

Ringling suppression in CAN FD networks

CAN in Automation (CiA) has released the CiA 601-4 draft standard proposal specifying the ringling suppression in CAN FD star and hybrid topology networks.

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Prototype of a CAN high-speed transceiver with ringling suppression capability as specified in CiA 601-4 (Photo: Denso)

THE BASIC IDEA IS SIMPLE: The specified circuitry changes the overall impedance for a short time after the dominant-to-recessive state change. The duration depends on the chosen data-phase bit-rate. In CAN FD networks using single-star or multiple stars or hybrid (star plus linear bus) technologies, the ringling on the bus-lines limits the maximal possible data-phase bit-rate. Therefore, the ringling suppression is very important.

Most of the carmakers will migrate to CAN FD networks within the next few years. CAN FD standardized internationally in ISO 11898-1:2015 supports higher bit-rates in a part of the data frame. Additionally, the improved data link layer protocol features payloads of up to 64 byte. The Classical CAN protocol was limited to an 8-byte data field. Because many legacy CAN networks in automobiles don't use bus line topologies, the proposed ringling suppression circuitry (RSC) is an interesting option for the carmakers. Denso the originator of the RSC technology holds some patents, but is willing to grant licenses on fair, reasonable, and non-discriminatory (FRAND) conditions. First samples of the RSC by Denso were tested during the CAN FD plug-fest in 2015 organized by CiA.

The CiA 601-4 specification is released CiA internally, but interested parties may request a personalized copy from CiA headquarters in Germany. The ringling suppression circuitry specified in this document can be implemented in ISO 11898-2 compliant transceivers or implemented as a stand-alone circuitry. Denso presented the RSC technology at the international CAN Conference 2015 in Vienna. The paper is documented in the [iCC proceedings](#) available from CiA office.