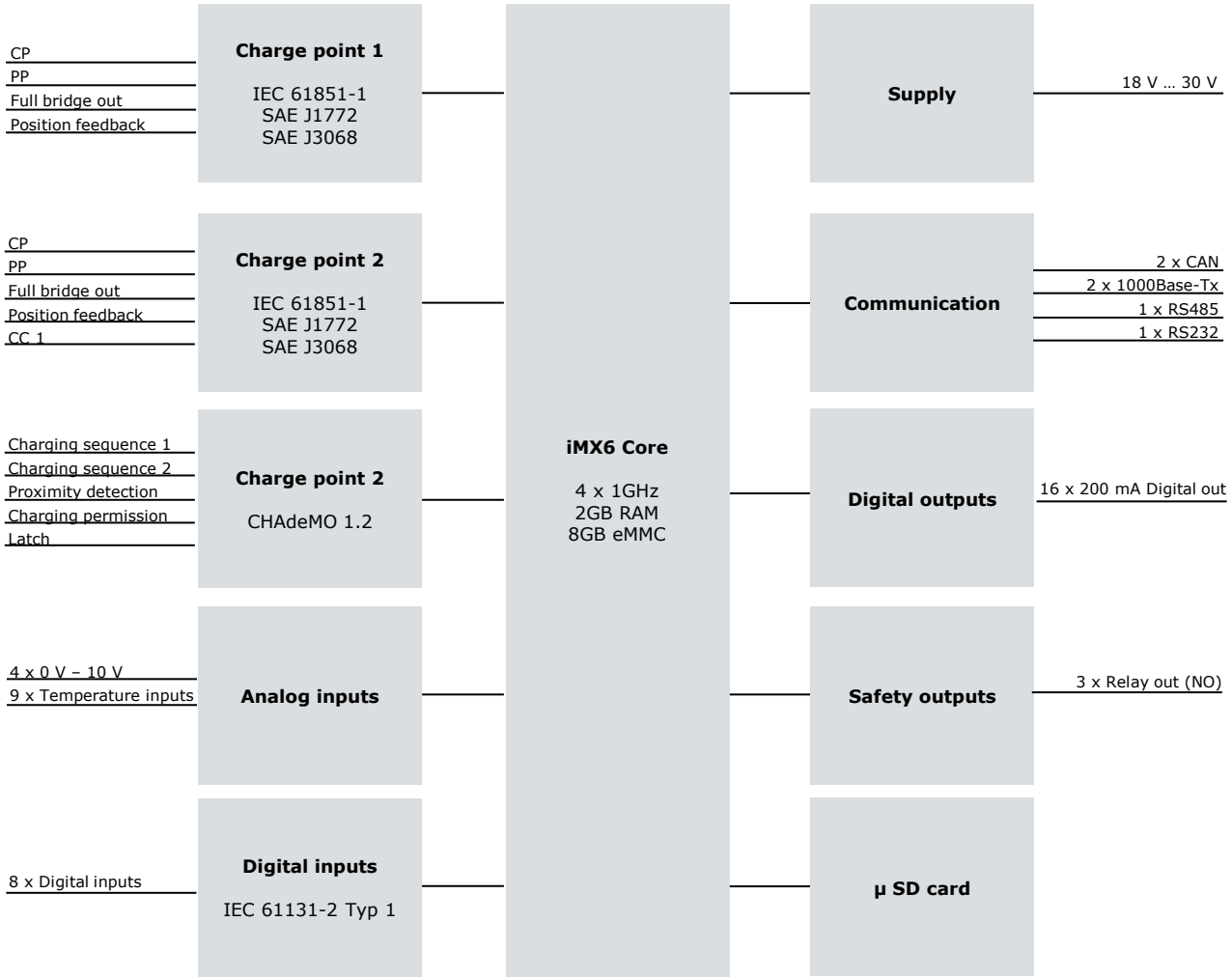
- CAN
  - Communication to the vehicle via CHAdeMO v0.9 or v1.2
  - PEP-CAN 1.4: CAN interface to Power Electronics

