

2016

CAN FD

Internationally standardized in ISO 11898-1



*The next generation CAN data link layer:
Faster than 1 Mbit/s and up to 64 byte payload*

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The CAN FD data link protocol overcomes the limitations of the Classical CAN protocol. CAN FD allows in the data-phase part of the data frame a transmission rate higher than 1 Mbit/s. The automotive industry will use 5 Mbit/s for software download using linear topologies, and 2 Mbit/s for star and hybrid networks. Possibly, up to 8 Mbit/s can be achieved in linear networks. Additionally, the data-field has been enlarged to up to 64 byte. The Classical CAN is limited to 8 byte. Both improvements lead to significant higher throughputs.

Several chipmakers have implemented the CAN FD protocol as standardized in ISO 11898-1:2015.

Transceiver chips supporting bit-rates up to 2 Mbit/s and higher have been introduced by several manufacturers. Additionally, toolmakers have launched bus analyzers, oscilloscopes, and other tools supporting ISO CAN FD. The ISO 11898-2 high-speed transceiver standard is also under review allowing bit-rates higher than 1 Mbit/s. The reviewed standard will specify transceiver parameters for 2 Mbit/s and 5 Mbit/s. It will be merged with the ISO 11898-5 (low-power mode) and ISO 11898-6 (selective wake-up mode) standards.

Standardized higher-layer protocols will be updated, too. The reviewed ISO transport protocol (TP) standardized in ISO 15765-2 is already under publication. The CiA 301 version 5.0 will support CAN FD. The CANopen FD roadmap will be released in October 2016. The CANopen profiles will also be reviewed. CiA's Interest Group (IG) Commercial Vehicle develops a J1939-based application layer (CiA 602 series) describing the mapping of J1939-21 compliant messages to the CAN FD data frames with up to 64 byte in the data field.

The carmakers are highly committed to CAN FD. Other CAN markets, in particular mobile working machines and embedded control systems will adopt CANopen FD. Also motion control applications in industrial automation can benefit from the higher speed and the larger payload. The airborne industry develops within the SAE International association the Arinc 825 specification supporting CAN FD.

The early bird catches the worm ..

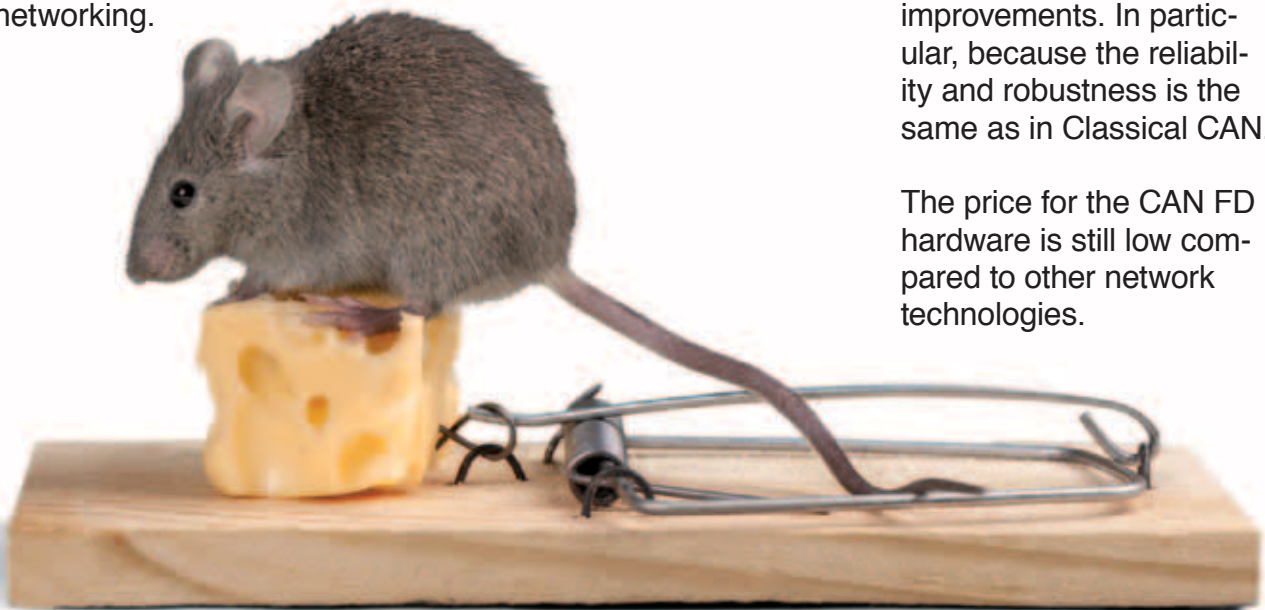
.. *but the second mouse gets the cheese!*

Device designers can start to pre-develop CAN FD connectable products, right now. CiA's IG CAN FD develops design recommendations (CiA 601 series). Part 1 describes the CAN FD interface of devices. Part 4 specifies a ringing suppression circuitry. Both parts are already released CiA internally. Non-members may request a personalized copy from CiA office. SAE international develops also CAN FD systems design recommendations in J2284-4 for 2-Mbit/s data-phase bit-rates and in J2284 for 5-Mbit/s dedicated for in-vehicle networking.

CiA's IG CAN FD organizes plug fests. In these worldwide events, the participants proof the interoperability of CAN FD products in different network systems. The networks differ regarding topology, bit-timings, and higher-layer protocols. ISO standardizes also the conformance test plan for the CAN FD data link layer protocol (ISO 16845-1) and for high-speed transceivers (ISO 16845-2).

The automotive industry will substitute step-by-step all Classical CAN networks by CAN FD. This allows faster download of still increasing application software packages. In addition, CAN FD allows also higher throughput in normal operation. The longer payload can be used for more complex signals. It enables also the implementation of functional safety and security mechanism. Non-automotive users have the same benefits: higher throughput and more data bytes per message. In particular, more complex devices such as motion controllers benefit from these improvements. In particular, because the reliability and robustness is the same as in Classical CAN.

The price for the CAN FD hardware is still low compared to other network technologies.



We keep you informed!

CiA supports you with seminars, in-house trainings, publications, specifications and recommendations as well as plug fests.

CiA employees are active in standardization bodies. They share their first-hand information with seminar participants. CiA organizes also CAN FD plug fests, in which members proof the interoperability of their CAN FD products. The next plug fests are scheduled on April 6 and April 7 in Detroit as well as on June 2 in Nuremberg. For details please contact CiA office (headquarters@can-cia.org).

Seminars

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|------------|--------------------------|----------------|
| 2016-03-15 | CAN/CAN FD for newcomers | Nuremberg (DE) |
| 2016-06-08 | CAN FD in detail | Nuremberg (DE) |



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