

Standards and specifications



This regular column provides news from standardization bodies and nonprofit associations regarding CAN-related documents. Covered are also recommended practices, application notes, implementation guidelines, technical reports, and open-source projects.

Open-source telematics for commercial vehicles

Cummins has announced a collaboration with Bosch Global Software and KPIT to launch Eclipse CANought, an open-source project for commercial vehicle telematics. It is part of the Eclipse Software Defined Vehicle project.

“Cummins is partnering with two industry experts on this project, Bosch Global Software and KPIT, two companies that have extensive expertise in vehicle telematics and CAN communications,” said Brad Sutton, working with Cummins. Eclipse CANought enables secure OTA (over-the-air) software updates to CAN-connected ECUs (electronic control units). It supports J1939, a higher-layer protocol for heavy-duty vehicles developed by SAE.

“This collaboration among industry leaders is just one more example of how the open-source model fuels innovation in the automotive sector, making advancements accessible industry-wide. CANought is particularly exciting as it merges open-source collaboration with established industry standards and architectures such as CAN and SAE J1939, accelerating the development of Software Defined Vehicle applications,” stated Mike Milinkovich, executive director at the Eclipse Foundation. Eclipse CANought complements an existing project, Eclipse Kanto, which provides a hardware-agnostic solution for running containerized applications across a variety of telematics hardware.

“We believe that coordinated software updates are crucial for the commercial vehicle industry as more countries implement new regulations for cyber security. This new collaboration will enable customers to more effectively deploy software updates to all of the vehicle systems simultaneously,” said Sven Kappel from ETAS, Bosch daughter company. “By establishing standard interfaces, our update systems can easily connect with OEM and Tier 1 ECU software update mechanisms.”

Over the next few months, Cummins, Bosch BGSW, ETAS, and KPIT will continue to contribute to the Eclipse CANought project. These contributions will be analyzed and

improved by the larger Eclipse SDV community as they are made production-ready.

“KPIT is proud to be a trusted software partner to Cummins for over two decades. We are delighted to bring the power of KPIT’s remote diagnostics and OTA technology solutions to Cummins products deployed in commercial vehicles. This open-source, standardized solution, backed by Eclipse Foundation, will be a game changer in the experience for engineering and service professionals in the commercial vehicle space” said Anup Sable from KPIT. In spring 2025, Eclipse Kanto and Eclipse CANought are available for integration into projects. *hz*

DIN 14700 workshop

The online workshop was well participated by about 20 attendees. Speakers from CiA, DIN, Haensch, Rosenbauer, and Ziegler gave an overview about the DIN 14700 monolithic document, which is currently under publication. The German standard is written in English language and will substitute the legacy multi-part DIN 14700 standard written in German language. In order to internationalize this standard, DIN is willing to submit this document to ISO.

DIN 14700 specifies a fire-fighting truck host controller and dedicated fire-fighting equipment, so-called FFUs (fire-fighting units). This includes warning signal units, frequency inverter units, water cannon units, light mast units, and other units. The used CAN-based network complies with CANopen CC (classic) communication services and protocols as specified in CiA 301/EN 50325-4.

During the workshop, new functions – especially for telematics and for a second display unit for the body application – were discussed. In order to avoid extra protocol converters (gateway units), the option of in-vehicle gateway units (IGUs) based on a CANopen application layer were presented. IGUs are specified in DIN 4630 (also available in English language). This German standard has been already submitted to ISO and is currently under revision (ISO 25200). *hz*

ISO 16845 series in revision

The conformance test plans for the CAN data link layer and the physical coding sublayer (ISO 16845-1) and for the CAN physical medium attachment sublayer (ISO 16845-2) are under revision. They standardize test cases for ISO 11898-1 (CAN protocol controller) respectively ISO 11898-2 (CAN transceiver) implementations. Project leader (editor) is Christoph Wosnitza from the C&S Group test-house, Germany. The revision of these documents is a task of the ISO/TC 22/SC 31/WG 3 chaired by Holger Zeltwanger, the CiA Managing Director.