Interfaces Inside Conductive Charging Station



Hardware Details

Main-CPU	i.MX 6Quad Core 4 x 1 GHz, 2 GB RAM, 8 GB eMMC
Power supply	18 V – 30 V DC
Communication	2 x CAN 2 x 1000Base-T / 100Base-TX 1 x RS232 1 x RS485
Charging interfaces	Max. 2 charge points simultaneously Charging standards considered DC: IEC 61851-23 DIN SPEC 70121 ISO 15118-2/-3/-20 OppCharge 1.3 SAE J1772 CHAdeMO v0.9, 1.2
Charging environment	2 x fullbridge out (Imax = 1 A) 2 x analog input position feedback
Digital inputs	8 x IEC 61131-2 Type 1 digital input
Analog inputs	2 x 0 - 10 V analog input 9 x temperature sensor input
Safety output	3 x relay output (NC)
Digital output	16 x digital out (Imax = 200 mA)
Connectors	2 x RJ45 92 x METZ AST series (spring clamp)
Housing dimensions (L/B/H)	162 mm x 89,7 mm x 62,2 mm (plastic)
Technical usage and storage requirements	Temperature: -40 °C to +70 °C Altitude: 0 – 2000 m above sea level Humidity: Not condensing
IP protection class	IP20



vSECC Connectors Layout

- X300: CHAdeMO

1 CHD SEQ1	3 CHRG PER	5 LATCH OUT	7 GBT CC1
2 CHD SEQ2	4 PROX DET	6 LATCH IN	8 PE

- X301: Analog In and Temperature Sensor Connectors

1 0-10V 2	3 AGND	5 AGND	7 TEMP 8	9 AGND	11 TEMP 6	13 AGND	15 TEMP 4	17 AGND	19 TEMP 2
2 0-10V 1	4 TEMP 9	6 AGND	8 TEMP 7	10 AGND	12 TEMP 5	14 AGND	16 TEMP 3	18 AGND	20 TEMP 1

- X302: CCS Charging Connector 2

1 M1a	3 FB1	5 PP1-PU	7 CP1
2 M1b	4 GND	6 PP1	8 PE

- X303: CCS Charging Connector 1

1 M2a	3 FB2	5 PP2-PU	7 CP2
2 M2b	4 GND	6 PP2	8 PE

- X304: Safety Outputs

1 REL1b	3 REL2b	5 REL3b
2 REL1a	4 REL2a	6 REL3a

- X305: CAN / Serial Interfaces

1 CAN1 H	3 CAN1 L	5 GND + 6 GND	7 RS485 B	9 RS485 A
2 CAN2 H	4 CAN2 L		8 RS232 TXD	10 RS232 RXD

- X306: Digital In and Digital Out

1 +24V	3 CN2 START	5 PANTO DOWN	7 CN1 STOP	9 DIN1	11 OUT15	13 OUT13	15 OUT11	17 OUT9	19 OUT7	21 OUT5	23 OUT3	25 OUT1
2 CN2 STOP	4 PANTO ERR	6 PANTO UP	8 CN1 START	10 PANTO CTRL	12 OUT14	14 OUT12	16 OUT10	18 OUT8	20 OUT6	22 OUT4	24 OUT2	26 GND

