China roadshow 2025

Title: CAN XL Testing: From implementation to system-wide integration

Speaker: Patrick Isensee (C&S)

Abstract: CAN XL addresses the increasing bandwidth requirements of modern automotive systems. With its easy adaptation and the reusability of the existing CAN protocol – the most prevalent network protocol in vehicles – the flexible data rate and significantly larger payload offer an effective solution to the ever-increasing flow of information. Nonetheless, the protocol introduces specific challenges for designers:

1. Different implementations raise concerns regarding their interoperability. Experience with established automotive bus systems such as CAN, LIN, and FlexRay has demonstrated that the seamless operation of devices from various manufacturers under diverse conditions cannot be taken for granted. Conformance testing is key to ensuring a basic level of interoperability among devices from different suppliers within a system environment.
2. The dynamic behaviour of a system cannot be predicted by manual calculations. This forces designers to rely on simulation and measurement to analyze the network for robust design and to examine critical effects that evolve as CAN technology progresses. While propagation delay was a limiting factor for high- speed CAN networks, this has significantly changed with CAN FD and SIC. For CAN XL, it is essential to assess the effects of new transceiver technologies and protocol modifications, such as the new driver stage, bus levels, stuffing rule or the transition between SIC and FAST modes.

This presentation will outline various concepts, challenges, and solutions related to CAN XL implementations, with a focus on achieving interoperability, enhancing signal quality, and ensuring reliable communication with precise outcomes, even under worst-case conditions.