





On IEEE 1901 Profile Green PHY as Technology for Charging Communication for Electric Vehicles

German industry publishing this statement sees an urgent need to safeguard future availability of hardware components for electric vehicles.

Communication is essential for charging electric vehicles.

The driving requirement for communication technologies is the seamless integration of electric vehicles into existing and emerging charging infrastructure. Electric vehicles will have to be integrated into the smart grid as the future paradigm of power networks and economics. Particular objectives for communication are:

- 1. Controlling charging procedure by infrastructure (energy supplier and grid operator) and vehicle
- 2. Providing convenient charging for all customers, e.g. to achieve reliable charging in absence of driver
- 3. Enabling certified payment and billing systems
- 4. Safeguarding high-voltage safety and personal privacy
- 5. Ensuring interoperability of certified value-adding vehicle-to-grid accessories.

Communication technology must be general and future-proof.

An efficient solution is a precondition for the successful market entry of electric vehicles. The communication interface shall be established via the charging connector. Consequently, a unique communication paradigm shall be applied to all existing charging connectors which support all modes of AC and DC charging. Additional RFID or wireless communication shall not be used to reduce hardware costs and complexity.

Standardization of communication is done in Joint Working Group of ISO and IEC.

The standard for charging communication ISO/IEC15118 is currently developed in an international cooperation. The automotive industry is actively contributing to and pushing for standards. Further standardization activities like SAE J2847/2931 set of documents are also closely followed by the vehicle manufacturers. These standards will pave the way to electric vehicles to be charged from the electrical grid with the performance desired by customers. The standards will make electric vehicles compatible with growing smart grid applications. The international standard is expected to be published in March 2013.

German stakeholders select PLC IEEE1901 Profile Green PHY as communication technology.

A key objective for a global standard is the selection of a common communication technology for the physical & data link layer. Several options are currently identified and discussed in ISO/IEC 15118-3 and SAE J2931. After intense case studies and tests, Germans stakeholders in e-mobility have decided to support IEEE1901 Profile Green PHY on inband as the most promising technology. The vehicle manufacturers will push together for its inclusion in the set of relevant standards.

PLC hardware qualified for automotive use is urgently needed.

The automotive industry greatly appreciates all efforts being made by semiconductor manufacturers developing chipsets according to the IEEE1901 Profile Green PHY standard and meeting automotive quality requirements. Evaluation boards with products implementing IEEE1901 Profile Green PHY are needed short notice to establish prototypical implementations of charging systems according to the development processes of Electric Vehicles. In parallel to setting up prototype systems, chipsets and their production must be qualified according to AEC Q100. This set of quality requirements ensures that qualified products meet the expectations to environmental and lifetime durability. Along with rising numbers of electric vehicles, mass production of chipsets needs to be ramped up to address the needs of the automotive industry.