- X307: Power supply

1 Sup GND	1 Sup 24V

- ETH1 and 2: RJ45 Ethernet connector

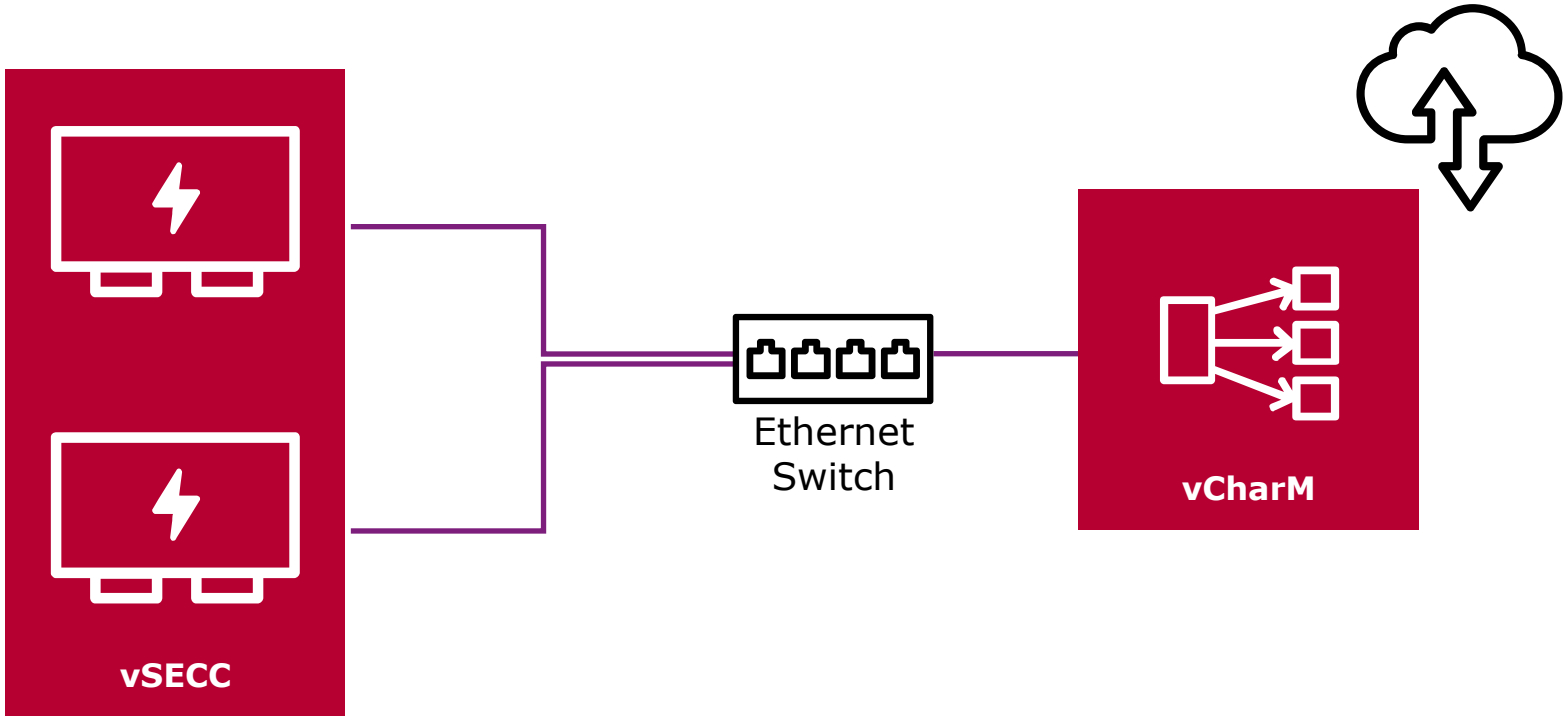
Configuration Setup

IPv4 addresses:

