CAN XL 2024

The third CAN generation

- Up to 20 Mbit/s
- Up to 2048-byte data field
- CANsec security at line-speed
- Ethernet frames embedded in CAN XL frames
- Supported by Autosar specifications
**Up to 20 Mbit/s**

Originally, CAN XL has been developed for high-volume passenger cars to enable zonal network architectures. Those architectures allow the reduction of wiring harnesses, which saves weight. CAN XL is suitable to run several CAN CC and even CAN FD networks on one single physical network. This is supported by new protocol functions. Using CAN SIC XL transceivers, data bit rates up to 20 Mbit/s are possible.

**CANsec and frame fragmentation**

The optional CANsec security protocol is a building block to meet future cybersecurity requirements. The optional CAN XL frame fragmentation improves the real-time demands in control applications.

**Robust and reliable**

CAN XL communication is at least as robust and reliable as CAN CC and CAN FD. The probability of undetected errors is even lower, by means of using two CRCs in the frame. The error detection performance has been evaluated independently by two universities.

**Key features**

- Up to 20 Mbit/s data phase bit rate
- 1-byte to 2048-byte data field size
- CANsec security protocol at line-speed
- Support of virtual CAN networks
- 11-bit priority identifier intended for bus access
- 32-bit acceptance field intended for addressing
- Simultaneous support of multiple higher-layer protocols
**Vehicles and non-vehicles**

In automotive applications and heavy-duty commercial vehicles, CAN XL fills the gap between legacy CAN networks (CAN CC and CAN FD) and high-performance network solutions. In non-automotive applications, CAN XL provides sufficient payload capability to be used as backbone network and to support functional safety and cybersecurity.

**Chips and tools**

Different micro-controller families provide CAN XL protocol controllers. Several chipmakers announced CAN SIC (signal improvement capability) XL transceivers. These integrated circuits will be available for reasonable prices as for CAN FD. Some vendors already offer hardware and software tools including oscilloscopes.

**Autosar and CiA**

The two organizations cooperate in the development of specifications. The latest Autosar specifications support the new CAN XL features like longer payload as well as CAN CC, CAN FD, and Ethernet frame mapping.

**CAN XL status**

- ISO 11898-1 specifies data link layer protocol
- ISO 11898-2 specifies CAN SIC XL transceiver
- Conformance test plans under development
- IP available for ASIC/FPGA and MCU/SoC
- MCU “samples” with CAN XL available
- CiA website provides latest news
**SIG CAN XL**

In the CiA special interest group (SIG) CAN XL, CiA members develop and maintain the CAN XL ecosystem. This covers the data link and the physical layer, as well as higher-layer functions. Additionally, the SIG takes care of related conformance test plans.

**MG CAN XL**

In the CiA marketing group (MG) CAN XL, automakers, suppliers and semiconductor manufacturers develop, initiate, and coordinate joint marketing initiatives to pave CAN XL the road to future application fields.

**CiA plugfests**

CAN XL plugfests allow the verification of CAN XL features to increase the interoperability of CAN XL implementations. Additionally, they are a good opportunity for social networking. The participants learn from each other and together they solve interoperability issues.