CharIN e.V. – Empowering the next level of e-mobility

Claas Bracklo, Michael Keller, CharIN e.V., Berlin

Abstract
Under the CharIN umbrella, cross-industry stakeholders like automakers, charging station manufacturers, component suppliers, energy providers, grid operators, and many others continue moving towards interoperable charging, where vehicles, chargers, and software systems work together and to make the user experience reliable, easy, and smooth. CharIN’s holistic approach is not limited to passenger cars. Its international community is comprised of leading global companies representing every link to the e-mobility value chain and multiple experts who have been working together as a team to drive the requirements of charging all kinds of electric vehicles. Besides several further topics and activities, the scope has been extending to Commercial Vehicles and thus, setting requirements and standards for the development of the Megawatt Charging System (MCS). In the close future, the MCS shall also be used to charge other heavy-duty vehicles like e-ferries, ships, and planes.

1. CCS – one system for all: global, cross industry and holistic
As the world’s only open and universal charging system for electric vehicles, the Combined Charging System (CCS) technology and architecture has been enshrined in international standards. Main features of CCS are:

- Interoperability by using ISO15118 also for additional features
- Customer Comfort Features (e.g. Plug & Charge, Automated Conductive Charging)
- Creation of a fair data ecosystem (e.g. PKI for Plug & Charge)
- Extension to Megawatt Charging System (MCS) for charging > 2 MW
- Comprehensive High Power Charging (HPC) stations with quick recharging
- Enabling of environment for easy qualified infrastructure setup
- Intelligent Load Management including the vehicle battery in the grid
- Vehicle to Grid (V2G) Management

2. High Power Charging (HPC) to shorten charging times
Charging infrastructure plays a pivotal role for the market uptake of EVs, and new technological developments need to be integrated quickly in order to shorten charging times.
The preferred charging communication standard is ISO 15118, especially for high power charging. Chargers and EVs should nonetheless as much as possible be forward and backward compatible supporting both DIN SPEC 70121:2014 and ISO 15118 ED1.

Fig. 1: Grid Integration Levels

3. Megawatt Charging System (MCS) for large battery electric vehicles

CharIN wants to help the industry to create a new solution for charging their electric heavy-duty vehicles within a reasonable time. Therefore, CharIN initiated the Task Force Megawatt Charging System (MCS) to comply a holistic system approach based on the combined charging system CCS. The working group works now represents the whole value chain for the industry segment which ensures that all perspectives are considered. As new requirements from the industry were discovered also light electric airplanes and marine applications became a relevant field of this extended application.

In September 2020, the MCS group did the first prototype testing at NREL’s facilities evaluating the fit and ergonomics, the easy connection and disconnection and the thermal performance of the connectors and inlets. Further tests for this year are planed together with the publication of first technical details.
4. About CharIN e. V.

The Charging Interface Initiative e. V. - abbreviated to CharIN e. V. – the leading global association with more than 230 members dedicated to promote interoperability based on the Combined Charging System (CCS) as the global standard for charging vehicles of all kinds. 18 out of the top 20 car brands are already represented within CharIN, as well as the top five semiconductor companies and the leading EV charging station manufacturers. Regional offices in Germany, Brussels, Hongkong, China, India, Japan, Korea and the US drive the positive membership development by organizing calls, presentations at events, workshops and member meetings in the international context, but also with respect to local requirements of the specific areas.
References