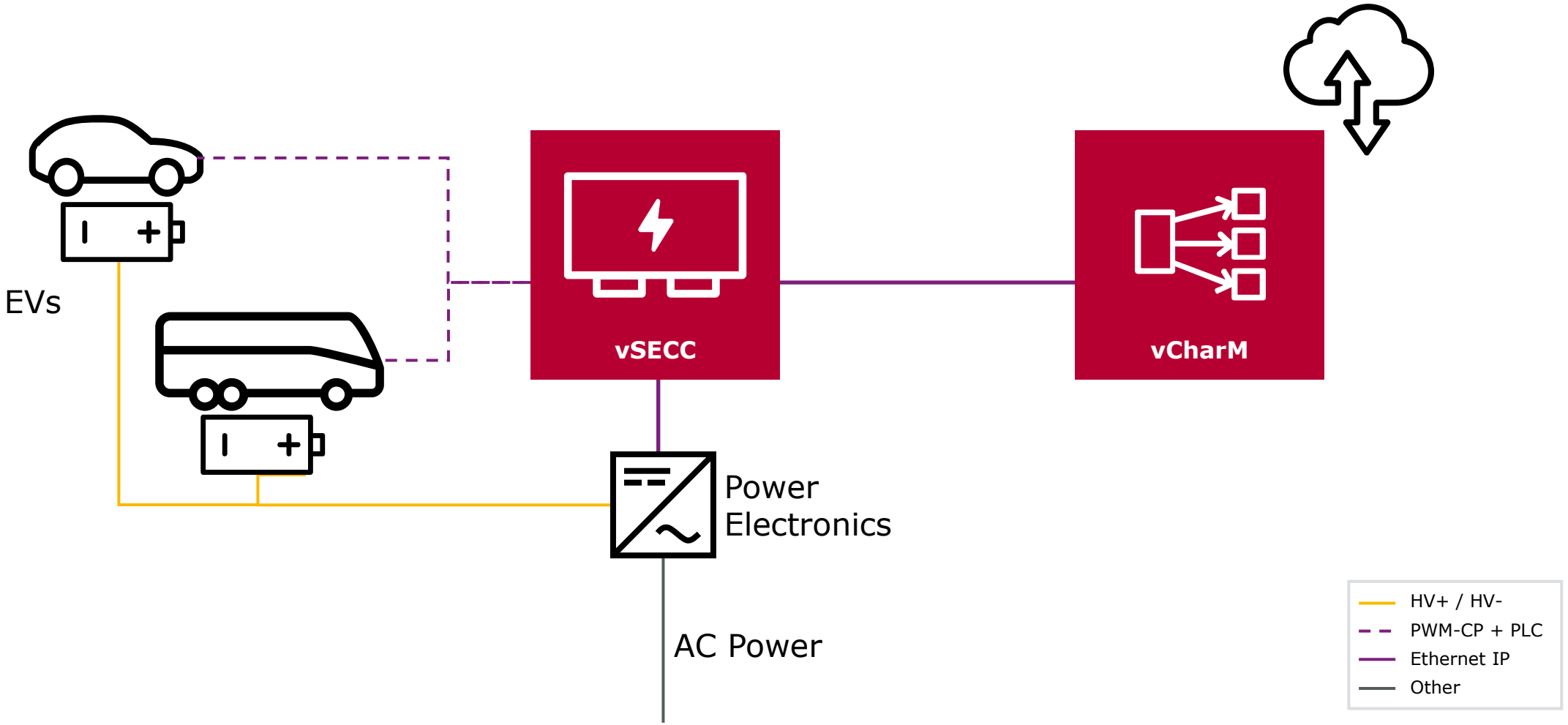
vSECC 1: 192.168.3.11

vSECC 2: 192.168.3.12

Subnetmask: /24



Proposed Evaluation Setup



Step 1

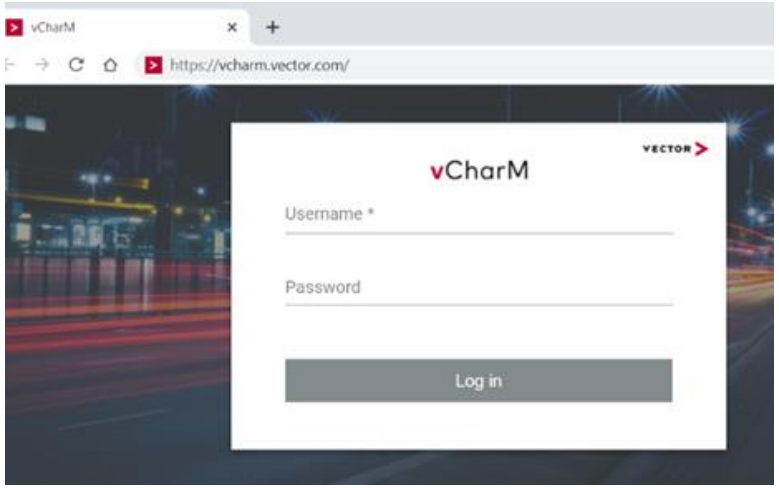
Log in to our user front end using the provided credentials:

