NEW: Smart Charging Solution
Developing and testing intelligent charging technologies

Highlights

- Support of all common charging standards, such as ISO 15118, DIN SPEC 70121, IEC 61851-1, CHAdeMO, and GB/T
- High degree of customization as well as fault injection and logging capabilities
- Seamless workflow with Simulink®

Application Areas
The new Smart Charging Solution is a key solution for developing and testing technologies involved in the electric vehicle charging process. The combination of hardware and software components offers comprehensive test possibilities. It supports all common charging communication standards, such as ISO 15118, DIN SPEC 70121, IEC 61851-1, CHAdeMO, and GB/T, and can be easily integrated in your test setup. Thanks to its high flexibility, the Smart Charging Solution offers versatile application options, including the simulation of electric vehicle supply equipment (EVSE) as well as the simulation, test, and development of onboard chargers. In this way, it supports both manufacturers of electric vehicles and manufacturers of charging stations in developing and testing smart charging technologies.

Key Benefits

- ISO 15118 and DIN 70121 powerline communication
- CHAdeMO and GB/T support
- Isolated interface between the HIL simulator and the ECU
- Interfaces for all common charging plugs (e.g., Type 1, Type 2, CCS1, CCS2, GB/T, CHAdeMO)
- Support of AC and DC charging
- CAN FD interface for easy integration
- Rapid control prototyping (RCP) as well as hardware-in-the-loop (HIL) simulation
- Monitoring and manipulation of power-line communication used, e.g., for pairing mechanism (Signal Level Attenuation Characterization, SLAC)
- Simulation of errors during communication

Simulating Electric Vehicle Supply Equipment
- Test real electric vehicles and onboard chargers by connecting them to simulated charging stations supporting different standards
- Test various ECUs and power electronics components involved in the charging process

Hardware and Software
The Smart Charging Solution includes hardware and software and can be easily integrated into your test setup. For more information on the individual components, please see the next page.

1) CHAdeMO and GB/T communication will be available with a later Release.
**DS5366 Smart Charging Interface**

The hardware component of the Smart Charging Solution, the DS5366 Smart Charging Interface, comes as an isolated interface between the hardware-in-the-loop (HIL) simulator and the electronic control unit (ECU). It provides a CAN FD interface for connecting to the HIL simulator as well as USB and Ethernet interfaces for protocol tracing and data logging.

**Technical Details**

- Internal 4 GB SD card for customer settings
- Host interface
  - 1 Mbit/s CAN FD
  - USB logging on connected PC
  - Ethernet raw data
  - Input for custom PWM voltage
  - Input for custom PWM impedance resistor
- Target interface
  - Control pilot (CP), proximity pilot (PP), protective earth (PE)
  - 2 x relay output for power switching and user applications
- CAN FD interface
  - Monitoring of SLAC and vehicle-to-grid (V2G) messages via CAN
  - Dynamic access to control messages of the DS5366 Smart Charging Interface
- Power supply
  - 8 ... 30 V DC input voltage
  - ~ 6 W power consumption

**Functionality Overview**

- Simulink model
  - Behavior model of a charging station
  - User interface for connecting and simulating power electronics components
  - Open model for all communication standards that can be coded for different real-time systems
  - Suitable interface for ASM Electric Components
- ControlDesk layouts
  - Overview layout including electrical information as well as information on the communication status
  - Detailed configuration layout including timing manipulation
  - Status and device information
  - Warnings and error counter
- Automatic Mode and Manipulation Mode
  - Logging of all request and response messages on CAN FD
  - Override mechanism for parameter manipulations
  - Possibility to connect power electronics components
  - V2G data manipulation
  - Timing manipulation by restraining V2G response messages on CAN FD

**Smart Charging Interface Software**

The Smart Charging Interface Software includes a Simulink® model, ControlDesk layouts, and a DBC file that describes the CAN FD communication. The Simulink model supports all common charging communication standards. It includes a user interface for parametrization and allows for the connection and simulation of power electronics components. By using the ControlDesk layouts, you get an overview of all the relevant electrical information, the messages involved in the charging communication, and the communication status. You can also use the layout for configuration purposes, e.g., for parametrization as well as electrical and timing manipulation.