Connecting EVs to the Grid: An Introduction to the IEC 61850 Substation Automation Standard

SPEAKERS

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iTEC2023

About Us:

ITEC is aimed at helping the industry in the transition from conventional vehicles to advanced electrified vehicles. The conference is focused on components, systems, standards, and grid interface technologies, related to efficient power conversion for all types of electrified transportation, including electric vehicles, hybrid electric vehicles, and plug-in hybrid electric vehicles (EVs, HEVs, and PHEVs) as well as heavy-duty, rail, and off-road vehicles and airplanes and ships.

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SUMMARY

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ABSTRACT

The subject of the ITEC 2023 conference is Transportation Electrification, but the energy required for the EVs comes from the grid. Therefore, the way in which we communicate with the grid is very important. There are many communication standards related to EV charging.

These include plug connections such as Type 1, Type 2, CCS, and CHAdeMO. Another standard used for EV charging is OCPP for connecting a charging network to an EV charger. Others focus on the EV-to-EV end user. However, there is one important power system standard that often gets overlooked: The IEC 61850 Substation Automation standard. The IEC 61850 standard focuses on how substation devices communicate with each other.

There are many protocols for grid communication, but there has not been a global standard until the IEC 61850 standard was created. The purpose of this tutorial is to provide participants with an introduction to the IEC 61850 communication standard, so that they can better evaluate it and determine if it is a viable option for their future Transportation Electrification work. IEC 61850 has communication extensions for EVs, DERs, and BESS. These extensions will be discussed along with EV charging protocols and interfaces including OCPP and IEC 61851.