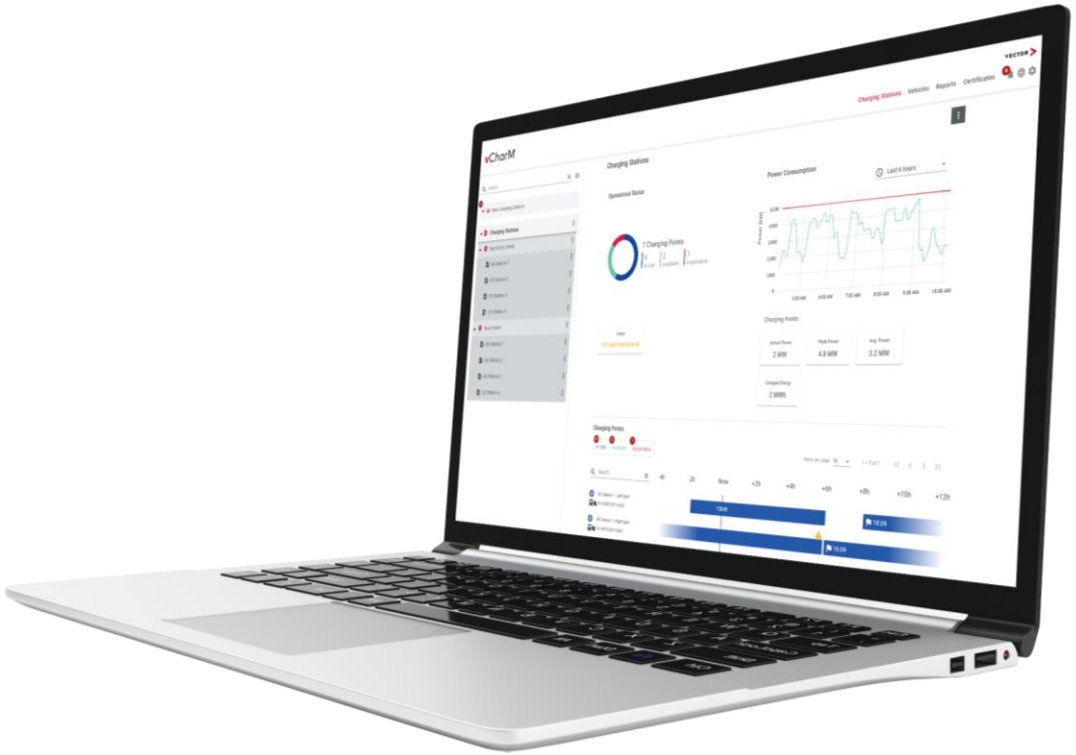
https://vcharm.vector.com

Use one of the recommended browsers:

- Google Chrome 102 (64-Bit)
- Firefox Browser 100 (64-Bit)
- Microsoft Edge 101 (64-Bit)

Please do not use Microsoft Internet Explorer.





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Step 2

Connect the vSECC to vCharM.

If you want to connect a charging station, it must support OCPP1.6J, OCPP2.0 or OCPP2.0.1.

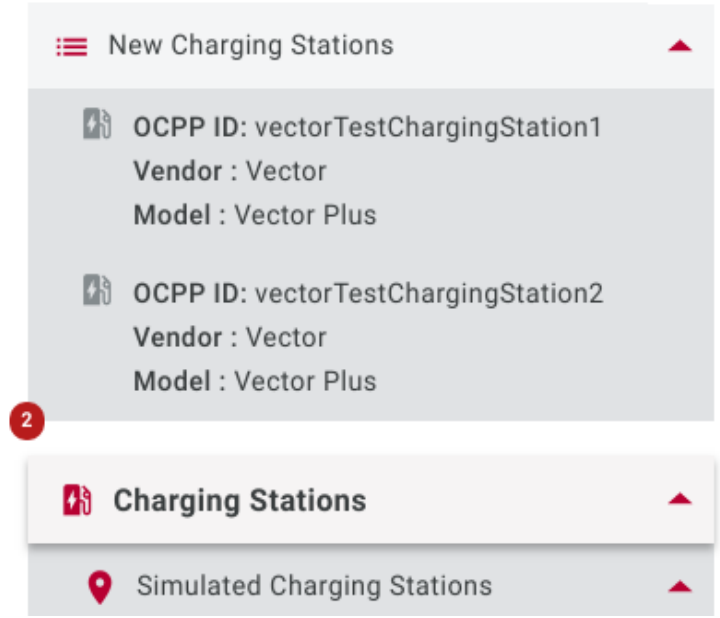
The vSECC is already pre-configured and can be connected to vCharM.

Use the following settings in another charging station to set-up the connection:

URL:
wss://ws.vcharm.vector.com/ocpp/<tenantId>/<chargingStationId>

Authorization Type: Basic Auth
Username: same as for front end
Password: same as for front end

A new dialog appears in the *Charging Stations* view which can be used to add the vSECC / charging station to the configuration.



