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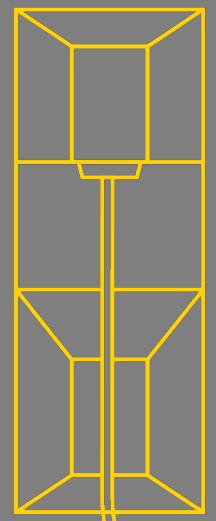
ISO 15118 Charger Communications and Interoperability

California Energy Commission Workshop, November 10, 2021



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Three Dimensions of Interoperability

Standardization and interoperability are critical considerations in the development of public charging infrastructure, in creating positive customer charging experiences with EV drivers, and in supporting competition and innovation in the EV charging product and services market

Primary dimensions of standardization and interoperability:

1 Physical charging port connector interoperability

Level 2:

SAE J1772 (IEC Type 1)

DC Fast Charging:

The North American market has coalesced around the CCS connector; with only legacy vehicles using CHAdeMO. Tesla vehicles have their own connector, but adaptors exist so that they may use other charging ports.

Medium & Heavy Duty:

There are additional standards supporting overhead heavy-duty charging, and developing standards for megawatt-level charging

2 Payment interoperability & driver roaming

Roaming Agreements amongst EV charging network operators allow members of one network to use other networks without having to create a separate account

Open Charge Point Interface ("OCPI") is the primary payment interoperability protocol in North America

Credit/Debit Card payments at public charging stations helps enable payment interoperability for those that are not members of an applicable charging network or without smartphones, and in a number of other situations

Plug and Charge facilitated by EV-EVSE communications represents the next evolution of driver-friendly payment interoperability (see next box)

3 Hardware/software communication interoperability

Open Charge Point Protocol ("OCPP"):

The industry has coalesced around this de-facto standard for communication between the charging station and back-end software. Facilitates switching ability and mitigates stranded asset risk.

OpenADR is the standard often used for communicating smart charging/demand response signals to network operators.

ISO I5118 facilitates EV-EVSE communication and is the protocol many automakers are adopting to support VGI and driver friendly features. This includes "plug and charge", the ability of the vehicle to automatically communicate with the charger over the charging cable to authenticate payment, charging/needs preferences, etc.

ISO 15118 Plans & Challenges

- Greenlots is supporting and implementing ISO 15118-based functionality for our clients globally
  - Plug & Charge for DCFC today, broader capabilities extended to Level 2 in the future
- Primary challenge for Greenlots: a lack of HW-ready charging station models, particularly Level 2
- Industry is making significant strides to address PKI challenges
- Recommend emphasis on moving to -20 as quickly as possible
- Greenlots supports early conformance rebate concept; general acceleration
- Proposal mirrors successful CARB approach for OCPI-based roaming: require the capabilities, enable but not require market to implement
- Needed to support drivers, move beyond early adopter phase, and enable VGI market competition

Thomas Ashley
VP, Policy & Market Development
tom@greenlots.com

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