The ISO 16845-1 document covers all three CAN protocol variants: CAN CC (classic), the legacy CAN data link layer introduced beginning of the 90s, CAN FD (flexible data rate), launched mid of the 2010s, and CAN XL (extended data-field length), originally specified in CiA 610-1. Additionally, this standard provides test cases for CAN FD light responder implementations. The CiA task force "ISO 16845-1" supports the revision of the ISO conformance test plan by means of submitting joint comments discussed and prepared by CiA members and interested members of the ISO/TC 22/SC 31/WG 3 experts.

The ISO 16845-2 document is related to following CAN transceiver implementations: CAN HS (high-speed),

CAN FD, CAN SIC (signal improvement capability), and CAN SIC XL. The CAN SIC XL approach features two modes: the SIC mode and the FAST mode. In FAST mode, bit rates up to 20 Mbit/s can be achieved, depending on the selected network topology and chosen electro-mechanical components such as cables and connectors. hz

Brief news

- ◆ **CiA 702:** CiA has released the CiA 702 document specifying the usage of LLS (layer setting services) FD services and protocols in CANopen CC (classic) networks. It specifies the mapping to CAN CC data frames, enabling a faster detection of unknown LSS addresses.
- ◆ **CiA 910-1/2:** The recently released CiA 910-1 (general terms and use cases) and CiA 910-2 (PMA simulation model requirements) documents specify a set of requirements for simulation models. This enables the development of simulation tools for networks based on CAN FD, CAN SIC, and CAN SIC XL transceivers, which provide comparable results. The simulation model for the PMD (physical-medium dependent) sublayer (CiA 910-3) is still under development.
- ◆ **ISO 11992-1:** On Semiconductor has qualified its [NCV7390 transceiver](#), which complies with ISO 11992-1. Now, the product is available in production volume.
- ◆ **ISO 11992 series:** Part 2 (brake and running gear parameters) is under revision. Besides some missing J1939 parameter groups, there are some new feature requests in respect to e-trailer applications.
- ◆ **ISO 11783-3:** This document dedicated for control networks in agriculture machinery, has been revised. It specifies application, network, and transport layers and the mapping to CAN CC (classic) data frames in extended format. It will be submitted for DIS (Draft International Standard) ballot, soon.
- ◆ **ISO 16844 series:** The tachograph standard for commercial vehicles is going to be revised. There are some new feature requests and some pending comments. Part 7 specifies some J1939 parameters. ISO/TC 22/SC 31/WG 4 is responsible to update the documents.
- ◆ **ISO 25200:** ISO/TC 22/SC 31/WG 4 has started to develop a body application network based on the DIN 4630 standard. Project leader (editor) is Richard Moser (Palfinger). The standard under development addresses body builders as well as truck and trailer manufacturers. It is intended to provide a standardized interface to telematic systems, too.
- ◆ **SAE J1939/13:** The off-board diagnostic connector specification has been updated in 2024. The defined diagnostic connectors support connection to the twisted shielded pair media (SAE J1939/11), the unshielded twisted pair (SAE J1939/15), the twisted pair (SAE J1939/14), and the twisted unshielded quad media (ISO 11783-2).
- ◆ **SAE J1939/16:** The last year updated document specifies a process enabling devices to detect automatically the bit rate of a CAN CC network as specified in SAE J1939/11, SAE J1939/14, or SAE J1939/15. These networks support Classical Base Frame Format (CBFF) and Classical Extended Frame Format (CEFF), as standardized in ISO 11898-1. Automatic bit-rate detection in a CAN FD network is not in the scope, as SAE J1939-17 is currently the J1939 CAN FD physical layer option, which specifies only one bit rate combination (500 kbit/s and 2 Mbit/s). hz