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Step 3

For using the vSECC in other scenarios and for configuring e.g. the connection to Power Electronics, open the vSECC web interface by entering the vSECC's IP address in a web browser.

vSECC 1: http://192.168.3.11

vSECC 2: http://192.168.3.12

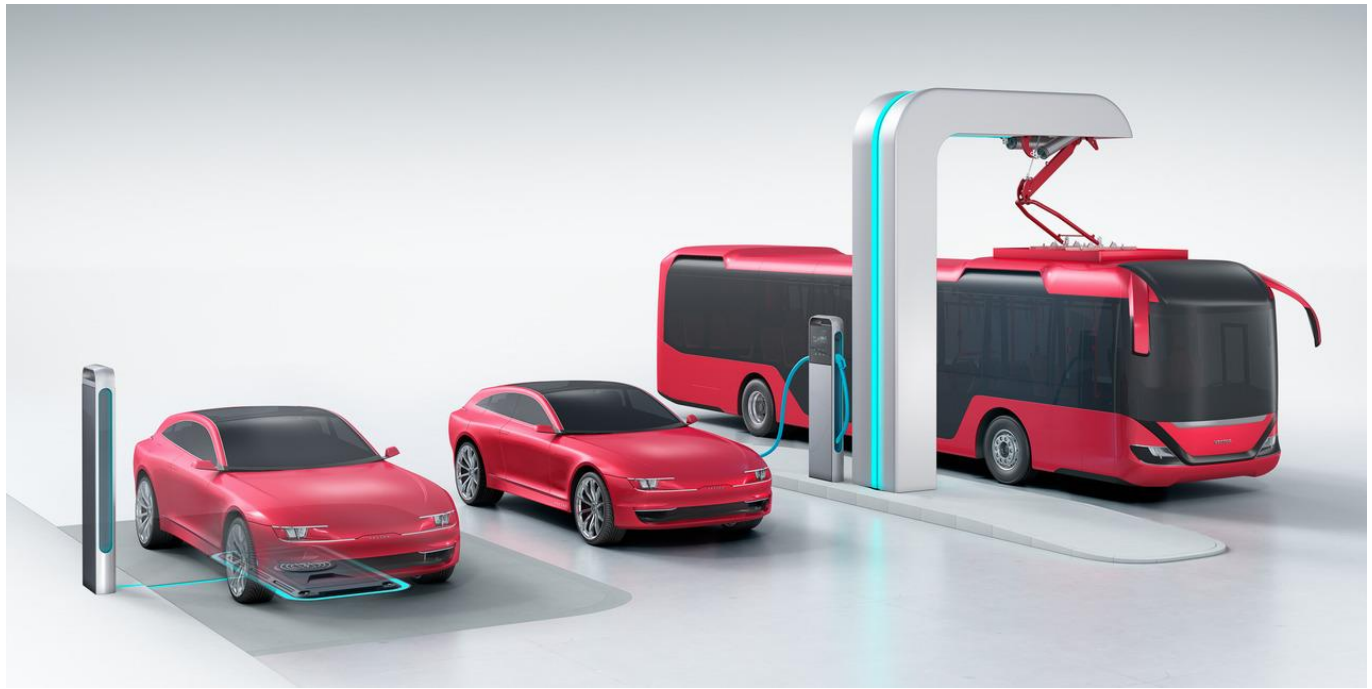
Please refer to the vSECC User Manual for further information on how to configure the vSECC.

Happy evaluation!

Let us know about your experience with the Starter Kit.
We appreciate any kind of feedback.

If you need support or if you are interested in further information or an offer, please do not hesitate to contact us at

offboardcharging@vector.com



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OCPP Interoperability vSECC – vCharM

Implementation Matrix vSE Starter Kit OCPP 2.0.1 Use cases (OCPP-2.0.1_part2_specification) and matching OCPP 1.6J messages	**Implemented in**	
Use Case	**vCharM**	**vSECC**
A. Security		
A01 - Update Charging Station Password for HTTP Basic Authentication	✓	✓
A02 - Update Charging Station Certificate by request of CSMS	✓	✓
A03 - Update Charging Station Certificate initiated by the Charging Station	✓	🕒
A04 - Security Event Notification	✓	
A05 - Upgrade Charging Station Security Profile	**2023**	
B. Provisioning		
Booting a Charging Station		
B01 - Cold Boot Charging Station	✓	✓
B02 - Cold Boot Charging Station - Pending	✓	✓
B03 - Cold Boot Charging Station - Rejected	✓	✓
B04 - Offline Behavior Idle Charging Station	✓	✓
Configuring a Charging Station		
B05 - Set Variables	✓	✓
B06 - Get Variables	**X**	✓
B07 - Get Base Report	✓	✓

🕒 Will be scheduled
* OCPP 2.0.1 only

Versions: vSECC 2.8 – vCharM 2.8

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OCPP Interoperability vSECC - vCharM

Use Case	vCharM	vSECC
B08 - Get Custom Report	X	🕓
B09 - Setting a new NetworkConnectionProfile	**2023**	
B10 - Migrate to new ConnectionProfile	**2023**	
Resetting a Charging Station		
B11 - Reset - Without Ongoing Transaction	✓	✓
B12 - Reset - With Ongoing Transaction	✓	✓
C. Authorization		
Authorization options		
C01 - EV Driver Authorization using RFID	✓	✓
C02 - Authorization using a start button	✓	✓
C03 - Authorization using credit/debit card	🕓	(✓)
C04 - Authorization using pin-code	✓	X
C05 - Authorization for CSMS initiated transactions	🕓	✓
C06 - Authorization using local id type	✓	X
Plug and Charge Authorization		
C07 - Authorization using Contract Certificates	✓	✓
C08 - Authorization at EVSE using ISO 15118 External Identification Means (EIM)	✓	✓
GroupId		
C09 - Authorization by GroupId	✓	🕓

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OCPP Interoperability vSECC - vCharM

Use Case	vCharM	vSECC
Authorization Cache		
C10 - Store Authorization Data in the Authorization Cache	X	🕓
C11 - Clear Authorization Data in Authorization Cache	🕓	
C12 - Start Transaction - Cached Id	X	
Local Authorization list		
C13 - Offline Authorization through Local Authorization List	X	🕓
C14 - Online Authorization through Local Authorization List	X	
Offline Authorization		
C15 - Offline Authorization of unknown Id	X	✓
Master pass		
C16 - Stop Transaction with a Master Pass	X	🕓
D. LocalAuthorizationList Management		
D01 - Send Local Authorization List	🕓	🕓
D02 - Get Local List Version		
E. Transactions		
OCPP transaction mechanism		
E01 - Start Transaction Options	✓	✓
E02 - Start Transaction - Cable Plug-in First	✓	✓
E03 - Start Transaction - IdToken First	✓	✓

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OCPP Interoperability vSECC - vCharM

Use Case	vCharM	vSECC
E04 - Transaction started while Charging Station is offline	✓	✓
E05 - Start Transaction - Id not Accepted	✓	✓
E06 - Stop Transaction options	✓	✓
E07 - Transaction locally stopped by IdToken	✓	✓
E08 - Transaction stopped while Charging Station is offline	✓	✓
E09 - When cable disconnected on EV-side: Stop Transaction	✓	✓
E10 - When cable disconnected on EV-side: Suspend Transaction	✓	🕓
E11 - Connection Loss During Transaction	✓	✓
E12 - Inform CSMS of an Offline Occurred Transaction	✓	✓
E13 - Transaction related message not accepted by CSMS	✓	✓
E14 - Check transaction status	🕓	🕓
Interrupting and stopping ISO / IEC 15118 charging		
E15 - End of charging process	✓	✓
F. RemoteControl		
Remote Transaction Control		
F01 - Remote Start Transaction - Cable Plug-in in First	🕓	✓
F02 - Remote Start Transaction - Remote Start First		✓
F03 - Remote Stop Transaction		✓
F04 - Remote Stop ISO / IEC 15118 charging from CSMS		✓

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OCPP Interoperability vSECC - vCharM

Use Case	vCharM	vSECC
Unlock Connector		
F05 - Remotely Unlock Connector	🕓	🕓
Remote Trigger		
F06 - Trigger Message	✓	✓
G. Availability		
G01 - Status Notification	✓	✓
G02 - Heartbeat	✓	✓
G03 - Change Availability EVSE	✓	✓
G04 - Change Availability Charging Station	**X**	✓
G05 - Lock Failure	✓	🕓
H. Reservation		
H01 - Reservation	🕓	🕓
H02 - Cancel Reservation		
H03 - Use a reserved Connector with GroupId		
H04 - Reservation Ended, not used		
I. TariffAndCost		
I01 - Show EV Driver-specific Tariff Information	🕓	🕓
I02 - Show EV Driver Running Total Cost During Charging		
I03 - Show EV Driver Final Total Cost After Charging		

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OCPP Interoperability vSECC - vCharM

Use Case	vCharM	vSECC
I. TariffAndCost		
I04 - Show Fallback Tariff Information		
I05 - Show Fallback Total Cost Message		
I06 - Update Tariff Information During Transaction		
J. MeterValues		
J01 - Sending Meter Values not related to a transaction	✓	
J02 - Sending transaction related Meter Values	✓	✓
ISO / IEC 15118 MeterValue signing		
J03 - Charging Loop with metering information exchange	✓	
K. SmartCharging		
General Smart Charging		
K01 - SetChargingProfile	✓	✓
K02 - Central Smart Charging	✓	✓
K03 - Local Smart Charging	**X**	**X**
K04 - Internal Load Balancing	**X**	**X**
K05 - Remote Start Transaction with Charging Profile	**X**	
K06 - Offline Behavior Smart Charging During Transaction	✓	✓
K07 - Offline Behavior Smart Charging at Start of Transaction	✓	✓
K08 - Get Composite Schedule	**X**	**X**

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OCPP Interoperability vSECC - vCharM

Use Case	vCharM	vSECC
K09 - Get Charging Profiles	X	X
K10 - Clear Charging Profile	X	✓
External Charging Limit based Smart Charging		
K11 - Set / Update External Charging Limit for an ongoing transaction	X	
K12 - Reset / release external charging limit	X	
K13 - Set / update external charging limit (not on a transaction)	X	
K14 - External Charging Limit with Local Controller	X	X
ISO / IEC 15118 based Smart Charging		
K15 - Charging with load leveling based on High Level Communication	✓	
K16 - Renegotiation initiated by CSMS	✓	✓
K17 - Renegotiation initiated by EV	✓	✓
L. FirmwareManagement		
L01 - Secure Firmware Update	✓	
L02 - Non-Secure Firmware Update	✓	✓
L03 - Publish Firmware file on Local Controller	X	X
L04 - Unpublish Firmware file on Local Controller	X	X
M. ISO IEC 15118 CertificateManagement		
M01 - Certificate installation EV	**2023**	
M02 - Certificate Update EV	**2023**	

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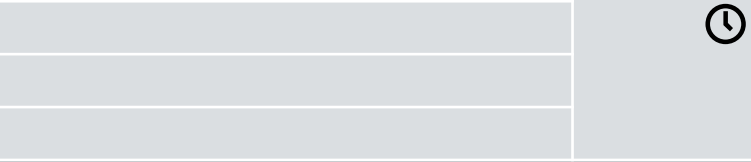
OCPP Interoperability vSECC - vCharM

Use Case	vCharM	vSECC
M03 - Retrieve list of available certificates from a Charging Station	🕓	🕓
M04 - Delete a specific certificate from a Charging Station	✓	✓
M05 - Install CA certificate in a Charging Station	✓	✓
M06 - Get Charging Station Certificate status	🕓	🕓
N. Diagnostics		
Logging		
N01 - Retrieve Log Information	✓	✓
Configure Monitoring		
N02 - Get Monitoring report	✓	🕓
N03 - Set Monitoring Base	🕓	
N04 - Set Variable Monitoring		✓*
N05 - Set Monitoring Level		🕓
N06 - Clear / Remove Monitoring		✓*
Monitoring Events		
N07 - Alert Event	✓	✓*
N08 - Periodic Event	✓	✓*
Customer Information		
N09 - Get Customer Information	**X**	**X**
N10 - Clear Customer Information	**X**	**X**

OCPP Interoperability vSECC - vCharM

Use Case	vCharM	vSECC
O. DisplayMessage		
O01 - Set Message Display		X
O02 - Set Message Display for Transaction		X
O03 - Get All Message Display IDs		X
O04 - Get a Specific Message Display		X
O05 - Clear a Message Display		X
O06 - Replace Message Display		X
P. DataTransfer		
P01 - Data Transfer to the Charging Station	✓	
P02 - Data Transfer to the CSMS	✓	

For more information about Vector
and our products please visit

www.vector.com

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